THE THEORY OF BANK RISK TAKING AND COMPETITION: A STUDY OF YES BANK

Thesis Submitted to

CMJ UNIVERSITY

In partial fulfillment for the award of the Degree of

DOCTOR OF PHILOSOPHY

IN

MANAGEMENT

By

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SHILLONG, MEGHALAYA, INDIA- 793003

DECEMBER - 2012

DECLARATION

This is to certify that the Thesis entitled **"THE THEORY OF BANK RISK TAKING AND COMPETITION: A STUDY OF YES BANK"** submitted to **CMJ UNIVERSITY**, is a partial fulfillment for the award of the Degree of **Doctor of Philosophy in Management** is my unique work under the supervision of **Dr. Nimitha Khanna, Director, Isara Institute, New Delhi.** The thesis has not been submitted before for the award of any degree, diploma or similar title of this or any other University.

Place: Shillong (Meghalaya) **(MERCY JOHN)**

Date: 2012 **(Regd.No.80187710109363)**

CERTIFICATE

This is to certify that the thesis entitled **"THE THEORY OF BANK RISK TAKING AND COMPETITION: A STUDY OF YES BANK"** submitted to CMJ University, Shillong, Meghalaya, India by **Mercy John,** for the award of **Doctor of Philosophy in Management** is a record of research work done under my supervision and guidance. This thesis has reached the standards fulfilling the requirements of the regulations for the Degree and it was not previously formed the basis for any other degree or diploma and I additionally affirm that the Thesis speaks to an autonomous work with respect to the Candidate.

Place: Shillong (Meghalaya) **(DR. NIMITHA KHANNA)**

Date: 2012 **Research Supervisor**

Acknowledgements

Foremost, I would like to express my sincere and whole hearted thanks to my beloved Research Supervisor **Dr. Nimitha Khanna, Director, Isara Institute, New Delhi, India** for her consistent consolation in the indictment of this investigation and in the preparation of this Thesis. I am extremely grateful to her for her sharp and individual intrigue, valuable feedback, and capable direction or more but for her convenient guidance with regard to mine exploration and the innovation of research paper in universal gathering.

I owe a commitment of gratefulness to all Teaching and Non-Teaching staff in the Department of Management CMJ University, for their moral help and encouragement and my grateful because of authorities of Libraries of CMJ University, Shillong, Meghalaya, India.

I would like to express my sincere and whole hearted thanks to **Dr. Pawan Sharma, Professor, Department of Commerce, and University of Delhi**, **India** for his consistent consolation in the indictment of this investigation and in the preparation of this Thesis.

I would like to give my special thanks to Mr. Dinesh Kumar, Director, Delhi Institute of Management Technology, New Delhi for his strenuous efforts to collect data and information support and infectious enthusiasm have guided me throughout my research work.

I would like to thank to my parents for their blessings and also thank to my husband for his full support and encouragement.

Finally, I obliged to the authorities of the **CMJ University, Shillong, Meghalaya, India,** for providing me an opportunity and necessary facilities for carrying out this research work.

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ABSTRACT

Credit risk has always been a primary concern for financial services institutions but it is not always been very effectively managed. Credit risk is loss due to a party in an agreement not meeting its contractual financial obligation in a timely manner. RBI definition of credit risk Possibility of losses associated with decline in the credit quality of borrowers or counterparties. Default due to inability or unwillingness of a customer or counterparty to meet commitments in relation to lending, trading, settlement and other financial transactions. Therefore, the main objective of the study on the concept of credit risk management policy of Yes Bank and credit risk management strategy in the Indian banking sector. The financial crisis that started in 2007 exposed the weaknesses of existing risk management systems among financial services institutions. There were shortcomings in the way many different firms of all sizes and regions were managing their credit risk. This was especially highlighted by complex and innovative products like mortgage-backed securities and collateralized debt obligations. Many firms had considerable exposure to these products without understanding the inherent risk. This resulted in huge losses as the prices of their investments fell. It also had a ripple effect as some of their counterparties, including large firms like Lehman Brothers, filed for bankruptcy or came close to, doing so and the banking policy was primarily influenced by the economic planning strategy formulated under different five- year plans where in banks were projected mainly as the provider of capital to various tasks and projects envisaged in the plans by suitable resource mobilization. Furthermore, under several sponsored government schemes in which banks were required to disburse soft and easy loans and financial assistance to poor and less developed sections of the augment in their income generation capability without proper and adequate security. Thus, credit risk is the risk that a counter party may fail to pay out on a deal when it is supposed to and counterparties that may cause a credit risk range from individuals to corporate firms to sovereign governments.

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INTRODUCTION

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CHAPTER - 1

INTRODUCTION

India's banking sector is growing at a fast pace. India has become one of the most preferred banking destinations in the world. The reasons are numerous: the economy is growing at a rate of 8%, Bank credit is growing at 30% per annum and there is an ever-expanding middle class of between 250 and 300 million people (larger than the population of the US) in need of financial services. All this enables double –digit returns on most asset classes which is not so in a majority of other countries. Foreign banks in India achieving a return on assets (ROA) of 3%, their keen interest in expanding their business is understandable –even more so when compared with the measly 1% average ROA for the Top 1000 banks in the world.

The last decade has witnessed major changes in the financial sector: new banks, new financial institutions, new instruments, new windows and new opportunities and along with all these new challenges. While deregulation has opened up new visitors for banks to augment revenues, it has entailed greater competition and consequently greater risks. Cross-border flows and entry of new products, particularly derivative instruments, have impacted significantly on the domestic banking sector, forcing banks to adjust the product mix as also to effect rapid changes in their processes and operations in order to remain competitive in the globalize environment.

What next? Well one does not need to be a great visionary to figure out that we are at the door steps of a new era of banking. With recent measures announced by the Government and the Reserve Bank of India for opening up India's banking sector and implementing Basel –II norms, it will be a challenging time for the concerned parties to cope up with the new rules of the game. The domestic banks may face lots of competition from the new entrants i.e. the foreign banks in the retail front. We have to wait and see whether there lies any scope for consolidation or whether the answer lies in isolation. The flip side – the international banks too would be finding themselves in an alien land.

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Managing risk is increasingly becoming the single most important issue for regulators and financial institutions. These institutions have over the years recognized the cost of ignoring risk. However growing research and improvements in information technology have improved the measurement and management of risk. Capital adequacy of a bank has become an important benchmark to assess its financial soundness and strength. The new Basel Accord will allow banks and bank supervisors to evaluate properly the various risks that banks face and realign regulatory capital more closely with underlying risks. The accord has, as an underlying principle the reliance on the market to assess the riskiness of banks. This translates into an increased focus on transparency and market disclosure, critical information describing the risk profile, capital structure and capital adequacy. But is the time ripe for us to adopt the new norms? Are we ready for it? How easy or difficult would it be to realign all their process? Where will banks raise their required capitals from? Well, these are just a few of the many questions that we all have in our minds. Taking the banking industry to the heights of excellence, especially in the face of the afore detailed emerging realties, will require a combination of new technologies, better processes of credit and risk appraisal, treasury management, product diversification, internal control and external regulations. The role of information's processing in bank intermediation is a crucial input. The bank has access to different types of information in order to manage risk through capital allocation for Value at Risk coverage. Hard information, contained in balance sheet data and produced with credit scoring, is quantitative and verifiable. Soft information, produced within a bank relationship, is qualitative and non-verifiable therefore manipulated, but produces more precise estimation of the debtor's quality. In this article, we investigate the impact of the information's type on credit risk management in a principal agent frame work with moral hazard with hidden information. The results show that access to soft information allows the banker to decrease the capital allocation for VAR coverage. In a principal –agent model with moral hazard with hidden information where a bank requires information on assets return in order to manage credit risk through equity allocation for VAR coverage, we show that using additional soft information allows to economize equity, thanks to soft information's higher precision. However, this type of information being not verifiable, it

requires to implement a particular wage scheme in order to avoid manipulation by the credit officer.

Today, maintaining and improving long-term financial health is the name of the game. To satisfy shareholders, positive cash flow-combined with prudent investment, balanced growth and cost control- is absolutely essential. Enterprise –wide customer management practices and policies have never been more critical. With customer churn on the rise, the drive for market share is no longer the sole business objective. In many organizations, the number of accounts in collections is increasing, resulting in higher operational costs. Rising net bad debt, fraud, write offs and increasing number of days sales outstanding (DSO) are eroding margins. The truth is, all customers are not the same, and a company's organizational structure and customer strategies and procedures need to reflect these differences. The key to success is acquiring profitable, high –value customers and retaining them for the long term.

Organizations must strike the balance between risk and reward. Risk management – balancing profit potential and customer service with the risk involved in extending credit to a customer life cycle. A credit policy that is too stringent causes customer relationships to suffer; one that is too slack causes profits to suffer.

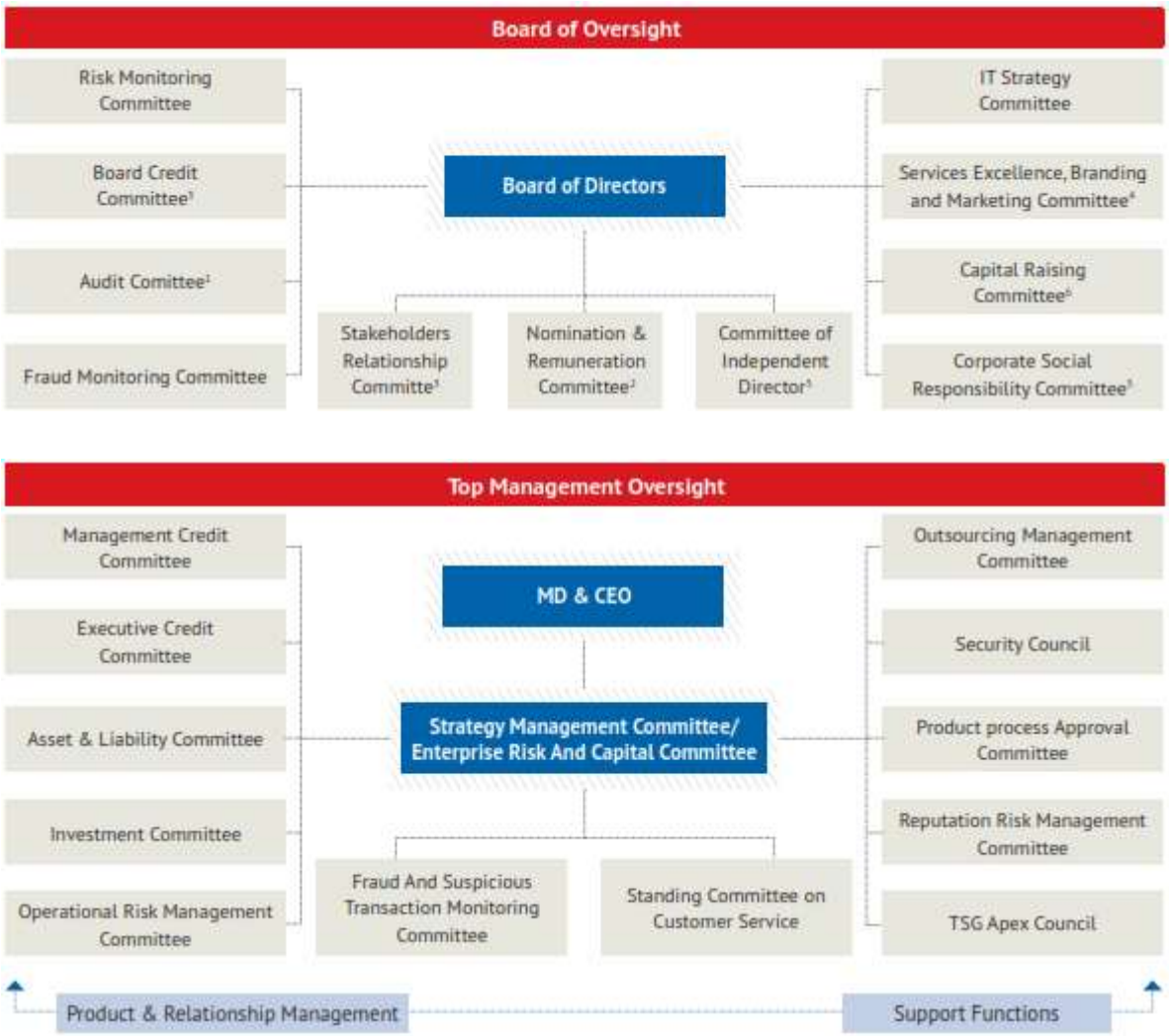
BANK'S PHILOSOPHY ON CODE OF GOVERNANCE

YES BANK is committed to set the highest standards of Corporate Governance right from its inception benchmarked with the best class practices across the globe. Effective Corporate Governance is the manifestation of professional beliefs and values, which configures the organizational values, credo and actions of its employees. Transparency and accountability are the fundamental principles to sound Corporate Governance, which ensures that the organization is managed and monitored in a responsible manner for 'creating and sharing value'. The Bank believes that an active, well-informed and independent Board is necessary to ensure the highest standards of Corporate Governance. It is well recognized that an effective Board is a pre-requisite for strong and effective Corporate Governance. At YES BANK, the Board of Directors is at the core of its

Corporate Governance practices and oversees how the Management serves and protects the long-term interests of its stakeholders. The Bank's Corporate Governance framework ensures that it makes timely disclosures and shares accurate information regarding its financials and performance, as well as the leadership and governance of the Bank. The Code of Conduct for the Board and Senior Management, which is reviewed periodically, includes guidelines on fair practices, avoiding conflict of interest, compliances, and other pertinent corporate governance best practices. The Bank's Responsible Banking strategy is driven at the highest level by the Board, including the Managing Director & CEO, who review and approve the Bank's policies and programs in CSR and sustainable development. The Responsible Banking unit, headed by a Senior President & Country Head, is a core plank that cuts across all functions at the Bank to integrate sustainability imperatives in business strategies, approaches and targets. YES BANK's Annual Report for FY 2007-12 includes the Report on Corporate Governance that covers the Bank's corporate governance philosophy, policies, details on the Board of Directors, various Board Committees, remuneration of the Board and employees, and a statement of compliance with the Code of Conduct and Ethics by the Board and Senior Management.

RISK MANAGEMENT

The long-term financial security and success of the Bank is built on a robust risk management system. Through proactive and improved risk management practices, YES BANK's risk management function continuously works towards achieving financial stability and enhancing stakeholder value. The Bank's Risk Management Architecture is overseen by the Risk Monitoring Committee (RMC), an independent Board level sub-committee that strives to put in place specific policies, frameworks and systems for effectively managing the various risks. The Bank's Annual Report for FY 2007-12 includes the Management Discussion and Analysis that comprehensively covers the Bank's Risk Management systems, policies and processes, including risk strategy, and audit and compliance.



CUSTOMER SATISFACTION

The Indian customer is now globally connected more than ever before, and expects the highest standards of service quality. In this scenario when the Bank needs to be constantly at the vanguard of banking excellence, it believes that a blend of Digital and Physical (DIGICAL) customer service is the way forward. In addition to the Bank's nation-wide state-of-theart branch coverage, it has embraced digital banking in a big way and offers banking services through connected mediums including the internet, mobiles and ATMs. The Bank has arguably the best social media presence in the Indian banking space, and it has leveraged this presence to provide various touch points to its customers

to engage with the brand at their convenience. Through digital banking, the Bank provides its customers with a rich offering of valueadding content, key product information, contests, and enhancing financial literacy. YES BANK has witnessed a steady rise in customers moving to its digital banking platforms, such as mobile banking and internet banking. As on March 31, 2012, the Bank had 143,760 customers as active internet banking users, growing by 27.1% from March 31, 2012. The Bank witnessed strong growth in customers using its mobile banking application, with 41,257 customers using the mobile banking application as on March 31, 2012, up from 23,175 users on March 31, 2012, thus showing a strong growth of 78%. As on March 31, 2012, YES BANK had 484,386 customers who were receiving E-statements. Apart from enhancing customer experience, a move towards digital banking also reduces the carbon footprint of banking activities, as online platforms can replace a brick-and-mortar branch to provide essential banking services, reducing travel cost and resource consumption. During the year, the Bank improved its performance in the monthly customer satisfaction surveys, done on a sample based methodology. Towards Account Opening Experience - 54% of the survey takers reported an 'Excellent' experience, a further 42% reported a 'Good' experience with the rest reporting a 'Satisfactory' experience or below. Towards Overall Customer Satisfaction – 94% of the survey takers reported a 'Wow' experience, 3% reported a 'Good' experience with the rest reporting a 'Satisfactory' experience. During the year, the Bank received 18,302 customer complaints and had 121 complaints pending at the beginning of the year. 17,306 complaints were resolved at the end of the year while 1,117 were pending. Over 60% of the complaints received pertained to cash dispensing at ATMs. No awards were passed by the Banking Ombudsman during the year. The Bank has not identified any substantiated complaint on customer privacy in FY 2007-12. YES BANK leverages state-of-the-art technology and innovative practices to enhance customer delight. The Annual Report of the Bank for FY 2007-12 provides a comprehensive 'Process, Service & Technology Overview' that covers its key policies and processes, initiatives and achievements.

YES BANK'S BRAND AND SOCIAL MEDIA

YES BANK's branding strategy revolves around the positivity exuded by the single word "YES", underlining the twin ethos of service and trust and the promise to deliver a superlative banking experience. The Bank follows a 'one bank' approach where seamless integration and coordinated efforts across Business, Product, Strategy and Marketing ensure continuous improvements in the processes, products and services. The bank conducts brand health research through external partners to arrive at brand health scores that incorporate parameters including brand awareness, top of mind recall and brand consideration. The research also helps, identify brand personality traits and, benchmarking with the industry. Customer satisfaction and feedback surveys, and dipstick research studies have helped the Bank measure and improve upon its brand salience and impact in various stages of customer lifecycle.

YES BANK is strengthening its focus, and is investing significantly in new-age media and digital technology to achieve a deep customer engagement experience. It is among the most active, and most followed, financial services brands on social media.

The Bank continues its 5 year partnership with the Pepsi Indian Premier League, India's foremost domestic cricketing event, as the League's Official Central Partner (Financial Services Category). During the year, YES BANK was recognized in the Economic Times Promising Brands 2012 list. It was ranked as the 34th most valuable Indian brand by the Economic Times- Interbrand "Best Indian Brands Survey 2012", and among the top 500 global banking brands in the "The World's Most Valuable Banking Brands study 2012" by Brand Finance.

E-WASTE MANAGEMENT IN INDIA - THE CORPORATE IMPERATIVE

This study, based on multi-stakeholder responses and feedback, would help the e-waste value chain players vis-à-vis Government, industry, regulatory bodies like the pollution control boards, NGOs, recyclers, consumers and informal sector to understand the criticality of the issue and to work together. This report brings out perspectives on the

challenges, gaps and key drivers for the efficient management of electronic waste in India. The onus of tackling the e-waste problem is a joint responsibility of both consumer and producer. While there is a critical need for consumers to consciously choose brands which follow take-back policies; producers have to ensure their "producers' responsibility" by suitably collaborating with their peer companies and incentivizing the consumers to return the electronic equipment at the end of its life. It is essential that the government strictly enforces the E-Waste Rules which became mandatory in 2012 and develop a mechanism to strengthen the process of penalizing those who fail to comply.

Enabling Finance for scaling up Energy Efficiency in MSMEs

This knowledge paper puts together the experience and learning from the financial-model demonstration, and by discussing their appropriateness and relevance through one-on-one consultation with stakeholders, comprising SIDBI, SBI, SDC, EESL and FISME experts. It seeks to highlight the key challenges faced by the sector and provides possible financing solutions for the MSMEs. The report looks into the current technological ability of the MSMEs as well as the bottlenecks preventing scaling up of energy efficiency in their operations. It provides a critique on the uptake of various government schemes for financing energy efficiency in MSMEs. It also points to the need for synergy

between public and bank financing, and especially the imperative of developing appropriate technology financing business models.

GLOBAL ENGAGEMENT ON SUSTAINABLE DEVELOPMENT

YES BANK has taken a leadership position among its Indian banking peers in mainstreaming the sustainable development agenda at the global stage. As signatory to key global coalitions, such as the UNEP Finance Initiative (UNEP FI), UN Global Compact, the Natural Capital Declaration and CDP, the Bank has put forth the Indian viewpoint on key issues such as climate change, responsible finance and natural capital. YES BANK shares a strong relationship with UNEP FI and is the first Indian signatory to this global partnership between UNEP and the financial sector. During the reporting period, Namita Vikas, Senior President and Country Head –Responsible Banking, was elected as the Asia-Pacific Chair of the UNEP FI. The Bank has also been elected to its Global Steering Committee and sits on the Board of the Banking Commission. In addition, the Bank is on the Advisory Board of the Portfolio Carbon Initiative, which is

putting together a global framework to map financed emissions. YES BANK was the only financial institution from Asia to be invited by the UN Secretary General Ban Ki-Moon for the UN Climate Summit held in New York City in September 2012, where the Bank committed to a target of funding 500 MW of clean energy every year, with periodic upward revision, based on the clean energy market expansion in India. The Bank is Vice-Chair of Working Group III and member of Working Group I of the Natural Capital Declaration, a joint initiative of the UNEP FI and Global Canopy Programme, and is a Founder Member of the India GHG Program of the World Resources Institute, and sits on its Advisory Board. During the year, YES BANK was a part of several global platforms on sustainable development and climate change. The Bank's proposed MoU with Tata Institute of Social Sciences (TISS), reported in the previous reporting cycle, has been deferred as both parties continue to discuss the partnership.

FINANCIAL INCLUSION – INCLUSIVE AND SOCIAL BANKING

Financial Inclusion is an important developmental goal for India, not only for achieving inclusive growth but also for greater social justice. It remains a critical determinant of social inclusion for the poor and the vulnerable. YES BANK, as it crosses 10 years of institutional excellence, has focused on 'inclusive growth' of 'emerging India' through innovative business models and forging partnerships for seamless implementation. Working with the guiding principle of Frugal Innovations for Financial Inclusion (FI4FI), the Bank has systematically leveraged ICT and frugal business models to run appropriate products and services catering to the under-banked and unbanked population in India. YES BANK's Inclusive and Social Banking unit (ISB) offers products and services including direct micro-credit, micro saving and micro insurance and remittance services across various geographical and socio-economic contexts. Through YES LEAP, ISB's flagship program in rural India, the Bank has financed over 90,000 SHGs spread in 250 districts, thus directly reaching over 12 lakh families. YES SAHAJ, the Bank's award winning and globally recognized technology solution platform offers doorstep banking services using low-cost technology. In urban India, YES MONEY, a multi-channel domestic remittance service, offers low cost, safe and highly accessible remittance

platform to migrant labourers who wish to transfer funds to their native villages and towns. ISB's latest success, the YES Kisan Dairy Plus, offers a bouquet of financial services to dairy farmers. Towards creating a multiplier effect through larger collaborations, YES BANK was the first private bank to take advantage of the new RBI norms allowing scheduled commercial banks to appoint NBFCs (Non-Banking Finance Companies) as their business correspondents, and tied up with Muthoot Finance. The move will allow YES BANK to offer its products and services for the bottom of the pyramid through Muthoot Finance's over 4,000 branches across India, and further the cause of digital financial inclusion in the country.

RISK ANALYSIS AND MANAGEMENT IN BANKING SECTOR

Banks have matured from being a financial intermediary into a risk intermediary as they are exposed to severe competition and hence are compelled to encounter various types of financial and nonfinancial risks. In the world today, risks and uncertainties form an important part of banking business which by nature entails taking risks. Banks are now required to clearly separate avoidable and unavoidable risks and are required to focus on the extent to which such risks can be shoulder by them. Risk management i.e. trade-off between risk and return in the banking sector is a vital issue linked to financial system stability. Unsafe risk management practices governing bank lending often plays a central role in financial turmoil, most notably seen during the financial crisis of 2008. Credit risk, which is attached to bank loans and forward contract, represents the most important type of risk in the banking business. The risk of defaults or protracted arrears on outstanding loan is termed as credit risk. According to the consultative paper issued by the Basel Committee on Banking Supervision, for most of the bank in the world today loans are the major and most obvious sources of credit risk. Credit risk is the potential that a bank borrower or counter party fails to meet the obligations on agreed terms. It may arise from either an inability or an unwillingness of the borrower to perform in the pre committed contracted manner. Banking Policies and Strategies are formed depending upon type and structure of ownership of a bank. Organizational culture, attitude and behaviors also differ according to type of bank ownership i.e. Private owned banks and

state-owned banks. This difference leads to different levels of risk-taking behavior and banks performance and in turn results into varying level of credit risk in different types of banks. The foundation of a sound economy depends on how sound the banking sector is and vice versa. Banks are very brittle institutions which are built on customers‟ trust, brand reputation and above all risky leverage. In case something goes wrong, banks can collapse and failure of one bank is enough to send shock waves right through the economy. In spite of heavy regulations in the last two decades, many developed and growing countries have witnessed severe banking crises. Therefore, banks are required to develop the system which involves minimum risk exposure. Banking institutions must take risk, but they must do consciously. Bank management must take utmost care in identifying the type as well as the degree of its risk exposure and tackle those effectively. Moreover, bankers should follow risk management as an ongoing and valued activity with the board setting the example. They also try to ensure that their risk taking is informed and prudent.

Why Risk Management?

The banking sector all over the world has witnessed stiff competition not only from the domestic banks but also from foreign banks alike. In fact, competition in the banking sector has emerged due to disintermediation and deregulation. The liberalized economic scenario of a country has opened various new avenues for increasing revenues of banking business. In order to grab this opportunity, commercial banks in India also have launched several new and innovated products and facilities like ATMs, Credit Cards, Mobile banking, Internet banking etc. Apart from the traditional banking products, it is seen that mutual funds, insurance etc. are being designed/ upgraded and served to attract more customers to their fold. Deregulation in the Indian economy, product/ technological innovation and increased volatility in the capital market has considerably increased the risk exposure of commercial banks. Thus, this has forced banks to focus their attention to risk management. The two most vital developments that have made it imperative for Indian commercial banks to give emphasize on risk management are–

(a) Deregulation:

The financial sector reforms which started in early 1990s have culminated into deregulation in a phased manner. Deregulation has given banks more freedom in areas like lending, investment, interest rate structure etc. Therefore, banks are required to handle their own business themselves and at the same time maintain liquidity and profitability. This has increased risk management awareness among the commercial banks.

(b) Technological innovation:

Technological innovations have provided a plinth to the banks for creating a customer friendly environment and also for designing various new products. In fact, it is technological innovation that has helped banks to manage the assets and liabilities in a better way, providing various delivery channels, reducing processing time of transactions, reducing manual intervention in back-office functions etc. But all these developments have increased the diversity and complexity of risks, which need to be managed professionally so that the opportunities provided by the technological invention are not negated.

VARIOUS TYPES OF RISKS IN BANKING BUSINESS

The word „risk" is derived from an Italian word „rescore" which means „to dare". Risk is more a „choice" than a „fate". An extension of this analogy tells that risk is a possibility of loss or injury perils and the degree of uncertainty in return. It may be defined as „possibility of loss", which may be financial loss or loss to the image or reputation. Banks like any other commercial organization also intend to take risk, which is natural for any type of business. Higher the risk taken; higher the gain would be. But higher risks may also turn into higher losses. The major risks in banking business are listed below –

Financial Risk

Financial risk crops up from the business transaction assume by a bank, which is exposed to potential loss. This risk can be further classified into Default or Credit risk and Market risk.

1. Default or Credit Risk

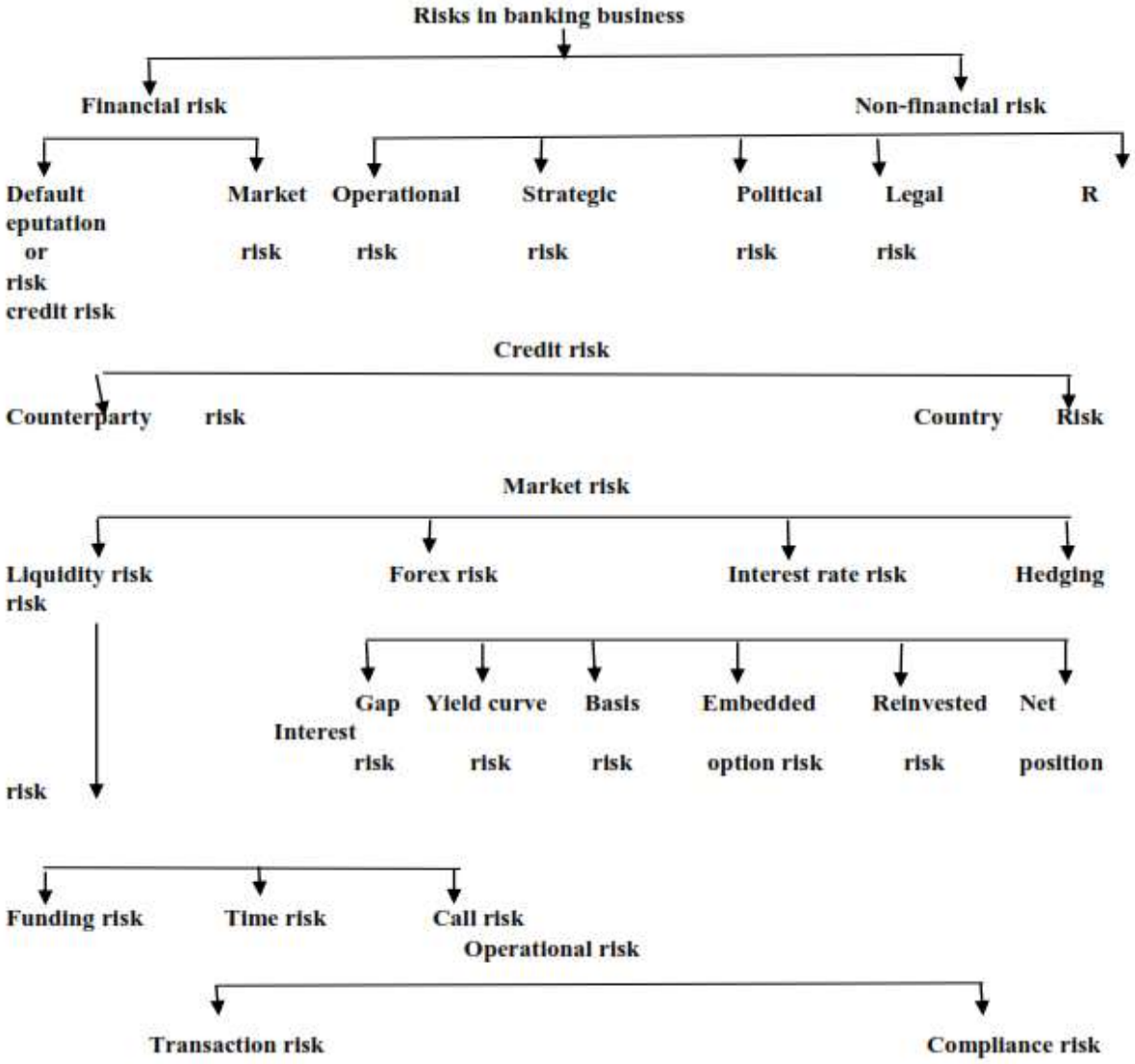
Credit risk is more simply defined as the potential failure of a bank borrower or counterparty to meet its obligations in accordance with the agreed terms. In other words, credit risk can be defined as the risk that the interest or principal or both will not be paid as promised and is estimated by observing the proportion of assets that are below standard. Credit risk is borne by all lenders and can lead to serious liquidity problems, if excessive. For most banks, loans are the largest and most obvious source of credit risk. There are two variants of credit risk which are discussed below –

1.1. i) Counterparty Risk:

This type of credit risk is related to non-performance of the trading partners due to counterparty's refusal and or inability/ unwillingness to perform. The counterparty risk is generally viewed as a fleeting financial risk associated with trading rather than standard credit risk.

1.1. ii) Country Risk:

This is also a type of credit risk where non-performance of a borrower or counterparty arises due to constraints or restrictions imposed by a nation. Here, the reason of nonperformance is external factors on which the borrower or the counterparty has no control.



Market Risk

The unfavorable deviations of the mark-to-market value in the trading portfolio due to market movements and the risk of liquidation of the transactions during the period is called market risk. It is the risk that the value of on-/off-balance sheet positions will be negatively affected by movements in equity and interest rate markets, currency exchange rates and commodity prices. In the case of banking business, market risk arises on bank's earnings and capital due to changes in the market level of interest rates or prices in securities, foreign exchange and equities, as well as the volatilities, of those prices.

a) Funding Liquidity Risk: Funding Liquidity Risk is defined as the inability to obtain funds to meet cash flow obligations. For banks, funding liquidity risk is crucial. The main cause of this sort of risk is to replace net outflows due to unanticipated withdrawal/ non-renewal of deposits (wholesale and retail).

b) Time Risk: Time risk arises from the need to recompense for non-receipt of expected inflows of funds i.e., performing assets turning into non-performing assets.

c) Call Risk: this type of risk arises due to crystallization of contingent liabilities. It may also crop up when a bank may not be able to undertake profitable business opportunities when it arises.

d) Embedded Option Risk: Significant changes in market interest rates produce the source of risk to banks‟ profitability by encouraging prepayment of cash credit/demand loans, term loans and exercise of call/put options on bonds/ debentures and/ or early withdrawal of term deposits before their stated maturities. The embedded option risk is experienced in volatile situations and is becoming a truth in India. The faster and higher the magnitude of changes in interest rate, the greater will be the embedded option risk to the banks‟ Net Interest Income. The result is the drop in projected cash flow and the income for the bank.

e) Reinvested Risk: Reinvestment risk is the risk arising out of uncertainty in interest rate at which the future cash flows could be reinvested. Any gap in cash flows i.e., inflow and outflow would expose the banks to variation in Net Interest Income. This is because market interest received on loan and to be paid on deposits move in different directions.

f) Net Interest Position Risk: Net Interest Position Risk arises when the market interest rates fiddle with downwards and where banks have more earning assets than paying liabilities. Such banks will follow a practice of reduction in NII as the market interest rate declines and the NII increases when interest rate rises. Its impact is on the earnings of the bank or its impact is on the economic value of the banks‟ assets, liabilities and OBS positions.

Non-Financial Risk

Non- financial risk refers to those risks that may affect a bank's business growth, marketability of its product and services, possible failure of its strategies for business growth etc. The causes of non- financial risk are management failures, competition, non-availability of suitable products/services, external factors etc.

Techniques of Risk Management

GAP Analysis:

It is an interest rate risk management tool based on the balance sheet which focuses on the possible fluctuation in net-interest income over specific time intervals. In this method a maturity/ re-pricing programme is prepared on the basis of distribution of interest-sensitive assets, liabilities, and off-balance sheet positions into time bands according to their maturity (in case of fixed rate) or time left to their next re-pricing date (in case of floating rate). These programmes are then used to create indicators of interest-rate sensitivity of both earnings and economic value to changing interest rates. After selecting the time intervals, assets and liabilities are grouped into these time buckets according to maturity (for fixed rates) or first possible re-pricing time (for flexible rates). The assets and liabilities that can be re-priced are termed as Rate Sensitive Assets (RSAs) and Rate Sensitive Liabilities (RSLs) respectively. Interest sensitive gap or simply GAP reflects the divergence between the volume of rate sensitive asset and the volume of rate sensitive liability and calculated by, GAP = RSAs – RSLs. The information on GAP gives the organization an idea about the effects on net-income due to changes in the interest rate. Positive GAP can reflect an increase in future interest rate would increase the net interest income as the change in interest income is greater than the change in interest expenses and vice versa.

Duration-GAP Analysis:

It is another reflection of interest rate risk and managing net interest income derived by taking into account all individual cash inflows and outflows. Duration is the value and time weighted measure of maturity of all cash flows. It will show the average time required to recover the invested funds. Duration analyses imitate the elasticity of the market value of a financial instrument with respect to its interest rate. Duration gap (DGAP) reflects the deviation in the timing of cash flow in asset and liability and is given by, DGAP = DA - u DL. Where DA is the average duration of an asset, DL is the average duration of a liability, and u is the liability/ asset ratio. An increase in interest rate by comparable amounts will reduce the market value of assets (more than that of liabilities) resulting in drop of the market value of equities and expected net interest income and vice versa.

Value at Risk (VaR):

It is one of the latest risk management tools. The Value at Risk (VaR) indicates how much a firm can lose or make with a certain probability in risk during a certain time period. VaR summarizes intrinsic financial risk in portfolios into a simple number. In general, VaR is used to calculate market risk but it also identifies many other risks like foreign currency, commodities, and equities.

Risk Adjusted Rate of Return on Capital (RAROC):

It points out consistently an economic basis to measure all the relevant risks in a transaction and use as an efficient tool in respect of risk/return trade off in different asset classes. As economic capital protects financial institutions against unexpected losses, therefore it is vital to allocate capital for various risks that these institutions are confronted with. Risk Adjusted Rate of Return on Capital (RAROC) analysis shows how much economic capital is needed by different products and businesses and determines the total return on capital of a firm. Though Risk Adjusted Rate of Return (RAR) can be used

to assess the capital requirements for market, credit and operational risks but RAROC is used as an integrated risk management tool.

Securitization:

It is a process studied under the systems of structured finance or credit linked notes. Securitization of a bank's assets and loans is a tool for raising new funds and reducing bank's risk exposures. The bank accumulates a group of income-earning assets (like mortgages) and sells securities against these in the open market, thereby transforming illiquid assets into tradable asset backed securities. As the returns from these securities lies on the cash flows of the underlying assets, the burden of repayment is transferred from the originator to these pooled assets.

Sensitivity Analysis:

This analysis is very useful when attempting to determine the impact or the actual outcome of a particular variable will have if it differs from what was previously assumed. By creating a given set of scenarios, the analyst can determine how changes in one variable(s) will shock the target variable.

Internal Rating System:

An internal rating system helps financial institutions to manage and control credit risks as they face from lending and other operations, by grouping and managing the credit-worthiness of borrowers and the quality of credit transactions.

Process of Risk Management

Process of Risk Management Includes the Following Steps:

1. Risk Identification: At first, all types of risk must be identified and their likely effect on the bank's operation in the short-run is understood. A bank that has international operations may experience different intensity of credit, market and operational risks in

various countries when compared with a pure domestic bank. Even within a bank, risks may vary in its domestic operations and its overseas arms.

2. Risk Measurement: Measurement means weighing the contents and/or value, intensity, magnitude of any object against a benchmark. The objective will be to find out and comprehend the exact degree of risk elements includes in each category of operational environment. While a very simple qualitative assessment may be satisfactory in some cases, sophisticated methodological/statistical models will be necessary in others for finding out the quantitative value of risk.

3. Risk Monitoring: Keeping a close watch on risk identification measurement activities in the light of the risk, principles and policies is a core function of a risk management system. For the success of the system, it is essential that the operating wings should perform their usual activities within the broad contours of the organization's risk perception.

4. Risk Control: There must be a suitable mechanism to control and steer the operation of the risk management system in the entire organization through a set of control devices. These can be achieved through a host of management processes such as assessing risk profile techniques regularly, analyzing internal and external audit feedback from the risk angle and using it to activate control mechanisms.

Role of Risk Management of Indian Banks

The Central bank of India i.e. RBI has been using CAMELS rating to evaluate the financial soundness of the commercial banks. The CAMELS Model consists of six components namely Capital Adequacy (C), Asset Quality (A), Management (M), Earnings Quality (E), Liquidity (L) and Sensitivity to Market risk (S).

The Basel Committee on Banking Supervision (1988) has recommended for using of CAMEL as a criteria for assessing financial institutions in case of any international settlement. The sixth component i.e. sensitivity to market risk (S) was added to CAMEL in 1997 (Gilbert et al., 2000). However, most of the developing countries are using CAMEL instead of CAMELS in the performance evaluation of financial institutions. The Central Banks in some of the countries like Nepal, Kenya use CAEL instead of CAMELS. CAMEL's framework is a widespread method for evaluating the soundness of financial institutions.

In India, during pre-liberalization era (early 1990s), the focus of the statutory regulation by RBI in case of commercial banks was mainly on licensing, administration of minimum capital requirements, pricing of services including administration of interest rates on deposits as well as credit, reserves and liquid asset requirements. Therefore, the supervision norms had to focus essentially on solvency issues. After the evolution of the BCBS prudential norms for international settlement in 1988, the RBI took a series of measures to realign its supervisory and regulatory standards and bring it at par with international best practices. Keeping in mind the socioeconomic conditions of the country, the business practices and payment systems prevalent in the country and the predominantly agrarian nature of the economy RBI ensured that the prudential norms were applied over the period and across different segments of the financial sector in a phased manner.

Finally, it was in the year 1999 that RBI realized the need of a robust risk management procedure for banking institutions in India and issued guidelines accordingly in the area of assets liability management and management of credit, market and operational risks. The entire supervisory mechanism has been reconstituted under the directions of a newly constituted Board for Financial Supervision (BFS), which functions under the aegis of the RBI, to fulfil the demanding needs of a strong and steady financial system. The supervisory jurisdiction of the BFS is now being extended to the entire financial system barring the capital market institutions and the insurance sector. The periodical on-site inspections, and also the targeted appraisals by the Reserve Bank, are now supplemented

by off-site surveillance which mainly focuses on the risk profile of the supervised institution. A process of rating on the basis of CAMELS in respect of Indian banks and CACS (Capital, Asset Quality, Compliance and Systems & Control) in respect of foreign banks has been started since 1999. Since then, the RBI has moved towards more strict capital adequacy norms and adopted the CAMEL (Capital adequacy, Asset quality, Management, Earnings, Liquidity) based rating system for evaluating the financial capability of Indian banks. The Reserve Bank's regulatory and supervisory responsibility has been widened to embrace financial institutions and non-banking financial companies. As a result, considering the rapid changes in the banking industry, the thrust lies upon Risk - Based Supervision (RBS). The main supervisory issues addressed by Board for Financial Supervision (BFS) targeted towards on-site and off-site supervision of banks. The on-site supervision system for banks is on an annual cycle and is based on the „CAMEL" model. It focuses on core assessments in accordance with the statutory mandate, i.e., solvency, liquidity, operational soundness and management prudence. Thus, banks are rated on this basis. Moreover, in view of the recent trends towards financial integration, competition, globalization, it has become essential for the BFS to supplement on-site supervision with off-site surveillance so as to capture „early warning signals" from off-site monitoring that would be helpful to prevent the likes of East Asian Financial Crisis. The off-site monitoring system consists of capital adequacy, asset quality, large credit and concentration, connected lending, earnings and risk exposures viz., currency, liquidity and interest rate risks. Apart from this, the fundamental and technical analysis of the script in the secondary market will serve as a supplementary meter of financial performance of banks.

Thus, on the basis of RBS, a risk profile of individual Bank will be prepared at first. A high-risk sensitive bank will be subjected to more rigorous supervision by shorter periodicity with superior use of supervisory tools aimed on structural meetings, additional off-site surveillance, regular onsite inspection etc. The main focus is on the development of Indian financial system at international standard.

THE THEORY OF BANK RISK TAKING AND COMPETITION: A STUDY OF YES BANK

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Risk is an opportunity as well as a threat and has different meanings for different users. The performance of a bank from the viewpoint of profitability is not very meaningful unless the same is accounted for along with the risk. After economic liberalization, the banks were free to introduce new products and free to charge price their products with varying risk associated with the instrument. Thus, the banking industry is exposed to different risks which can adversely affect its profitability and financial health. Therefore, risk analysis and its management have emerged as a new and challenging area in banking business. Reform process and the guidance of Basel Committee have directed the Indian banking industry in the right path so far risk management is concerned. They have adopted best structures, processes and technologies available worldwide and have moved from strength to strength.

CHAPTER - 2

LITERATURE REVIEW

Darell Duffie Kenneth J Singleton in His Book (2012), in their book discussed that in the course of running a business, decisions are made in the presence of risk. They have prescribed several credit risk models to measure the rate of defaulters.

Nachane and Ghosh (2012) summarized Net Interest Spreads as a measure of intermediation profitability before credit losses. They connected the Credit Ratings and Net Interest Spreads value‟s impact on the Credit Ratings of Indian state-owned Banks using quarterly data for the period 1997 Q1 to 2002 Q4, besides considering the impact of several other variables on the Credit Ratings of banks using Multinominal Logit Model. Net Interest Spreads i.e., the difference between total interest income and total interest expenses, can be taken to be a proxy for earnings. The banks with low Net Interest Spreads would attempt to increase fee income by selling derivative products and thus, due to the diversification, besides the traditional banking activities, could get a better Credit Rating. Banks with high Net Interest Spreads might be inclined to lock-in their spreads by not using hedging instruments. A high Net Interest Spread in the long-run would translate into a lower Credit Rating for the bank as it would be interpreted as evidence of the absence of diversification of banking operations.

Gorton and Rosen (2012) emphasized that Risk taking remains the core activity of banks, yet it has also been proved that excessive risk taking is the principal bank default factor. In the 1980s, U.S. banks became systematically less profitable and riskier as nonbank competition eroded the profitability of banks' traditional activities. Bank failures rose exponentially during this decade. The leading explanation for the persistence of these trends centers on fixed-rate deposit insurance: the insurance gives bank equity holders an incentive to take on risk when the value of bank charters falls. They proposed test an alternative explanation based on corporate control considerations and showed that managerial entrenchment played a more important role than did the moral hazard

associated with deposit insurance in explaining the recent behavior of the banking industry.

Jadhav, N. (2012) observed that during the Pre- Reform Period (1969 to1991), a complex structure of interest rates existed in the Indian Banks, and due to the provision of direct and concessional credit to certain sectors, cross- subsidization among borrowers was encouraged. Moreover, due to the complex interest rate structure, the maintenance of Net Interest Spreads adversely impacted the regulation of both, deposits and lending rates. This resulted in distorting interest rates mechanism which adversely affected the viability and profitability of banks. The lack of due recognition to the importance of accountability, transparency, and prudential norms in the smooth operations of the banking sector led to a rising burden of Non-Performing Assets. Also, the joint balance sheets of the Government, RBI and Commercial Banks, together with the transactions between the three segments, were governed by plan priorities than sound principles of financing. The Camel Model (Capital Adequacy, Assets Quality, Efficiency of Management, Quality of Earnings and Liquidity of Financial Institutions) for the period 1981to 2003 for calculating Financial Parameters for the SCB‟s was used, and it was found that reforms have brought efficiency into the banking system by way of a reduction in Net Interest Spreads.

Mohan, Rakesh (2012) highlighted cross-subsidization of interest rates between borrowers on loans in Brazil using the Ratio Analysis Methodology for 2001 to 2006. It was concluded that Net Interest Spreads were extremely high in Brazil, being ten times larger than the typical spreads in the developed countries, and three times larger than the Latin American average. This regulation took the form of credit and interest rate controls. Specifically, Brazilian commercial banks were required by law to allocate a large fraction of their funds to selected borrowers at below-market interest rates. The banks then compensated the losses they made in such selected loans by charging a disproportionately higher spread to the non-selected borrowers which increased the overall Net Interest Spreads.

Singh and Tandon (2012) analysed Asset/Liability Management (ALM) in the Indian Banking System from 1990 to 2012 and suggested strategies to meet various types of risks, viz. market risk, financial risk, interest rate risk etc. Asset-Liability Management (ALM) is one of the important tools of risk management. The net income of the banks is risk-sensitive and the objective of the study was to describe the concept and application of the ALM technique which is a dynamic and comprehensive mechanism for managing, measuring and monitoring the market risk associated with a bank. It consists in the management of the structure of the bank's balance sheet (both assets and liabilities) in such a way that the net interest earnings are maximized within the overall risk-preference (present and future) of the financial institutions. The ALM functions extend to and incorporate management of market risk, liquidly risk, trading risk, funding, profit planning, capital planning and growth projections.

Caprio, Gerald and Daniela Klingebiel (2012), tried to provide a good length of data of various countries that suffered from the problem of bank insolvencies comprising of various episodes of systemic and borderline financial crisis, that helps in making it amply clear that the problem of banking insolvencies is not restricted to a few countries but is a problem that occurred in almost every country.

Rochet and Tirole (2012) argued that the recent increase in the amount of inter-bank transactions, which may not be properly collateralized or insured, increased the likelihood of systemic crash in the banking industry.

Conford & Coyle (2012), examined model that effects on banks of the introduction of the market for credit derivatives, particularly, credit default swaps. Their paper examined that a bank can use swaps to temporarily transfer credit risk of their loans to others, reducing the likelihood that defaulting loans trigger to bank's financial distress. They concluded that introduction of credit derivative market is not desirable because it can cause other markets for loan risk sharing to break down.

Suvova (2012), in their book emphasized that banks make money by taking risks and lose money by not managing risks effectively. Banks also take higher risk to produce superior shareholder returns in current markets resultantly bankers should develop cultures that foster and reward the management of risk and try to continually update their risk management policies to ensure that they reflect changing industry dynamics. Bank of International Settlement Report, Eastern Caribbean Central Bank Guidelines on credit risk management provides a detailed review of credit risk management in banking sector that help in making conceptual and theoretical understanding of credit risk management.

Stein (2012), in her article tried to produce a brief account of risk management in first period of transition during 1990s. It also says that credit assessment system in Russia consists of portfolio management (establish a better lending asset structure by assessing an expected loss from loans as a whole) and individual credit (credit one by one and takes safeguarding measures such as the inspection and management of each credit and the requirements of collateral) should be used to judge a debtor's ability to repay debts consistently and strictly. Various processes like credit policy, credit approval, credit monitoring, credit examination, client screening, credit analysis, operating cash flow analysis taking into consideration quantitative and qualitative factors should be involved in credit risk management process.

Altman (2012), highlighted that the models for the risk measurement and management is important for efficient resource allocation. He further explained that when risk is better evaluated, it can be more accurately priced; if it can be more-accurately priced, it can be more easily spread among a larger number of market participants, improving the risk bearing capacity of the market. The Formal risk models provide a systematic and disciplined way for firms to measure changes in the riskiness of their portfolios, and they also provided a framework to help firms to develop strategies in order to manage change in their risk.

Barth et al. (2012) explained the importance of credit risk. The main objective of this paper was to enable a bank's view towards a credit obligor. Banks are subject to a lot of financial risks. Banks also have to manage the objective of maximum profit on one hand, the prudential rules on the other hand. New Basel Capital Accord brings relatively strict conditions which should improve bank management of credit risk but which are unpleasant for loaning of small and medium enterprises including agricultural ones that are mostly part of this category. The author strongly believed that the most important role will be still played by non-market supporting instruments, especially guarantees provided by sovereigns. They can improve the competitiveness of agricultural enterprises in the credit market.

Greuning, H. and Bratanovic, S.B. (2012) discussed two of the primary motivating influences on the recent development/revisions of credit scoring models, the important implications of Basel II's proposed capital requirements on credit assets and the enormous amounts and rates of defaults and bankruptcies in the United States in 2001-2002. Two of the more prominent credit scoring techniques, Z-Score and KMV's EDF models, were reviewed. Both models were assessed with respect to default probabilities. It was concluded that in order to be effective, these and other credit risk models should be utilized by the firms with a sincere credit risk culture.

Peyman Mestchiant (2012), discussed in their book how corporate governance and analyzing and managing Banking Risk are related to each other. They pointed out that is a weak corporate governance is challenge to effective credit risk management.

Sylvain Bouteille, Daine Coogan Pushner (2012), in his paper emphasized that Risk Management Lesson from the Credit Crisis; European Financial Management highlighted the Credit crisis event of 2007 and 2009 which showed the serious deficiency in risk models. Risk Models failed largely due to unknown structural and regulatory changes in market. CRM needs to be improved and put great emphasis on stress test and scenario analysis.

Mario Anolli, Elena Beccalli and Tommaso Giordani (2012) found that Basel III would not end up achieving significant results. They believed the banking industry has generally been able to curb meaningful increases in equity requirements in excess of what banks usually maintained prior to the 2008 crisis. In addition, implementation is too slow, "with little beginning before 2012 and phasing in running for grandfathered changes to the definition of capital". They also look at the crucial issue of Basel II not clearly addressing the problem of 'promises' in the financial arena being treated unequally. The implications of this phenomenon on the reform process are profound, especially on aspects such as supervision and the incorporation of the shadow banking system into the regulatory. They also explored modifications in the risk-weighted asset framework so as to address issues of concentration in risk models. As a specific example, they suggest that 'a quadratic rule applied to deviations from a diversified benchmark portfolio' is one rational way of enhancing the overall framework.

Bucur and Dragomirescu (2012) in his paper examined that the Prudent credit risk management within a bank requires that a number of agents within the firm communicate, agree and act in a concerted fashion to manage credit exposures both at the individual exposure level and at the broader portfolio level. This can be challenging given the nature of credit portfolios. Even if highly diversified, credit portfolios display heavily skewed loss distributions that imply relatively long quiescent periods (during which losses are lower than their mathematical expectations and the benefits of risk management less visible) and occasional periods of much higher losses. In this non-technical paper, they reflect on some of these challenges and discuss mechanisms, such as credit-transfer pricing by which banks can better align the behaviors of underwriters, risk managers and senior managers within large institutions while also increasing the communications between these groups.

Allen et al. (2012) found interesting observations about the 'real' cause of concern in relation to Basel III. While they concur, that Basel III does threaten to reduce credit supply (and in-turn economic output), they believe the source of this problem is not the need to maintain higher capital. Instead, the challenge lies in "ensuring a coordinated

adoption" of these new norms across the breadth of entities in the financial services industry. They further remark that authorities should aim to utilize the long-time horizon for Basel III implementation to "engage both banks and investors in constructive dialogue" with regard to changes necessary in business operations.

Yan et al. (2012) undertakes an insightful study on the long-term cost-benefit of the Basel III norms for the United Kingdom (UK). They found that the optimal tangible common equity capital ratio is 10 percent of risk-weighted assets (RWAs), as against the Basel III figure of 7 percent. They thus build a case for Basel III having a net positive long-term effect on the UK economy. They also estimated the maximum net benefit when banks meet the Basel III long-term liquidity requirements. Through their study, they actually infer that UK banks should raise common equity in their capital base in excess of the Basel III stipulations.

Sylvain Bouteille, Daine Coogan Pushner (2012) xlvii in their book studied the Sequential steps in management of a credit portfolio risk:

i. Origination: It concluded the main reasons why properly managing of a portfolio credit exposure is essential to generate profits and produce an adequate return on equity.

ii. Credit Assessment: introduced the methods to estimate the amount of exposure generated by transaction of various natures before detailing how to analyses the credit worthiness of a company.

iii. Portfolio Management: It studied the fundamentals of CPM which consists of analyzing the totality of exposure owned by the firm. The main goals of CPM are to avoid accumulation on some companies or industries to prevent losses by acting when the financial situation of counterparty deteriorates and to estimate and minimize the amount of capital necessary to support a credit portfolio.

iv. Mitigation and transfer: Introduced techniques or safeguards to risk managers either transfer the credit risk or neutralize it with an offsetting position known as hedging

Joseph, Mabvure Tendai Edson, Gwangwava (2012) The purpose of the study was to find out the causes of non-performing loans in Zimbabwe. Loans form a greater portion of the total assets in banks. These assets generate huge interest income for banks which to a large extent determines the financial performance of banks. However, some of these loans usually fall into non-performing status and adversely affect the performance of banks. In view of the critical role banks play in an economy, it is essential to identify problems that affect the performance of these institutions. This is because nonperforming loans can affect the ability of banks to play their role in the development of the economy. A case study research design of CBZ Bank Limited was employed. Interviews and questionnaires were used to collect data for the study. The paper revealed that external factors are more prevalent in causing nonperforming loans in CBZ Bank Limited. The major factors causing nonperforming loans were natural disasters, government policy and the integrity of the borrower.

Ping Han (2012), in his book studied the various nuances of credit risk. It discussed various techniques to measure, analyze and manage credit risk for both lenders and borrowers. The book begins by defining what credit is and its advantages and disadvantages, the causes of credit risk, a brief historical overview of credit risk analysis and the strategic importance of credit risk in institutions that rely on claims or debtors. The book then details various techniques to study the entity level credit risks, including portfolio level credit risks.

Souza, E. (2012) opined that it was the highlighted the weak loan recovery, poor capital position, high cost and low profitability of the Indian Public Sector Banks. The Committee signaled these causes, specifically to the managerial and policy environment within which banks had operated, and sought to improvise the overall efficiency of the banking system by the introduction of transparency in operations, thus enabling the banking sector to operate in a sound financial framework. Hence, controls on interest rates were removed, preemption of bank assets were significantly reduced, and supervisory and regulatory standards were strengthened with the introduction of new norms of asset classification. Also, Capital Adequacy Requirements were formulated

based on Narasimham Committee‟s initial recommendations. The Ratio Analysis Methodology was used for analyzing Profitability and Efficiency of the PSBs in the 1990‟s.

Levine, R. (2012), studied contractual savings organizations (pension funds and life insurance companies) for Argentina, Brazil, Mexico, and India, and concluded that they do not increase the rate of savings but shift the composition of total savings towards long-term financial assets on the basis of balance sheet and income statement of unbalanced sample of commercial banks over the period 1991 to 2000, as aggregated by a country each year. The significance of the relationship between the development of contractual savings institutions and banks‟ profitability and loan maturity choices was emphasized. The potential ways through which the development of contractual savings institutions may affect the banking sector was further discussed. The development of contractual savings institutions had a major impact on Net Interest Spreads and loan maturity. If these institutions were competitors to banks, then banks may respond to the competitive pressures by concentrating on their basic comparative advantage (as associated to narrow banking), by increasing the short- term loans provision. But, since price competition existed, it is likely expected that a decrease in Bank Net Interest Margins would henceforth follow as contractual savings institutions further developed as competitors. On the other hand, if contractual savings institutions provided resources to the banking system as a whole, either in the form of deposits, loans, or by buying securities issued by banks, the latter will be comparatively less subject to liquidity risks at a given level of long-term assets. The banks, then, may increase the supply of long-term loans.

Raja Almarzoqi, Sami Ben Naceur and Alessandro D. SScopelliti (2012), provided a broad and applied investigation of theories and methods of CRM. It helps to provide knowledge on interconnection of risk management with other firm operations and industry regulations. The book mainly focused on retails customers, actual creditworthiness of borrowers. Authors assessed the pros and cons of credit risk modeling for operational process, policy definition, business goal setting and organization change.

This book increased awareness of data quality, role of macro variables to evaluate their impact of customer and portfolio performances.

Abdur Choudhury (2012), sought to analyze the factors that lead to rising credit risk in the Zimbabwean banking sector. The objective was to ascertain the impact of macroeconomic, industry and bank specific factors on rising credit risk in in Zimbabwe. The study aimed at contributing to credit risk management literature by providing evidence Sub Saharan context. Being anchored on the positivist quantitative research approach, a survey was carried out gather the data that were analyzed using descriptive, correlation and regression analyses. The results revealed that the most significant factors leading to credit risk in the Zimbabwean banking sector were macroeconomic and bank specific factors. The industry factors did not show a significant influence on the rising credit risk. The research findings of this study will a valuable addition to the existing knowledge and provide a platform for further research on how the credit risk problems can be dealt with. While credit risk is known as one of the risks inherent to any banking institutions, the alarming levels of credit risk in the Zimbabwe banking sector has motivated this current study to critically analyze the factors that have led to the high credit risk levels.

Ramaiah and Ghosh (2012), in their book showed the concept of PD, LGD, estimation, forecasting, correlation modeling and stress testing models. This book focused on mainly Commercial Loans like SME, real estate loans, Mortgage loans. The book discussed impact of Basel accords on PD, LGD and EAD credit risk models.

Kataria, Nageshwara (eds.) (2012), discussed that Credit risk rating; risk pricing and earnings require to be integrated into a proper loan pricing policy and optimal capital allocation. The chief purpose of this paper was to suggest some risk rating models for the consideration of adoption by the commercial banks. The author believed that the need of the hour in a lending-rate deregulated environment is the design of credit scoring models for risk rating and pricing. In Section 2, sources of credit risk are highlighted. Section 3 presents a credit risk analysis of borrowers and a simple credit-scoring model with

illustration for risk rating was developed. Section 4 puts forth suggestions for obtaining organizational and systems support for credit risk management in banks, while Section 5 concluded with some caveats for credit risk management.

Pallab Sikadar and Munish Makkad (2012), in his book emphasized on credit risk developments in India and guides the banking sector for eventual migration to the sophisticated tools for assessing, monitoring and controlling risks in their credit portfolio. It talks about the Basel II implementation challenges in banks and provides a road map to improve risk management culture in banks.

Udeshi (2012), provided an insight view of financial liberalization, Progress in Banking regulatory reforms, negative impact on Profitability and Viability of public sector Banks due to Non-Performing Assets, unsolved Problem of Non-Performing Assets and continued distress and volatile performance from year to year. It is expected that a robust regulatory system should suffice to carry banking system to health and rejuvenated income stream would address the issue of weak and bankrupt banks. A Report from OECD Maximizing Value of Non-Performing Assets Proceedings from the third forum for Asia Insolvency reform (Nov 2003) says it is Non-Performing Asset's whose negative effect hampers the growth of banking as well as financial sector. The outlook of bankers towards credit delivery, Excessive focus on credit risk management, High cost of funds due to non-performing assets, Negative impact of banks script on stock exchanges, Excess liquidity lending, default functional efficiency. So, in order to reduce negative impact steps must be taken to reduce non- performing assets.

K Vaidynathan (2012) explained that banking sector reforms in India started as a follow up measure of the economic liberalization and financial sector reforms in the country. Reforms were aimed at to make the Indian banking industry more competitive, versatile, efficient and productive to follow international accounting standard and to free from the government's control. The reforms in the banking industry started in the early 1990s have been continued till now. The paper makes an effort to first gather the major reforms measures and policies regarding the banking industry by the govt. of India and the

Central Bank of India (i.e. Reserve Bank of India) during the last fifteen years. Secondly, it also studies the major impacts of those reforms upon the banking industry. A positive respond is seen in the field of enhancing the role of market forces, regarding prudential regulations norms, introduction of CAMELS supervisory rating system, reduction of NPAs and regarding the up gradation of technology. But at the same time the reform has failed to bring up a banking system, which is at par with the international level, and still the government mainly controls the Indian banking sector.

Kavitha. N (2012), discussed that the compliance with Basel-II norms can put banks in a better position to manage credit risk, market risk and operational risk. Further the author explained the financial and non-financial risks and the various pillars of Basel II and concluded that by complying with the norms given by the Bank for International Settlement (BIS) regarding the implementation of Basel II, they can put banks in a better position to fight with the primarily three risks i.e. Credit Risk, Market Risk and Operational Risk. The author also discussed that in order to put Indian banks on an equal footing to that of international banks and to improve credibility; compliance to Basel II is must.

Rajan Singenellore (2012), discussed the state of Credit Risk Management Practices in the commercial banks in India. The study also makes an attempt to identify credit risk management approaches followed by Indian banking system and how these approaches are reflected in their credit risk management practices. The study further makes an attempt to relate some of the characteristics of banks (size, ownership, geographical spread) with different credit risk management practices. The study concluded with a list of elements/techniques/tools that are currently not deployed, or are inappropriately employed in the current CRM framework of the commercial banks in India.

Arindam Bandyopadhyay (2012), focused on the Basel norms, at some level, aimed to create a global banking system that is fairly homogenous. While this very aim purports to build a more robust financial system, it may actually be its undoing. Simply speaking, a diverse group is an advantage since an attack only affects a certain percentage of its

constituents. The Basel norms also fail to consider national competencies. They have taken a global scenario where individual countries vastly differ in their extent of development. In an age where international banks are so prevalent, such differences across geographies can become tricky to deal with. The Basel accords need to incorporate, in some form, the element of national competencies so as to create a level-playing field. While the Basel accords aim to bring along a host of benefits, they inevitably imply high costs for the adopting nations. This is especially true because there is no single set of dates corresponding to the implementation of a particular Basel regulation (say, Basel III) worldwide. This lack of synchronization in the adoption of the norms dilutes their efficacy. The proposal of phases and timelines for implementation should be put forth in a manner that ensures a fair amount of coordinated adoption.

Shetty and Sandesha (2012), in their paper carried out an empirical study to predict the determinants of the credit risk in the Indian commercial banking sector by using an econometric model. The model by utilizing a panel data at bank level for 22 public sector banks and 15 private sector banks has shown some unique determinants of the credit risk in the Indian commercial banking sector. The model used in the study has a high R square for both public and private sector banks which is a reflection of the fitness of the model and its predictability. The results showed that the lagged nonperforming assets had a strong and statistically significant positive influence on the current nonperforming assets. There is a significant inverse relationship between the GDP and the credit risk for both public and private sector banks. The study reveals that both macroeconomic and bank specific factors play crucial role in determining the credit risk of commercial banking sector.

Debrach and Sukanya Goyal (2012) emphasized on management of non-performing assets in the perspective of the public sector banks in India under strict asset classification norms, use of latest technological platform based on Core Banking Solution, recovery procedures and other bank specific indicators in the context of stringent regulatory framework of the RBI. Non-performing Asset is an important parameter in the analysis of financial performance of a bank as it results in decreasing margin and higher provisioning

requirements for doubtful debts. The reduction of non-performing asset is necessary to improve profitability of banks.

Chaudhuri,S. (2012), analysed a sample of 75 emerging markets and traced the causes of financial distress and the reasons for interest rate liberalization in the period 1975 to 1997. A boom in domestic credit was a major cause of financial distress; macro-economic policies leading to excessive loaning out, and financial overheating generally did set the stage for future economic problems. Domestic interest-rate liberalization often accompanied the excessive lending activities of banks.

Kavitha. N (2012) emphasized on the assessment of nonperforming assets on profitability its magnitude and impact. Credit of total advances was in the form of doubtful assets in the past and has an adverse impact on profitability of all Public Sector Banks affected at very large extent when nonperforming assets work with other banking and also affect productivity and efficiency of the banking groups. The study observed that there is increase in advances over the period of the study. However, the decline in ratio of Non-performing Assets indicates improvement in the assets quality of SBI groups, Nationalized Banks and Private Sector Banks.

Tarun, Chekol, and Mutwol (2012) analyzed the bank-specific, industry-specific and macroeconomic determinants of Net Interest Margins of 44 Kenyan Banks using pooled OLS and Fixed Effects (Panel Data) Banks for the period 2000 to 2009. They found that those operating expenses had a positive and significant impact on Net Interest Margin of the commercial banks in Kenya. Also, Credit Risk tended to be positively associated with Net Interest Margin, and market concentration influenced Net Interest Margins adversely. A negative concentration effect found in the Kenyan market may be attributed to the high concentration of foreign banks which exhibited lower Net Interest Margins. Therefore, a market mainly characterized and dominated by foreign banks, had lower Margins because of superior management or better production technologies in Kenya.

A. Singh (2012) in his research study examined the impact level of credit risk management towards the profitability of Indian commercial banks. To examine its impact level the researcher had used multiple regression models by taking 11 years return on asset (ROA), non-performing asset (NPA) and capital adequacy ratio (CAR) from each bank. The researcher had collected data from RBI annual report since 2003 to 2012 for regression purpose.

Prasanna K Baral (2012) their study was basically a hypothetical case study of minimizing credit risk through the use of Credit Derivatives by Indian banks because there is currently very little credit derivatives study exist in India. The researcher has given importance to Credit Derivatives against credit risk in things like Credit-line management, Regulatory arbitrage similarly, the factors that motivate market participants to sell protection against credit risk are, Funding arbitrage and Product restructuring.

Shetty and Sandesha (2012) tried in their study was to assess the non – performing assets of State Bank of India and Karnataka Bank and its impact on profitability and to see the relation between total advances, Net Profits, GROSS & NET NPA. The study used the annual reports of the Banks for the period of five years from 2009- 10 to 2010-12. The data has been analyzed by using tables and coefficient of correlation. The decline of NPA is essential to improve the profitability of banks. Advances provided by banks need to be done pre-sanctioning evaluation and post-disbursement control to constrain rising non-performing assets in the Indian Banking sector. While analyzing the impact of NPA level on SBI they derived the conclusion that there is a positive relation between Net Profits and NPA. It simply means that as profits increase NPA also increase. It is because of the mismanagement on the side of bank.

Vikram Swaroop in his paper on Risk Based Pricing: Are India's Credit Market moving towards this Paradigm? (Journal of Banking and Finance ICFAI Vol 3) defined risk-based pricing, its pros and cons for successful growth of credit market, action plan to implement it and the challenges in India to implement it. Researcher studied the Reserve Bank of India Annual Reports which shows that from time-to-time Reserve bank of India

and Government of India took following steps in order to improve the health of banking structure. They dismantle the control and deregulation of commercial banks from finance ministry and RBI. E- Banking and VRS was introduced, Banks were allowed to seek fresh equity from the public retaining government share of equity capital at 51%, Risk assessment and risk Management, Corporate debt restructuring activating the credit information bureau, Prompt corrective actions were introduced. Debt recovery tribunals were set up and introduced prudential norms as conveyed by Basel Accord of 1988 applicable to Indian banks. Fair practices code for lenders was introduced. Banks have also been advised recently to address market risks in structured manner by adopting a more comprehensive Asset-Liability Management Practices with effect from April 1, 1999.

Reddy, A. (2012) summarizing the international experience about Net Interest Spreads and profitability from late 1990s to 2002, using Ratio Analysis, found that the financial systems in the developing countries demonstrated comparatively high and persistent Net Interest Spreads than the developed countries due to the fact that cost of poor-quality loans was shifted to bank customers through higher Net Interest Spreads.

Zoli (2011) stated that an increase in Net Interest Spreads signaled that banks are facing riskier borrowers and hence charging them higher rates of interest, or that banks needed to cover larger expenses due to loan losses. Hence, a decline in spreads is interpreted as an improvement in efficiency. Also, for the undercapitalized banks it was concluded that they faced distorted incentives in extending new loans and were prone to excessive risk-taking and high Net Interest Spreads. Implicit taxes such as Cash Reserve Ratio (CRR), Statutory Liquidity Ratio (SLR) and Priority Sector Lending are relatively greater in the developing countries, which is also a cause for higher Net Interest Spreads. It was further stated that in the long-run, the banking system should be stable and efficient to enhance the overall development of the country. Stability clearly requires sufficient banking profitability, while economic efficiency requires Net Interest Spreads that are not too large. An essential condition to formulate effective banking policies is to understand the determinants of bank profitability and Net Interest Spreads (Asli and Harry 1999).

Ghosh (2011) stated that to the extent bank size acted as a proxy for diversification, it seemed likely that bigger banks could exhibit higher stability. However, his statistical results indicated negative impact of bank-size on banking stability index or larger banks had higher credit risk.

Prasanna K Baral (2011), in his article presented about the various types of risk the banks face in the current scenario. It speaks about the need for risk management and the process of risk management. The tools required for risk control such as diversification of business, insurance and hedging, fixation of exposure ceiling and transfer of risk to another party on time, and securitization and reconstruction are also mentioned. It also talks about the structure of BASEL II. Capital ratio is defined as, Total capital – Tier I + Tier II + Tier III and Credit risk + Market risk + Operational risk. This is minimum capital requirement for banks to manage credit risk. It also talks about the implementation challenges faced by Indian banks in light of risk management, such as implementation of new framework which requires substantial resources, increase in capital requirements due to new norms, data intensiveness of risk management, building models and forecasting and trained and skilled manpower.

Thiagarajan and Ramchandran (2011) a study was carried out to measure the credit risk component of the Indian Scheduled Commercial Banking Sector by using data of ten years (2001-2010). It illustrates how credit risk ratios can be used to measure the credit risk in the banking sector. The results of the study indicated a consistent increase in the total loans to total assets ratio and the total loans to total deposits ratio for both public and private sector during the period of study. There was a gradual decrease in the ratio of nonperforming loans to total loans for both public and private sector banks from 2001 to 2008 but there has been a gradual increase from 2009 to 2010 and this is significantly higher for private sector banks as compared to public sector banks. Also, the study indicated a significantly drastic increase in the total loans to equity ratio in the public sector banks in the last four years. It also indicates that banks can have their own risk management practices but has to be appropriately disclosed.

Dr. P. Ven and P. Sree Devi (2011) explained Credit risk management is not an 'off-the-shelf product. It is a 'whole-time' and 'organization-wide' function. Common-sense dictates that people responsible for targets under business-growth are ill suited to address 'risk' inherent to credit and its management. Credit risk management should therefore be separated form and sufficiently be independent of the business lines. Risk Management can be defined as systematic identification and analysis of the various loss exposures faced by a firm/individual and the best methods of treating the identified loss exposures consistent with the firms'/individuals' objectives. The choice of appropriate strategies for control of credit risk by individual banks depends on their priorities and risk appetites.

Dr. Rohit R. Manjule (2011) analyzed in his research paper that Non-Performing Assets (NPA) is one of the major concerns for banking system around the globe and Indian Banking system is not an exception to this universal phenomenon. He concluded that it is right time to take suitable and stringent measures to get rid of this problem. An efficient management information system should be developed. The bank staff involved in sanctioning the advances should be trained about the proper documentation and charge of securities and motivated to take measures in preventing advances turning into NPA and constant following up and monitoring of loans after disbursement.

Arpa (2011) studied the effects of business cycles on Austrian Banks" Risk Provision and Earnings in 1990s.During a period of falling real GDP growth, risk provisions increased. Also, rising real estate prices lead to higher provision allocation, while falling inflation depressed the provisions. Macro-economic variables such as consumer prices and real estate interest rates were significant in explaining the profitability of the Indian Banks.

Singh (2011) in his study said that the origin of the problem of burgeoning NPA's lies in the system of credit risk management by the banks. Banks are required to have adequate preventive measures in fixing pre-sanctioning appraisal responsibility and an effective post-disbursement supervision. Banks should continuously monitor loans to identify accounts that have potential to become non-performing. Banks have to be given powers

of inspection of the use of loans and the loan should be disbursed on the point of purchase by the borrowers to ensure proper utilization of deposits. Banks may also be given powers to recover loans from the guarantor of the borrower.

K Vaidynathan (2011) in his book exclusively targeted the practical needs of Indian bankers. It lays more emphasis on the ground realities of Indian banking and enunciates principles and guidelines of credit risk management based on real-life situations.

Thiagarajan, Ayyappan and Ramachandran (2011), tried to investigate the micro-level link between judicial quality and economic outcomes. It uses a loan-level data set from a large Indian bank to estimate the impact of a new quasi-legal institution, Debt Recovery Tribunals, which are aimed at accelerating banks1 recovery of nonperforming loans. It is found that the establishment of tribunals reduces delinquency in loan repayment by between 3 and 11 percent. The effect is statistically significant within loans as well: for the same loan, instalments that become due after the loan becomes treated are more likely to be paid up on time than those that becomes due before. Furthermore, interest rates on loans sanctioned after the reform are lower by 1.4 to 2 percentage points. These results suggest that legal reform and the improved enforcement of loan contracts can reduce borrower delinquency, and can lead banks to provide cheaper credit. Thus the paper illustrates a microeconomic mechanism through which improvements in legal institutions might affect credit market outcomes.

Thiagarajan and Ramchandran (2011), tried to provide basic objective behind banking risk management. What are main external and internal reasons banks facing and how one bank can overcome form that.

Dr. P. Ven and P. Sree Devi (2011), in his book explained that banking industry in India has undergone a transformation since the beginning of liberalization. Interest rates have declined considerably but there is evidence of under-lending by the banks. The "social" objectives of banking measured in terms of rural credit are, expectedly, taking a back seat. The performance of the banks has improved slightly over time with the public sector banks doing the worst among all banks. The banking sector as a whole and particularly

the public sector banks still suffer from considerable NP As, but the situation has improved over time. New legal developments like the SARF AESI Act provide new options to banks in their struggle against NP As. The adoption of Basel-II norm however implies new challenges for Indian banks as well as regulators. Over time, the Indian banking industry has become more competitive and less concentrated. The new private sector banks have been the most efficient though the recent collapse of Global Trust bank has raised issues about efficiency and regulatory effectiveness.

Dr. Rohit R. Manjule (2011) in his research has applied LVQ artificial neural networks accurately to South African consumer credit risk analysis in his paper Credit Risk Analysis using Artificial Intelligence: Evidence from a Leading South African Banking Institution. This study investigated if relationships between biographic and demographic characteristics of consumers and their credit risk weights existed. Authors investigated the effect of varying the ANN network architecture on its ability to detect credit risk at the customer level. The relationship exists between age groups, marital status, race groups, employment and the credit risk grades of customers.

Singh (2011), highlighted a detailed description and conceptual understanding of credit risk management and Basel II. It discussed positive and negative aspects of BASEL II norms for Indian banking. How BASEL II has affected Indian Banking.

Nayan J and M. Kumarswamy (2011), discussed the problem of losses and lower profitability of Non-Performing Assets (NPA) and liability mismatch in banks and financial sector depend on how various risks are managed in their business and also focused the factors contributing to NP A, the magnitude of NP A, reasons for high NP A and their impact on Indian banking operations. Besides capital to risk weight age assets ratio of public sector banks, management of credit risk and measures to control the menace of NP As are also discussed. The lasting solution to the problem of NPAs can be achieved only with proper credit assessment and risk management mechanism. It is better to avoid NP As at the market stage of credit consolidation by putting in place of rigorous and appropriate credit appraisal mechanisms.

Shenoy Mohane and Singh (2011) helped in providing a profound overview of framework of credit risk management in commercial banks. Findings of their survey found that securitization ordinance played an important role in banks credit risk management, board of directors is responsible for the approval of credit risk policy, risk rating techniques followed by credit approval authority, prudential limits, and loan review policy is used by the maximum banks in India. Prudential limits, credit approval committee and loan review policy are used as credit risk management techniques. Portfolio management, RAROC, collateral, credit audit and problem loan management are used as a tool of credit risk management in their bank. Above given literature helps in producing a comparative study in respective country's credit risk management and also help in finding out the loopholes and lacunae in their credit risk management procedures in their banking sectors.

Gilbert, Meyer and Vaughan (2011) emphasized that banks can be viewed as firms producing various outputs like loans, advances, investments etc. after utilizing inputs like deposits, borrowings, etc. As commercial organization they would certainly like to maximize their profits to the extent possible. A theoretical model of a bank as a multi-product firm was used which derives the imputed values of various balance sheet items and profit parameters to make comparison between the studies conducted in 1985 and 1994-95.

Ross Levine (2011), in his article discussed various aspects in which credit risk usually measured through bad loans, problem loans or provisions for loans losses is related to efficiency.

Panos, Angelopoulos and Panos Mourdoukoutas (2011), in their working paper examined the potential contribution to bank supervision of a model designed to predict which banks will have their supervisory ratings downgraded in future periods. Bank supervisors rely on various tools of off-site surveillance to track the condition of banks under their jurisdiction between on-site examinations, including econometric models. One of the models that the Federal Reserve System uses for surveillance was estimated to

predict bank failures. Because bank failures have been so rare during the last decade, the coefficients on this model have been "frozen" since 1991. The number of banks downgraded to problem status in recent years has been substantially larger than the number of bank failures. During a period of few bank failures, the relevance of this bank failure model for surveillance depends to some extent on the accuracy of the model in predicting which banks will have their supervisory ratings downgraded to problem status in future periods. This study compared the ability of two models to predict downgrades of supervisory ratings to problem status. Firstly, the Board staff model, which was estimated to predict bank failures, and secondly, a model estimated to predict downgrades of supervisory ratings. They found that both models do as well in predicting downgrades of supervisory ratings for the early 1990s. Over time, however, the ability of the downgrade model to predict downgrades improved relative to that of the model estimated to predict failures. This pattern reflected the value of using a model for surveillance that can be re-estimated frequently. The study further concluded that the downgrade model may prove to be a useful supplement to the Board's model for estimating failures during periods when most banks are healthy, but that the downgrade model should not be considered a replacement for the current surveillance framework.

Kurosaka, Shoichi (2011), concluded Credit risk is the possibility that the actual return on an investment or loan extended will deviate from that, which was expected credit risk as losses from the refusal or inability of credit customers to pay what is owed in full and on time. The main sources of credit risk include, limited institutional capacity, inappropriate credit policies, volatile interest rates, poor management, inappropriate laws, low capital and liquidity levels, directed lending, massive licensing of banks, poor loan underwriting, reckless lending, poor credit assessment.

Ferguson (2011), in his article empirically assessed competing theoretical views on a century old policy debate: Are bank-based or market-based financial systems better for promoting long-run economic growth? Since 19th century, many economists have argued that bank-based systems are better at mobilizing savings, identifying good investments,

and exerting sound corporate control, particularly during the early stages of economic development and in weak institutional environments.

Hakenes, Hendrik (2011), found that inadequate bank capital regulation, intense market competition, and an adverse regulatory, institutional and legal environment are the other most important factors which lead to rise in defaults leading to the banking crisis.

Pricewaterhouse Coopers (2011), concluded that because of weak transparency in banks and financial institutions makes their asset risks opaque; hence stock market participants and professional credit-rating agencies, such as Moody's, and Standard and Poor's encounter difficulties in measuring banks' creditworthiness and risk exposures.

David Shimko (2011) tried to explain the credit risk management procedure during traditional credit model and modem credit model. The functional approach to the credit process along with the credit risk transfer mechanism to manage credit risk management was also discussed.

Nabila Zribi1 and Younes Boujelbène (2011) studied the Russian Banking Sector in their paper. They concluded that the Russian banking sector has experienced enormous growth rates during the last 6- 7 years in 2008. The rapid growth of assets has, however, contributed to a decrease in the capital adequacy ratio, thus influencing the ability of banks to cope with risk and it was also found that regional banks are engaged in significantly more risk-taking than their counterparts in Moscow.

Ross Levine (2011), discussed that Risk management, although of major importance in the banking industry in practice plays only a minor role in the theory of banking. Risk managers specialists that can find out correlations between risky assets - endogenously take over typical functions of banks like granting loans, also consult on financial questions with firms that are threatened by bankruptcy, and they sign tailor-made hedge transactions with these firms. Delegation costs are innately low of banks assume the function of risk managers in an economy and Risk management can be seen as a core competence of banks.

Memmel and Schertler (2011), using the Ordinary Least Squares (OLS) technique, on the dataset of German Banks for the period 1999 to 2010, asserted that the price and weight changes explain more than 40% of the changes in the Net Interest Margin of the banks, where price changes are far more relevant than weight changes. Price changes incorporate all changes in premiums for banks' transformation functions, i.e., market-wide changes in the premiums for term, liquidity and risk transformations that give compensation to financial institutions for credit risk, interest rate and liquidity. Besides, weight change captured changes in the banks' balance-sheet structure, i.e., the changes in the on-balance risk exposure which contribute to the overall change in 42 the Net Interest Margin. The third component was the idiosyncratic change in a bank's Net Interest Margin capturing bank-specific deviations from the market-wide bank rates. Next, they attempted to link the price and weight changes to the use of Derivatives. Changes in the Net Interest Margin of banks using derivatives depend less on the weight and price changes than the ones of non-users. This finding is in line with the argument that Interest Rate Derivatives are majorly used to reduce the risk of on-balance exposure of banks. Finally, banks behave procyclically, i.e., weight and price changes are strongly and positively correlated; the correlation between weight and price changes is greater for banks using derivatives than for banks not using derivatives.

Delis and Kouretas (2011), using Panel Random Effects upon 18000 annual observations on European Banks for the period 2001 to 2008, contended that strong empirical evidence existed about the fact that low interest rates increased banks‟ risk-taking substantially. Also, the distributional effects of interest rates on bank risk-taking due to individual bank characteristics revealed that the impact of interest rates on risk-prone assets diminished in the case of banks with higher equity capital, and was greater for banks with higher off-balance sheet items.

Ewijk and Arnold (2011) analyzed the determinants of Net Interest Margins in the U.S. Commercial Banking Sector using factor analysis with bank-level data during the years 1992 to 2007. Many banks in the U.S. moved from a Relationships-Oriented (ROM) to a Transactions-Oriented Model (TOM) of financial intermediation, because of their ability

to invest in customer-specific information which was „soft" in nature. These locally focused banks had the potential to earn higher Net Interest Margins by paying a lower interest rate to a loyal base of core depositors in the case of Relationship-Oriented Model. Also, they can charge high interest rates to an information-problematic category of borrowers, which otherwise would have problem in obtaining funding from the capital markets, and over which they have substantial market power due to information-based switching costs. In contrast, Transaction Banks focus mainly on the effective use of „hard" information and the 34 commoditization of financial services" provision. Transaction Banks take advantage of the economies of scale concept in the marketing, production, securitization and servicing of „transaction loans". These banks operate with lower unit costs, but are likely to earn lower Net Interest Margins as they are primarily selling financial commodity products in highly competitive markets. As a result, the margins for transaction banks are likely to be smaller.

Moorad, C Chaudhary (2011), in his book emphasized the banking credit emerging trends and also discussed the problem of non-performing assets during the 1990s decade.

Dharlwal and Goel (2011), explained the determinants of credit risk in Indian banks and found that not only micro-economic variables but also macroeconomic variables that affect the banking sector credit risk problem. Literature on Indian banking sector especially on non-performing assets examines the evolutionary development of Non-Performing Assets in India, its causes and effect on Indian state and not much has been discussed about Basel-II a credit risk management strategy and its impact on full capital account convertibility and profitability of banking sector which my study would like to focus.

Jeffrey R. Bohn and Roger M. Stein (2011), in his paper focused on improving Risk Management in the Russian Banking Sector has tried to show the current situation of risk management in Russian banking sector that helps in having clear understanding of present status of risk management in Russian banking sector.

Jens Hilscher and Mungo Wilson (2011), highlighted obstacles in credit risk management systems by banks – lack of resources, disintegration of systems across departments, inconsistencies in risk-rating approaches, data management, and stringent regulatory requirements.

Ciby Joseph (2011), made a thorough study of the Regulatory reform requirements in the modern context after the global meltdown. He started by summarizing the basic principles that should be covered in the financial reforms. He reviewed the progress achieved by the Financial Stability Board (FSB) and Basel Committee on Banking Supervision. He discussed the unresolved issues like the relationship between competition policy and financial stabilization policies. He throws particular light on the oft quoted 'Too-Big-To-Fail' (TBTF) concept. He outlined measures to improve the supervision of capital markets to protect consumers and Investors. The articles discussed at length the revision of Bank Capital Requirements and Accounting Procedures, revising the role of Credit Rating Agencies, the supervision and regulation of Hedge Funds, Commodity Funds and Private Equity Funds. Complex issues of Derivatives Regulation, Mortgage Securitization etc. have also been discussed and the author came out with suggested methods to address these difficult issues.

Ron Wells (2011), examined the determinants of bank credit risk in Tunisia, being an emergent country. Their sample includes ten commercial banks over the period of 1995 to 2008. The paper taken into accounts both macroeconomic factors and microeconomic variables that are likely to influence credit risk. Overall, the results show that the main determinants of bank credit risk in Tunisia are: ownership structure, prudential regulation of capital, profitability and macroeconomic indicators.

Pradeep Raje (2011), this paper explored the sources of credit risk in Chinese commercial banks, analyzes Chinese commercial banks credit management experience and their insufficiency, and puts forward some countermeasures to control the credit risk of commercial banks in China under the new situation.

Bakshi.G D Madan (2011), studied to what extent may policy reforms aimed at increasing competition among banks affect the stability of individual institutions and the whole system itself? And does this relationship work differently for distinct types of banking systems? The link between bank competition and financial stability has been widely debated in the theoretical and empirical literature, with varying results and conclusions for policy recommendations. In addition, the global financial crisis has prompted a broad discussion of the structural and regulatory policies that can improve the resilience of the banking sector, in both advanced economies and developing countries.

Upadhyay (2011), studied that public sector banks are losing market share, their profitability is being seriously squeezed and their sovereign support is becoming open to question. Since Average Indian bank does not meet the regulatory obligation with respect to priority sector lending during the period of analysis so there is a need to strengthen banking structure as a whole.

Das, A. and S. Ghosh (2011), made an attempt to have overview of the bank's risk management and suggest a model for pricing the products based on credit risk assessment of the borrowers. He concluded that good risk management is good banking, which ultimately leads to profitable survival of the institution. A proper approach to risk identification, measurement and control will safeguard the interests of banking institution in long run.

Khanna, Vijay K. and V. S. Kaveri (2011), analyzed the impact of directed credit under priority sector on the profitability of commercial banks in India. She brought into light the matters related to the directed credit which was not solely responsible for the deterioration in the profitability but also the poor quality of the portfolio of these financial institutions. The researcher, however, has called for the re-appraisal of the credit policy of India in the lines of the policies implemented in East-Asian Countries.

Ha-Thu Nguyen (2011), their paper investigated the information in corporate credit ratings and examined the extent to which firms' credit ratings measure raw probability of default as opposed to systematic risk of default, a firm's tendency to default in bad times. They found that credit ratings are dominated as predictors of corporate failure by a simple model based on publicly available financial information ('failure score'), indicating that ratings are poor measures of raw default probability. However, ratings are strongly related to a straight-forward measure of systematic default risk: the sensitivity of firm default probability to its common component ('failure beta'). Furthermore, this systematic risk measure is strongly related to credit default swap risk premia.

Gup, Kolari and Fraser (2011) reviewed Asset Liability Management in USA‟s Commercial Banking in the context of Risk Management from 1990 to 2003 and found it to be short-run in nature. Aggressive Asset /Liability Management focuses on increasing the Net Interest Margin by altering the portfolio of the institution and Defensive Asset/Liability Management focuses on insulating the Net Interest Margin by preventing an increase or a decrease in it due to changes in the interest rates. It was concluded that the changes in the Net Interest Margins can be categorized into:(a) changes caused due to interest rates; (b) changes caused due to volume of funds, and (c) changes caused due to the variation in the mix of assets and liabilities. Asset/ Liability Management focuses on interest rate changes of the net interest income. A common measure of Asset/ Liability Management is the Gap Analysis i.e., the 37 difference between the volume of interest-sensitive assets and interest-sensitive liabilities. The emphasis of the Gap Analysis is on the profitability and costs of assets and liabilities rather than on the value of assets and liabilities. If a bank had a greater volume of interest-sensitive assets than interest-sensitive liabilities, then it was termed as Asset- Sensitive. Also, if a bank had more interest-sensitive liabilities than interest sensitive assets, then it was termed as Liability-Sensitive. An Asset-Sensitive Bank experienced a decline in Net Interest Margins when interest rates declined and a Liability-Sensitive Bank, a decline in Net Interest Margins when interest rates increased. The gap is calculated for a variety of time periods and sub - periods resulting in a cumulative and an incremental gap.

Saremi, H. (2011) highlighted the fact that due to competitive aggravation and contortion of work and business environment, the risk factor has increased and there will be ever increasing dangers in the Financial Sector as analysed for the period 1990 to 2011 globally. Financial managers at present are members of the Risk Committee and sometimes they undertake the main responsibility of the Risk Management Department of the Scheduled Commercial Banks. The financial management thus has to undertake the larger duty of evaluating future risks, determine the effect of different kinds of risks and devise an appropriate strategy, determine profits, and analyze and report risk to the interested parties. The strategy used for evaluating and tackling recession by the concerned department in financial institutes encompasses reduction of interest rates, new liquidity infusion to financial institutions, and purchasing of problem financial assets.

Kamath, K., Kohli, S., P. Vinod Shenoy and Ranjana Kumar (2011), examined the impact of banking regulations, concentration, and institutions on Net Interest Spreads by taking bank level data across 72 countries and using Generalized Least Squares with Random Effects, and country-specific variables for the time period 1995 to 1999. It was observed that individual bank characteristics explain a substantial part of within-the-country variations in Bank Interest Spreads, whereby high margins usually tend to be associated with small banks; banks that hold a low fraction of liquid assets; banks that hold a relatively low amount of capital; banks without substantial income from feebased activities, and banks with a large market share. This finding is consistent with the view that banks that are relatively large compared to the market can exert market power to increase rents and income.

Dutta (2011) in their article on Non-Performing Assets: Magnitude Causes and Corrective Measures, focused on the magnitude, causes and corrective measures of non-performing assets.

Madtha, Roy and Shah (2010), studied that the reduced-form models briefly presented above to allow for a flexible correlation between the risk-free rate, the default probability and the recovery rate. Based on some preliminary evidence published by rating agencies, they force recovery rates to be negatively associated with default probability.

Mittal (2010) focused on historical framework, evolving nature of banking in Russia since the breakup of Soviet Union, reforms that would help the banks to play an adequate role in nation's sustained growth and comparison with existing monetary policies.

Sujata Visaria, (April 2010), investigated the determinants of interest rate spread in the Indian Banking system using a combination of bank specific, bank industry specific and macro-economic factors. The author used the narrow and wide definitions of spreads, the paper found that among the bank specific factors, operating expenses, other income and provisions were the key determinants. Among the bank industry specific factors, the yield on 91-day Treasury bills remained a significant factor influencing spreads. The study concluded that the operating expenses, other income and inflation were the important variables explaining spreads.

Bhatt, Ghosh and Rita (2010), used Generalized Least Squares Estimator with Random Effects for 1200 banks for 47 countries during 1997 to 1998 and found that restrictions on foreign banks entry – as proxied by „fraction foreign denied" – is positively correlated to Net Interest Margins. The restrictions on foreign banks" entry, boosts the gap between interest received and interest paid as a fraction of interest earning assets. Further, the findings are confirmed when using instrumental variables to proxy for the differences in national institutions that use different policies towards foreign banks. These instrumental variables result imply that restricting foreign banks entry increases Net Interest Margins, and with a caution that this relationship may reflect even deeper institutional characteristics.

Don M Chance (2010), examined that capital productivity can be increased with proper Risk Management and Asset and Liability management system in place. In the study, important areas identified for detection of NPAs were Credit Risk Management, Internal checks and system for Early Identification of NPAs, effective monitoring of restricted loans and improvement in legal framework. The author believed that though significant progress has been made in NPA management, much still needs to be done in areas as credit risk management, identification and correction of NPA problem in a time bound manner. Further, this study suggested that the banks should introduce some international banking practices for NPA management.

Hyytinen (2010), in his article argued that the theory of organizational structure of banks affects their lending behaviour. Decision makers can become less risk averse and even risk seeking if they find that they are operating below target or aspiration levels. This theory also says that although, risk taking remains the core activity of banks, it has been proven that excessive risk taking is the principal bank default factor.

Liebig and Porath (2010) presented the results of the international benchmark survey into credit risk management in the financial services industry. The risk management marketplace is currently very active both on the supply side (solutions providers) and the demand side (financial institutions themselves). There are a lot of new approaches, and there is a proliferation of tools, techniques and methodologies on the market. One of the key industry drivers is the advance of the regulatory compliance schedule. Yet organizations are taking a variety of paths toward better credit risk management. This study was meant to explore the relationship between regulatory requirements and the business drivers behind credit risk programs. What we found was surprising: the demand side of the industry (in particular the risk management function within financial institutions) has Avery strong awareness of the financial and business leverage that can be gained from credit risk management.

Pyle, H. David (2010) mentioned that it is essentially unchanged from ancient Egyptian times: now, as then there is always an element of uncertainty as to whether a given borrower will repay a particular loan. Ever since, banks as most of us know them were organized in Florence seven hundred years ago; they have been society's primary lending institutions.

Fadzlan and Muzafar (2010), using the Data Envelopment Analysis Method, highlighted the impact of the Post-Asian Financial Crises (1997) on Net Interest Spreads in Thailand, and the efficiency of the Thai Banking Sector during the period 1999 to 2008. The sharp decline in its domestic currency had damaging effects on its leading banks‟ balance sheets and their capital adequacy. In response to the depreciating exchange rate, the Bank of Thailand (the Central Bank of Thailand) raised interest rates on deposits. This resulted in a decline in bank revenues, as banks could not pass on the higher interest rates to the distressed corporate borrowers, thus ending negative Net Interest Spreads, and subsequently a reduction in the net income of banks. Major structural changes have occurred in the Thailand Banking Sector now. Prior to the Asian Financial Crisis in 1997, the Banking Sector had been sheltered from foreign competition. In the aftermath of the crisis, the government launched two major strategies to revive the financial sector. First, several ailing financial institutions were nationalised or merged with the other Thai commercial banks. Second, the banking sector was re-capitalised by relaxing regulations on foreign shareholding limits in the Thai Commercial Banks.

Altman, Edward I., Caouette, John B., Narayanan, Paul (2010) in his book discussed the reason why risk management is needed. It outlined some of the theoretical underpinnings of contemporary bank risk management, with an emphasis on market and credit risks. It also gives a brief overview of various risks like credit risk, market risk, operational risk and performance risk.

Kunt, Asli and Ross Levine (2010), using Correlation and Regression for 107 countries from 1998 to 2001 opined that regulations that encourage private monitoring of banks are associated with better banking sector outcomes like overall banking development, lower Net Interest Spreads and smaller Non-Performing Assets. However, it was concluded that regulations that foster private monitoring do not necessarily imply a reduction in the likelihood of suffering a major banking crisis. Also, it was highlighted that there is no robust link between the regulations and restrictions on bank activities and Net Interest Spreads.

Duffee and Zhou (2010), in their book discussed that banking sector that provides various kinds of credit also suffers from various risks like interest rate risk, foreign exchange risk, price risk, operational risk, credit risk and reputation risk. These risks exist in banking sector in nominal range but they can be dangerous if exists beyond a nominal range. Credit risk is the risk that a change in the credit quality of counter-party will affect the value of a security or a portfolio. It is the oldest form of risk in the financial markets.

Jose M Pastor (2010) examined the credit risk rating mechanism at US banks in their paper. The paper highlighted the architecture of Bank Internal rating System and operating design of rating system and made a comparison of bank system relative of the rating agency system. They concluded that banks internal rating system helps in managing credit risk, profitability analysis and product pricing.

Drehmann, Sorensen and Stringa (2010), in their article on Risk Management and Regulation in Banking studied that Risk is intrinsic to banking. However, the management of risk has gained prominence in view of the growing sophistication of banking operations, derivatives trading, securities underwriting and corporate advisory business etc. Risks have also increased on account of the on-line electronic banking, provision of bill presentation and payment services etc. The major risks faced by financial institutions are of course credit risk, interest rate risk, foreign exchange risk and liquidity risk. Credit risk management requires that Banks develop loan assessment policies and administration of loan portfolio, fixing prudential per borrower, per group

limits etc. The tendency for excessive dependence on collateral should also be looked into. The other weaknesses in Credit Risk Management are inadequate risk pricing, absence of loan review mechanism and post sanction surveillance. Interest rate risk arises due to changes in interest rates significantly impacting the net interest income, mismatches between the time when interest rates on asset and liability are reset etc. Management of interest rate risk involves employing methods like Value-at-Risk (VAR), a standard approach to assess potential loss that could crystallize on trading portfolio due to variations in market interest rates and prices. Foreign Exchange risk is due to running open positions. The risk of open positions of late has increased due to wide variations in exchange risks. The Board of Directors should law down strict intraday and overnight positions to ensure that the Foreign Exchange risk is under control.

Michael Gilroy Dresden and Paderborn (2010), in their paper, highlighted that credit and interest rate risk in the banking book as the two most important risks faced by commercial banks. In this paper they derived a consistent and general framework to measure the riskiness of a bank which is subject to correlate interest rate risk and credit risk. The framework accounted for all sources of credit risk, interest rate risk and their combined impact not only on the bank's economic value but also on its future earnings and capital adequacy. The simulation highlighted that it is fundamental to measure the impact of correlated interest rate and credit risk jointly as well as on the whole portfolio of banks, including assets, liabilities and off-balance sheet items.

Ketkar, K. and S. Ketkar (2010), emphasized that the basic objective of banking supervision was to ensure that banks are financially sound, well managed, and that they do not pose a threat to the interest of their depositors. The emphasis of supervision, after the initiation of reforms (1991) had shifted from the traditional CAMELS (Capital, Assets, Management, Earnings, Liquidity and Interest Rate Sensitivity Model) to a more Risk-Based Approach as per Basel II (2004) norms to ensure financial stability which encompass risk analysis, using a „three-pillar" concept, that is, Minimum Capital Requirements, Supervisory Review, and Market Discipline.

Colquitt, Joetta (2010), explored the impact of Capital Adequacy Requirements on monetary policy effectiveness. He further reviewed main theories on bank lending supply through which capital requirements affect monetary policy effectiveness, and found that a binding risk-based capital requirement affect the strength of monetary shocks. Moreover, with a binding capital requirement, the effects on bank lending supply depend on the size, the capital level, the balance sheet liquidity of banks and the capital distribution and market structure in the banking sector. He also reviewed empirical findings which suggest that capital requirement is one reason for the credit crunch in the U.S. and Japan. After that, the predictions on the impact of the Basel II on the effectiveness of monetary policies were discussed.

Abel Mateus (2010), presented a structural debt valuation model that links default probabilities and recovery rates of corporate securities to asset market liquidity. This paper believed that this linking was advantageous for risk management and regulation of financial institutions as it provides a method of calibrating the relationship between Probability of Default (POD) and Loss given Default (LGD). Two innovations in the paper were the placing of the default point in a model of debt valuation into general equilibrium and conditioning this point on market factors such as asset liquidity. These allow one to derive implications on the correlation between various components of the model. Specifically, two relationships between the Probability of Default (POD) and Loss given Default (LGD) of a debt instrument were found i.e. temporal correlations are positive and cross-sectional ones were negative. Such findings confirmed the intuition of existing reduced form approaches and provided the ability to inspect other properties of the relationship that derive from the theory.

Renu Arora and Archana Singh (2010) in his article highlighted that Reforming India's Financial Sector-Changing Dimensions and Emerging Issues at International center for Monetary and Banking Studies has described the background for financial sector reforms as under: "India embarked on a strategy of economic reforms in the wake of a balance of payments crisis in 1991; a central plank of these was reforms in the financial sector and, with banks being the mainstay of financial intermediation, the banking sector. At the

same time, reforms were also undertaken in various segments of financial markets to enable the banking sector to perform its intermediation role in an efficient manner. The thrust of these reforms was to promote a diversified, efficient and competitive financial system, with the ultimate objective of improving the allocate efficiency of resources through operational flexibility, improved financial viability and institutional strengthening.

The reform measures in the financial sector can be envisaged as having progressed along the following lines Siraj K K and P. Sudarsanan Pillai (2011), observed that large banks were sometimes thought to be more capable as they may have higher quality or more technically able people on their staff, they may be free from financial constraints.

A. Singh (2010), concluded that the issue of non-performing assets (NPA), the root cause of the recent global financial crisis, has been drawing the attention of the policy makers and academicians alike. The problem of NPAs, which was ignored till recently, has been given considerable attention after liberalization of the financial sector in India. This exploratory paper examines the trends of NPAs in India from various dimensions and explains how mere recognition of the problem and self-monitoring has been able to reduce it to a great extent. It also shows that public sector banks in India, which function to some extent with welfare motives, have as good a record in reducing NPAs as their counterparts in the private sector. The paper also discusses the role of joint liability groups (JLGs) or self-help groups (SHGs) in enhancing the loan recovery rate.

Pallab Sikadar and Munish Makkad (2010) in their paper examined and provide an insight into the concept of Non-Performing Asset (NPA), a standard criterion for assessing commercial bank credit risk globally. The paper attempts to put forward the means of interpreting credit risk from existing levels of bank NPAs. Further, research highlights the significant steps taken and procedures implemented by major Indian commercial banks, within the public and private sector, towards recovery of loans and advances slipping into the NPA bracket.

IIBF (2010) under the book Banker's hand book on Credit Risk Management studied the various aspects of CRM used by different Indian banks.

Nayan J and M. Kumarswamy (2010) presented the study touches up on the credit management practices in public sector banks and management of retail loans and advances. Trend analysis and percentage methods have been used to analyze data. The study found that the profit in PSBs was declining trend due to competition, lack of diversity of banking services and stringent rules of RBI before economic reforms. The profit was declining initial period due to operation was not linked with profit and lack of diversity in the banking services.

Impavido, G., Alberto R. Musalem and Thierry Tressel (2010), assessed the interest rate deregulation structure of India during the years 1981 to 2001, and concluded that interest rates deregulation allowed banks the freedom to determine deposit and lending rates. On the deposit side, the interest rate on saving deposits was administered (fixed at 4 percent) whereas, on the lending side, the sub-prime lending rate (PLR) had been permitted. The maximum spread was restricted to 4 per cent over the PLR of each bank, and there was a ceiling of PLR on small loans upto Rs 2 lakh (till the year 2002). Citing some of the weaknesses of interest rate deregulation, it was concluded that there did not appear any systematic mechanism for the interest rates structure. Also, when different authorities used different interest rates in the financial system, it could impinge upon the signaling attribute of the bank rate.

Meenakshi Rajeev and H.P. Mahesh (2010) in her article illustrated that credit risk management in today's deregulated market is a challenge. The very complexion of credit risk is likely to undergo a structural change in view of migration of Tier-I borrowers and, more particularly, the entry of new segments like retail lending in the credit portfolio. These developments are likely to contribute to the increased potential of credit risk and would range in their effects from inconvenience to disaster. To avoid being blindsided, banks must develop a competitive Early Warning System (EWS) which combines strategic planning, competitive intelligence and management action. EWS reveals how to

change strategy to meet new realities, avoid common practices like benchmarking and tell executives what they need to now – not what they want to hear. It concludes that the reputation of a bank is very important for corporate clients. A corporation seeks to develop relationship with a reputable banking entity with a proven track record of high-quality service and demonstrated history of safety and sound practices. Therefore, it is imperative to adopt the advanced Basel-II methodology for credit risk. The Basel Committee has acknowledged that the current uniform capital standards are not sensitive and suggested a Risk Based Capital approach. Reserve Bank of India's Risk Based Supervision reforms are a fore-runner to the Basel Capital Accord-II. For banks in India with the 'emerging markets' tag attached to them going down the Basel-II path could be an effective strategy to compete in very complex global banking environment. Indian banks need to prepare themselves to be competed among the world's largest banks. As our large banks consolidate their balance sheets size and peruse aspirations of large international presence, it is only expected that they adopt the international best practices in credit risk management Sharma (2005) examined the impact of NPA on the performance of public sector banks by looking at such variables as profitability, productivity, capital adequacy level, credit risk management and control. It also studied the effect of micro and macro-economic variables. And also, that study suggested the different preventive measures of reducing NPAS in bank b/sheet.

Dr krishna A Goyal (2010), emphasized that there should be diversification of risk. It can be measured by diversification ration on Excel workbook. If banks have diversified credit so lessen the risk exposure. Banks will better be able to manage credit risk. It gives risk managers to study the trend in transaction of Credit risk.

Arora (2010), discussed that the Indian banks are still preparing to solve the risk puzzle for a more transparent and risk-free financial base. This article looked at the risk measurement and management scenario in 2012, especially in retail lending which would be an area of concern in 2012 and suggest risk measurement tools to address the problem of low quality and high-risk loans. Further, the study concluded that quality of people, their level of knowledge and integrities and concern for the organization are the pillars

for success of any operational risk framework in any organization, especially when banks are in business of financial assets.

Srivastava, S. and Srivastava, D. (2010), using Analysis of Variance (ANOVA) Test, put forth that Interest Rate Risk, that is, the exposure of a bank's financial condition to adverse movements in interest rate, is the most prevalent risk. Interest rate risk arises from holding assets and liabilities with different principal and maturity dates or reprising dates. Banks could reduce their interest rate risk by hedging with derivatives securities and by using the Asset/Liability Management Techniques. Their analysis was confined to two Indian Banks, SBI and ICICI for the period 2006 to 2009, and it was found that in the case of SBI, a negative correlation existed between the volume of assets, loans, deposits, demand deposits, Return on Assets (ROA), Return on Equity (ROE), Interest margins, NPAs, and Tier I capital on one side and investment in Interest Rate Derivatives (IRD) on the other. On the other hand, the ICICI Bank showed a positive correlation amongst all the variables but for demand deposits and ROA in accordance with the Interest Rate Derivatives.

Mohane, Yatin and Shenoy, Akshay (2010), explained the overview of Basel II by highlighting the shortcomings of Basel I. After this the three pillars of Basel II along with its approaches were discussed in detail and in the end the benefits of Basel II were discussed in detail. The author believed that with the implementation of the new accord, banks will have a concrete set of guidelines available to impart direction to their risk management initiatives. Banks need to use this opportunity to implement effective risk management systems to achieve competitive efficiency. Accord provides an opportunity to enhance further the risk management. Forward-looking banks can thus provide leadership in the Indian sector and also ensure that they protect and advance the long-term interests of their shareholders while contributing to the financial stability of the financial system.

Shenoy Mohane and Singh (2010) this article aimed to build a deeper understanding of the emergence of Basel banking norms (Basel I), and the transition to each of the subsequent regulations (Basel II and Basel III). The primary purpose of developing this understanding is to further analyze the extent of effectiveness of the Basel norms. To explore how such regulations impact an economy specifically looked at five economies of the world (including India), which are geographically apart, in this context.

Renu Arora and Archana Singh (2010) their article evaluated the credit risk management (CRM) practices of Indian public sector banks in grant of commercial loans to find the grey areas which need review and restructuring to improve banks' asset quality. Based on literature review, a conceptual model of credit risk management systems for commercial loans, of Indian public sector banks, has been developed. This model has been used to underline the problems areas and obstacles in credit risk management through comparison of large and small banks. The empirical comparison of CRM practices of Indian public sector banks has resulted into emergence of various grey areas, like insufficient training, data management, inappropriate IT support, system disintegration, inconsistent rating approaches.

Rajan Singenellore (2010) demonstrated that publicly traded companies in India are generally better in terms of credit default risk compared to publicly traded companies in Hong Kong, South Korea and Singapore. In general, the median risk of publicly traded companies is slightly higher in those three countries than in India—potentially important information for investors as they narrow to a specific regional focus.

S.K. Bagchi (2010), article "Non-Performing Assets and Capital Account Convertibility" examines the Impact of nonperforming assets on the rise of fiscal deficit to reduce nonperforming assets for capital account convertibility.

Misra (2010), emphasized on the database of interbank variations in Non-Performing Assets in Indian banks. Indian commercial banking sector is characterized by both high average non- performing assets in total bank advance and a high dispersion between banks. It also focused that no sustainable improvement in the efficiency of domestic

banks is possible without prior improvement in the enforcement environment in the country. For resolution of credit risk LokAdalats were set up, Code of civil procedure was amended to expedite and simplify proceedings in civil courts, Abolish company courts and company law boards, Formation of ARC/SC under SRF AESI 2002. As a result of all these norms, the trend of credit risk in the form of Non-Performing Assets in nationalized banks, state bank group, total Public Sector Banks, private sector banks (old), private sector banks (new), foreign banks showed a declining trend from 1998 to 2001-2002.

Mohan Bhatia (2010), also focused risk based internal audit system used in Indian banks that helps in credit risk management in Indian banks.

Arindam Bandyopadhyay (2010), in his book observed that in the world of finance more specifically in Banking. Credit Risk is the most predominant risk in Banking and occupies roughly 90-95 per cent of risk segment. The remaining fraction is on account of Market Risk, Operations Risk etc. He feels that so much of concern on operational risk is misplaced. As per him, it may be just one to two per cent of Bank's risk. For this small fraction, instituting an elaborate mechanism may be unwarranted. A well laid out Risk Management System should give its best attention to Credit Risk and Market Risk. In instituting the Risk Management apparatus, Banks seem to be giving equal priority to these three Risks viz., Credit Risk, Operational Risk and Market Risk. This may prove counter-productive.

Arindam Bandyopadhyay (2010) in his book made an attempt to demystify various standard mathematical and statistical techniques that can be applied in measuring and managing portfolio credit risk in emerging market in India. It also provides deep insights into various nuances of credit risk management practices, which are derived from the best practices adopted globally.

Ho, T. S. and Saunders, A. (2010), used a number of indicators: Profitability Ratio, Net Interest Spread, Capital Adequacy Ratio, and the Net NPA Ratio for the period 1991 to 1997 for analyzing the performance of the Indian Public Sector and Private Sector Banks. The conclusion drawn was that the Private Sector Banks out- performed the Public Sector Banks. Despite having lower Net Interest Spreads, the Private Sector Banks had higher Return to Assets. Private Sector Banks thus demonstrated greater efficiency with profitability.

Eichengreen and Arteta (2010), using the GLS model, while studying the determinants of Net Interest Margins (NIMs), for 1998 to1995, for six selected European Countries and U.S.A, contended that the regulatory aspects in the form of reserve requirements, interest-rate restrictions on deposits, and capital-to-asset ratios have a significant impact on banks‟ NIMs. For the seven countries studied (UK, USA, Germany, Italy, Spain France and Switzerland), a 1% increase in the volatility, increased the bank‟s NIMs by 0.2%. This suggested that macro-policies consistent with reduced interest-rate volatility (e.g., low inflation policies) could have a positive effect in reducing NIMs. Also, it was highlighted that greater the monopoly power exerted by the banks, greater are the Net Interest Margins.

Das, A. and Ghosh, S. (2010), studied the financial characteristics of USA‟s Commercial Banks that use derivatives and analysed its impact on bank spreads. The empirical approach utilized the differences in means and regression (Tobit) analysis to investigate the relationship between the extent of derivatives usage by commercial banks and certain other financial characteristics as of year-end 1996. It was analysed that banks with low Net Interest Spreads attempt to increase fee income by speculating and selling derivative products, while banks with high Net Interest Spreads attempt to lock in their spreads by using derivatives to hedge. Larger banks which have smaller Net Interest Spreads use derivatives to increase fee income from Off-Balance Sheet (OBS) activities. Smaller banks use derivatives to protect their Net Interest Spreads.

Mohan, R. (2010) asserted that the price discovery of exchange rates and interest rates, and the integration of these prices across markets helped in the efficient allocation of resources in the real sectors of the economy. Uncollateralised overnight transactions were then limited to banks and primary dealers for the overall financial stability during 1990 to 2007 for India. The reduction in bid-ask spread in the overnight rates illuminated the fact that the Indian Money Market had become deep, liquid and vibrant. Financial Market Reforms in India ensured a greater and deeper integration of various segments of the Financial Markets, a reduction in arbitrage opportunities, and also achieved higher level of efficiency in the market operations of the intermediaries and banks. These factors also improved the efficacy of monetary policy of the economy. Growing integration of the financial markets, beginning 2000, could be ascertained from cross-correlation among various market interest rates. The increased integration among various financial market segments was accompanied by lower volatility in interest rates. To match the evolution of the foreign exchange markets and the increased depth and volumes in the markets, various hedging instruments viz. foreign exchange forwards, swaps and options were permitted to the market participants particularly against foreign currency exposures.

Kohli (2010), main aim of their paper was to present the set-up of a behavioural credit-scoring model and to estimate such a model using an auto loan data set of one of the largest multinational financial institutions based in France. The author relied on the logistic regression approach, which is commonly used in credit scoring to construct a behavioural scorecard and uses a number of quantitative criteria to identify the model best suited to modelling. Finally, it is demonstrated that such a model possesses the desirable characteristics of a scorecard.

Malhotra and Singh (2010), has authored an article on credit as well as credit risk management in banks. Credit portfolio is the real dynamic activity that requires close monitoring and constant management. The role of banks has changed from financial intermediately to risk inter mediatory. An integrated and proactive approach is required for managing the credit risk. It is very much essential to conduct credit investigation before taking up a proposal for consideration. The preliminary study should lead to

valuable information on borrower's integrity, honesty, reliability, credit worthiness, management competency, expertise, associate concern, guarantor etc. A due diligence report shall invariably accompany the credit proposal evaluation. Banks have to strictly adhere to the KYC (Know Your Customer) norms to ensure bona fide identification of borrows and should also follow the prescribed Fair Practice Code on lenders liability, by evolving their own best practices to be followed by the field functionaries, so as to avoid any complaints from customer at a later date. At present, due to lack of credit appraisal skill at the field level, manned by many generalist officials spread across the branch network, there is greater duplication of work at the sanctioning level at HO causing enormous and avoidable delay as papers pass through more than a dozen senior officials before they are placed before sanctioning authority. Author advised that banks should move from credit rating to credit risk rating and detailed discussion on cash flow generation should made compulsory part of project proposal. Credit decision will not get better by how many people review it, but who review it are knowledgeable and how much experience they carry with them in credit portfolio.

Barth, J., Gerrard Caprio and Ross Levine (2010) while assessing the performance of the Indian Public Sector Banks since bank deregulation set in motion in 1992-93, based on Ratio Analysis, concluded that the banking system neither collapsed nor was there a banking crisis after the Post-Reform Period. The Public Sector Banks due to the stringent regulatory framework stayed away from risky assets like real estate and stock market. Also, the harmful impact of full capital account convertibility as faced by a few developing countries‟ banks was skipped in the case of Public Sector Banks. Moreover, there had been a tendency towards Net Interest Spreads‟ convergence across all bank groups except foreign banks.

Leite, Sergio Pereira and V Sundararajan (2010) concluded in their study on "Issues in Interest Rate Management and Liberalization" about World-Wide Trends towards Financial Liberalization for the period 1970 to 1990 that lower interest rates would lead to more investment only if more savings were forthcoming. Extremely low interest rates will not just add to more investment. The aim was to keep real interest rates positive in

order to prevent non-productive hoarding of goods. Emphasizing interest rate differentials between countries, it was observed that interest rates should be set in consideration to interest rate differentials in comparison to world financial markets, taking into account the economy's degree of openness to capital movements. If two economies were totally open to capital movements, their interest rate differential would tend to be almost equal to the expected movements in the exchange rates between their currencies. In certain cases, where there was some but not perfect capital mobility, the interest rate differential, after allowance is made for exchange rate rate expectations, should not be too large so as to prevent destabilizing capital movements. The strategies for financial liberalization as adopted by various countries tantamount to: (a) The savings deposit rate was used as the minimum basic rate and a benchmark for all other rates. The government could then intervene in the financial markets by adjusting the savings deposit rate in line with the various monetary policy criterion, whilst also monitoring its effects on the interest rate structure; (b) Some governments have set a minimum deposit rate and a maximum lending rate, and over a certain period of time adjusted the floor and ceiling rates to bring about a gradual but subsequent liberalization of the system; (c) An alternative suggested was that in some countries interest rate range was set for the deposit rates and lending rates separately, and commercial banks were to set the aforesaid rates within these ranges. The authorities then could widen the range over time for effective liberalization of the rates and (d) Another alternative that was majorly dependent on market forces was that the government fixes the maximum spread between the average cost of funds to the financial institutions and their lending rates, and also allows them to determine the interest rate levels. If the spread as permissible by the authorities took into account risks, normal intermediation costs, and profits (but not monopolistic or oligopolistic profits), the result, would be an interest rate mechanism similar to the equilibrium rates as under competitive conditions. It was concluded that actual financial liberalization of interest rates was possible only through the above-mentioned strategies.

Maxwell Sandada, Agness Kanhukamwe (2010) in his book discussed various credit risk management techniques and their effects on banks credit policy. This book also focused on how banks can manage or improve their credit analysis methods to ensure that money which they are lending is not going to be classified as Nonperforming loans.

Bart Baesens, Daniel Rosch and Herald Scheule (2010), in their paper studied Islamic banking practices of risk management. The study examines the efficiency level of Islamic banks during the financial crisis specifically in Middle Eastern and Asian countries from 2007 to 2010. Moreover, bank-specific and risk factors were examined to understand the determinants of efficiency.

Subrahmanyam (2009), in their article aimed to explore the interactions between macroeconomic conditions, such as: real GDP growth rate, inflation rate, market interest rate, broad money supply, foreign exchange rate fluctuation and unemployment rate, and credit risk in Romanian banking sector during 2007-2012. The interrelations of indicators' complexity imply a multidimensional statistical analysis in order to find a relation between the macroeconomic conditions and the credit risk. The regression analysis findings confirm the hypothesis according to which the money supply growth rate and the market foreign exchange rate are negatively related with credit risk and the unemployment rate is positively related with it. Furthermore, their findings revealed that the credit risk is significantly and negatively affected by the exchange rate fluctuation and significantly and positively affected by the unemployment rate. The results do not indicate a significant relationship between credit risk and real GDP growth rate.

Kalita, Basanta (2009), studied the effect of introduction of Capital Adequacy Norms on the credit flow and asset structure of public sector banks. The study revealed that higher capital requirement has reduced the flow of credit to commercial sector, rapid changes and lowering of rate of interest has also reduced the interest spreads for the banks as a whole. The study further concluded that the bank strategy of investment has shifted in favor of government securities and these exceeded the Statutory Liquidity Requirements.

Karunakar, M., K. Vasuki and S. Saravanan (2009), divided his report into two parts. Part A described the evolutionary process culminating in the new accord. It outlined its salient features and explained the accompanying jargon so as to make it a single point primer for practicing bankers. Part B discussed its perceived impact with specific reference to the Indian banking Scenario taking into account the opinions of prominent Indian bankers and domestic software suppliers.

Bodla, B. S. and Richa Verma (2009), explained the basic approach to implement the Basel II by giving various features of Indian Financial system, briefly introducing the prudential norms, RBI's involvement in Basel II, regulatory initiatives and the various challenges envisaged. Indian Financial system mainly comprised of public sector banks, private banks, regional rural banks and foreign banks. The author discussed that as RBI announced that all the banks in India will adopt Standardized Approach (SA) for credit risk and Basic Indicator Approach (BIA) for operational risk. After adequate skills will be developed, then both in banks and at supervisory levels, some banks may be allowed to mitigate to Internal Rating Based (IRB) approach. There is, therefore, ample of the evidence of the capacity of Indian Banking System to migrate smoothly to Basel II.

Rajagopal (2009), in their book Financial Risk Management focused on models and applications in the area of Market, Credit Risk and ALM. Both authors have also studied the firm wide risk aggregation and firm wide scenario analysis and stress testing. It provides a holistic view of the modern integrated yet modularized risk management practice.

Kaminsky and Reinhart (2009) studied the macro economic factors and variables that act as early warning signals for recessionary conditions. Analysing major global banking crises in the period 1970 to 1995, it was found that the macro economic variables detrimental to the growth of a sound banking system pertained to a decline in economic activity, falling stock markets, weakening of the export sector and extremely high real interest rates in the banking system. These factors usually precede both, banking, as well as currency crises. Besides these, credit expansion, abnormally high money growth rates

and a decline in terms of trade are also some of the other factors that precede banking crises. Moreover, very high and positive real interest rates were also cited as a macroeconomic variable preceding a financial crisis.

Siraj. K. K and P. Sudarshanan Pillai (2009) emphasized that NPA is a virus affecting banking sector. It affects liquidity and profitability, in addition posing threat on quality of asset and survival of banks. The study concluded that NPA still remains a major threat and the incremental component explained through additions to NPA poses a great question mark on efficiency of credit risk management of banks in India.

Mohan, Rakesh (2009), assessed that Indian Public Sector Banks during 1991to 2001 faced reduced profitability due to their nature of ownership and also due to their goals and priorities as was also authenticated using various profitability ratios. It was further contended that the PSBs are sometimes faced by compressed profitability due to the high burden of NPAs. Moral suasion and more direct methods are imperative to reduce their lending spreads, which further threaten to compound the difficulties of the PSBs. Upon linking the profitability aspect of PSBs and their bank spreads, it was concluded that if banks enjoyed higher Net Interest Spreads, and if all other things remained constant, then they would be able to withstand the risk associated with higher NPA generation. By squeezing the Net Interest Spreads of banks, their ability to per-se absorb the risk associated with lending to sub-prime categories was threatened.

Bhide, M, A. Prasad and Saibal Ghosh (2009) using Data Envelopment Analysis of Risk and Productivity changes of Indian Public Sector Banks, contended that insufficiently capitalised banks have lower productivity and were subject to a higher degree of regulatory pressure than adequately capitalised banks for the period 1995 to 2001. It was observed that productivity changes and capital risk are to a great extent intertwined, and to a degree, reinforcing and complementing each other.

Cohen (2009), in his research study said that it is an empirical application of credit scoring and rating techniques to a corporate historical database of one of the major Portuguese banks. Apart from a discussion on several alternative scoring methodologies the author has developed two distinct strategies for grouping the individual scores into rating classes. Finally, the regulatory capital requirements under the New Basel Capital Accord are calculated for a simulated portfolio, and compared to the capital requirements under the current capital accord. Although the credit portfolios of commercial banks mostly consist of privately held firms, literature on corporate credit risk modeling for such borrowers is scarce. Unavailability of public data has impeded the path of research in the area. This paper contributed to the literature on credit risk modeling for privately held corporate firms.

Zuzana Fungacova and Laura Solanko in Their Article (2009), proposed to investigate the current practices of Credit Risk Management by the largest US-based financial institutions. Owing to the increasing variety in the types of counterparties and the ever-expanding variety in the forms of obligations, Credit Risk Management has jumped to the forefront of risk management activities carried out by firms in the financial services industry. This study was designed to shed light on the current practices of these firms. A short questionnaire, containing seven questions, was mailed to each of the top 100 banking firms headquartered in the USA. It was found that identifying counterparty default risk is the single most-important purpose served by the credit risk models utilized. Close to half of the responding institutions utilize models that are also capable of dealing with counterparty migration risk. Surprisingly, only a minority of banks currently utilize either a proprietary or a vendor-marketed model for the management of their credit risk. Interestingly, those that utilize their own in-house model also utilize a vendor-marketed model. Not surprisingly, such models are more widely used for the management of non-traded credit loan portfolios than they are for the management of traded bonds.

Altman and Saunders (2009), discussed that bad management hypothesis predicts that external events increase non-performing loans for banks. This leads to greater operating costs for the bank to deal with these problem loans, which hampers banking efficiency. Second, Bad management hypothesis considers low efficiency as a signal of poor managerial performance, which also affects loan granting behavior. Indeed, poor managers do not adequately monitor loan portfolio management, owing to poor skills in evaluation of loans or to inadequate allocation of resources to loan monitoring. This results in greater volume of nonperforming loans.

Gabriel Jimenez and Jesus Saurina (2009), reviewed, appraised, and criticized theoretical and empirical research on the connections between the operation of the financial system and economic growth. It also discussed that financial system may provide different services at different stages of economic development, so that the financial system needs to evolve if growth is to continue.

Treacy and Carey (2009), in their article discussed developments in the credit risk measurement literature over the last 20 years into two parts. In the first part, the evolution of the literature on the credit risk measurement of individual loans and portfolios of loans were traced. And in the second part, a new approach around a mortality risk framework to measure the risk and returns on loans and bonds was presented. This model was shown to analyze the risk-return portfolios of credit-risk exposed debt instruments.

Wang Lang (2009) highlighted that prominent type of risks are Liquidity risk, Interest rate risk, foreign exchange risk, Operation risk and Credit risk and Credit derivatives are of immense help in reducing default risk.

Fernandes (2009) investigated whether the new Basel Accord will induce a change in bank lending on German banks foreign exposure. They tested two interlinked hypotheses on the conditions under which the change in the regulatory capital would leave lending flows unaffected. This would be the case if (i) the new regulatory capital requirement remains below the economic capital and (ii) banks' economic capital to emerging markets

already adequately reflects risk. On both accounts the evidence indicated that the new Basel Accord will have a limited effect on lending to emerging markets.

Fatemi and Fooladi (2009), in their article discussed that the magnitude of Credit risk depends upon prudential regulation, concentration, and credit cycle. The downturn in business cycle in an economy was the primary cause of the banking industry's recent travails.

Njanike (2009), in his article on tested the Accuracy of Basel II, emphasized that Basel II rules allow qualified banks to assess the risk in their portfolio of credit exposures with a methodology based on the informational content of credit ratings. Two crucial assumptions were taken: (1) the credit risk of individual exposures was driven by one systematic risk factor only and (2) the portfolio was fully diversified. The accuracy of the credit risk measures was obtained with the new rules by comparing them with benchmark measures derived with a popular ratings-based credit risk model which accounts for multiple risk factors and portfolio concentration was tested. Further it was found that the Basel II assumptions may have a substantial impact on risk assessments and produce deviations from the benchmark that may be economically significant.

Mohan, R. (2009), in a colloquium of distinguished panel of managing directors and chief executive officers of well-known banks, recognized the numerous challenges faced by the Indian Banks in the Post-Reform Period (1991 to 2003), by way of increased competition, pressure on Net Interest Spreads and systematic changes of alignment of banks in accordance with international standards. These necessitated a re-evaluation of strategies and processes in order to remain competitive in the future‟s dynamic environment. They also recognized that banks would be henceforth under pressure to diversify their income streams further for future. Also, it was cited that the importance of bank lending could be expected to decline as capital markets competed with the banking system more closely. This effect was termed as “disintermediation”.

Kannan, R., Narain, A. and Ghosh, S. (2009) summarized Net Interest Spread as the difference between interest earned and interest expended by a bank divided by its total assets and is considered an indicator of bank performance and efficiency. An empirical approach was followed whereby results were obtained for the determinants of Net Interest Spreads of the Indian Commercial Banks during the period 1997 to 2001 using Panel Data Model. A competitive banking system catered to greater efficiency through a lower Bank Interest Spread. Due to the banking sector reforms in 1991, Interest Spreads in the Indian Banking Sector did come down, but the decline was slow. A comparative analysis of Bank Spreads of the developing and developed countries revealed that NIM in the developing countries was higher than in the developed countries. The reasons were lack of sufficient competition, higher intermediation costs, and lagged responses to changing regulations. It was concluded that :(a) Proportion of investment in government securities adversely affected Net Interest Spreads. If less investment was done in government securities, then banks could have invested in other options which give higher returns and generate more interest income; (b) Proportion of advances to the Priority Sector positively affected NIM. Due to the removal of interest rate subsidy on priority sector loans, it was considered 28 a viable business option for banks to lend to the Priority Sector and to park the shortfall in the Rural Infrastructure Development Fund (RIDF) of National Bank of Agricultural and Rural Development (NABARD) to meet priority sector lending targets; (c) Higher Capital Adequacy Ratio was associated with higher Net Interest Spreads. This was because banks with higher Capital to Risk Weighted Assets Ratio (CRAR) seek more interest income in order to maintain high levels of capital which get reflected in higher Net Interest Spreads; (d) Higher Non-Performing Assets (NPAs) were associated with lower Net Interest Spreads. Banks with high Non-Performing Assets shifted their loan portfolio away from risky activities to prevent negative effect on their bank spreads;(e) Nature of Ownership was also a significant determinant of Net Interest Spreads;(f) Foreign banks had the highest Net Interest Spreads, followed by Public, Old Private, and New Private Banks, and (g) the proportion of non-interest income to total assets signifies fee-based activities of banks.

Higher Income from fee-based activities allowed the banks to tolerate lower levels of Net Interest Spreads.

Maudos, J. and Solís, L. (2009), contended that off-balance sheet activities (OBS) of Scheduled Commercial Banks comprised of four categories; (a) swap and hedging transactions; (b) bank guarantees; (c) loan commitments, and (d) investment banking activities. These OBS activities generate fee for banks but also increase bank risk. The banks use them as a means of augmenting earnings to offset reduced spreads on traditional On- Balance Sheet corporate lending business. An empirical analysis of the Off-Balance Sheet Activity of the Indian Banks for the period 1996-2004 was conducted to identify the determinants of the off-balance sheet activities of the banks, using the Logistic Diffusion Model.

Ketkar, S. and Ketkar, W. (2009), using the Fixed and Random Effects Multiple Regression Model (Panel Data), contended that since 1997, Net Interest Margins had declined in every segment of the Indian banking system. The Nationalized Banks and their profit margins, with and without taxes, had improved, but the private banks‟ Net Interest Margins and profits started improving since 2005 and outstripped the overall industry margins. It was concluded that the industry-wide net profit margins peaked in 2004, and had not recovered from their downward spiral since then. However, the banks had gained in efficiency in terms of producing the specified outputs, and also on an individual basis, the banks performed better in the Post- Reform Period (1991 onwards).

Maudos and Solis (2009), using both Static and Dynamic Panel Data Model for the period 1993 to 2005 in Mexico, observed that if banks had higher Operating Costs but also adequate Market Power then they passed that on to the customers in the form of higher Net Interest Margins, and thus enjoyed higher Intermediation Margin. The banks even protected themselves from a high volatility of market interest rates by charging higher Net Interest Margins. In addition, it was observed that banks that are managerially inefficient selected less profitable assets and high-cost liabilities, leading to lower

margins. Also, banks with high levels of implicit interest payment tend to set a higher margin because it represented an additional expense.

Altunbas, Gambacorta, and Ibanez (2009), using the Panel Regression Model for the period 1999 to 2005, contended that the dramatic increase in securitisation activity experienced in Europe in the years following the introduction of the euro had altered the liquidity, credit, and maturity transformation role traditionally performed by banks. They claimed that the changing role of credit intermediaries due to securitisation had also modified the effectiveness of the bank lending channel and banks‟ ability to grant loans in a constructive way. The use of securitisation shelters banks‟ loan supply from the effects of monetary policy. Securitisation activity had also strengthened banks‟ capacity to supply new loans. The capacity to supply new loans also depended on business cycle conditions and, also on banks‟ risk positions. The study validated the importance of securitization as a risk hedging tool in the European Banks

Thorsten, Kunt, and Levine (2009) studied the recent trends in the structure and development of financial institutions and markets across countries based on their bifurcation into high-income, middle-income and low-income countries from 1995 to 2007. Lending and debt issues were more concentrated in the high-income countries, while the low and lower-middle income countries experienced an increase in remittance flows. Lower Net Interest Margins, rising profitability through off-balance sheet activities, and declining stability in the high-income countries‟ banking sectors led to the financial sector boom in the high-income countries, and finally culminating into the Global Financial Crisis of 2007. Moreover, while analyzing the profitability 32 of banks, different patterns of different income groups across countries were observed. Poorer countries have high Net Interest Margins and overhead costs.Net Interest Margins exhibited a decreasing trend between 1995 to 2007 in the median income countries. While Net Interest Margins have been low and relatively stable in the high-income countries in the same period, there has been a significant declining trend in the Net Interest Margins in the upper-middle income countries. Net Interest Margins in the median-low and lower-middle income countries, categorized on the basis of the level of

income, witnessed a decreasing trend between 1995 to 2007. Overhead Costs displayed a decreasing trend across all income groups.

Subramanian, V. (2009) highlighted the scope and objectives of Risk Management System in the Indian Banks from 1990 to 2005, and further emphasized the steps involved in transforming risk management from the traditional control-oriented process into a value-adding function. Various risks were identified and categorized as Credit Risk, Liquidity Risk, Interest Risk and Operational Risk, and a Risk Matrix Approach was followed whereby the mentioned categories of Risks were identified in the various Banking Sector Products. Also, steps of Risk Management were identified and categorized as (a) Risk Identification; (b) Risk Measurement; (c) Risk Control and Monitoring; (d) Capital Allocation, and (e) Risk Adjusted Performance Measurement and Value Management. It was also stressed that the significance of Integrated Risk Management was critical for effective value addition and also the role of capital as a cushion for risk taking was pronounced as pivotal by the Basel Capital Accord II (2004-05). In the Basel Accord II (2004-05), sweeping changes have been suggested for the computation of Capital Adequacy as Basel Accord I (1988) failed to achieve its objective of promoting safety and soundness of the financial system.

DM Nachane and Saibal Ghosh (2009) using data for 1996 to 2004 and applying Logistic Diffusion Model analyzed that the Indian Banks had increasingly made forays into newer domains of operation in order to augment their fee income and as a consequence, the Off-Balance Sheet (OBS) business then had gained prominence. The article elaborates the determinants of Off-Balance Sheet activities in the Indian Banking Sector. It was observed that besides the regulatory factors, the macroeconomic conditions and market forces captured by banks‟ specific characteristics also contributed in the diffusion pattern of Off-Balance Sheet (OBS) activities. From the regulatory consideration, while Capital Adequacy was a dominant concern in the case of Public Sector Banks, Non-Performing Assets seemed to be a prime concern for Foreign Banks, in addition to Private Sector Banks. Among other factors, at the bank specific level, „size‟ was an important consideration for the Public Sector and Foreign Banks, while

profits were a prime concern mainly for the New Private Sector Banks. Finally, the macro-economic environment seemed to have played an important role in affecting OBS diffusion, more specifically for Public Sector and New Private Sector Banks.

Charumathi, B. (2009), using Ratio Analysis, emphasized that the „size" of the banks did not matter in the case of interest rates swaps in the banking operation after analysis of 24 Indian Commercial Banks" annual data for the year 2007-08. This study led to the conclusion that the larger banks (as explained by the total assets) and profitable banks (as explained by the profit before tax to total asset ratio) did not seem to have any comparative advantage in using interest rate swaps for hedging purposes. But banks with more exposure to interest rate risk, and high net worth, and higher loans to asset ratio, tend to be the larger users of interest rate swaps. In view of the rapid growth of interest rate swap market in India and narrowing of bid-offer spreads, the participation of banks in the swap market was going to be more substantial in the future.

Agarwal, R. and Arora, D. (2009) asserted that according to the RBI Guidelines on Risk Management in Banks (1999), the broad parameters of the Risk Management Function should encompass: (a) Organisational Structure of the financial institution; (b) its comprehensive Risk Measurement Approach; (c) Risk Management Policies should be approved by the Board and should be consistent with the capital strength, broader business strategies, management expertise, and overall willingness to assume risk; (d) Guidelines and other parameters used to govern risk- taking to include a detailed structure of prudential limits; (e) strong MIS (Management Information System) in place for reporting, monitoring and controlling risks; (f) well-laid out procedures for effective control through comprehensive risk reporting mechanisms; (g) separate Risk Management Framework, independent of operational departments and a clear segregation of levels of responsibility for the management of risk; and (h) its periodical review and evaluation.

Sensarma, R. and Jayadev (2009) examined interest rates risks as the risk of a decline in net interest income of a bank due to a change in interest rates. The paper interprets selected accounting ratios as risk management variables and attempts to gauge the overall risk management capability of banks by summarizing the accounting ratios as scores through the application of multivariate statistical techniques and studies the impact of these risk management scores on stock returns through regression analysis of Indian Commercial Banks for the period 1999 to 2006. It was concluded that the movements in interest rates affect the Bank Spreads and the Return on Assets (ROA), and finally shareholders‟ returns. Categorizing banks as Asset-Sensitive Banks and Liability-Sensitive Banks, it was concluded that the Net Interest Spreads of Asset- Sensitive Banks were impacted by falling interest rates, and those of the Liability- Sensitive Banks were impacted by rising interest rates. In order to manage interest rate risk, Indian banks have installed Asset-Liability Management Systems, adopted Duration Gap Analysis, and introduced risk control measures based on value at risk techniques, a measure of the risk of loss on a specific portfolio of financial assets. Net Interest Spreads reflect the resilience of banks to interest rates risks. The ratio of net interest income to total assets is an indicator of interest rate risk management capabilities of banks.

Angbazo, L. (2008) using Generalised Least Squares (GLS) studied the link between Net Interest Margins, Interest Rate Risk and Default Risk of different classes of banks for the time period 1989 to 1993 in U.S.A. It was observed that money- centered banks were not sensitive to interest rate risks but to default risk due to higher exposure to off-balance sheet activities. The super-regional banks were more sensitive to interest rate risks due to less exposure to off- balance sheet activities of banks, but less prone to default risk. The local banks were exposed to both default risk and interest rate risk. Thus banks, by their categorization, were more or less exposed to Interest Rate Risk and Default Risk.

Demirguc-Kunt, Asli and Huizinga, Harry (2008), pointed out the differences in the impact of foreign ownership between developed and developing countries using a cross-country study of variations in Bank Performance using Regression Analysis. The data set was at bank level for 80 countries over the period 1988 to 1995. In the developing

countries, foreign banks have greater Net Interest Margins and profits than the domestic banks. In the developed countries‟, the opposite case holds true. The first finding points out to the lower Non-Performing Assets‟ (NPAs) of foreign banks by their country of origin in India. The foreign banks because of their higher per capita GDP have much better banking opportunities and operating environment than domestic banks.

Ajit, D. and R. D. Bangar (2008), study of the Non-Performing Assets of the Spanish Banks during the period 1985 to 1997, based on Panel Data concluded that the Non-Performing Assets of banks differed by type of loan. Firms and Households both contribute to Non-Performing Assets. But on an average, the households‟ NPA‟s or bad loans were lower than those of the firms‟. Among households, mortgages had lower delinquency levels compared to credit loans, consumer loans, or overdrafts. The various categories depicted that an adverse selection of the aforesaid categories had a persistent worsening effect on the banks which were comparatively new entrants in the market. An adverse selection further impacted much banks‟ profitability.

Gary Chen (2008) discussed the overview of credit risk measurement under BIS II framework using block diagram in their paper Experiences in the Implementation of Credit Risk Management for Basel II. Authors also reviewed internal rating system tasks, role of different entities in Credit Risk Management (CRM) of banks with block diagram. Authors also designed requirements for rating systems, IRB requirements for credit ratings, overview of model development process and validation of the model. Paper also discusses the data collection and maintenance of systems.

Michael Gilroy Dresden and Paderborn (2008) According to their book, the credit risk is one of the most important forms of risk faced by national and international banks as financial intermediaries. Managing this kind of risk through selecting and monitoring corporate and sovereign borrowers and through creating a diversified loan portfolio has always been one of the main challenges in bank management.

David Shimko (2008) focused on counterparty initiation and monitoring, contracting standards, credit authorities and limits, transaction approval process, credit risk reporting and reserving and capital policy. Improved risk measurement and reporting techniques paired with comprehensive credit risk policies can provide extremely effective protection against credit risk losses. The best risk management techniques are operational and legal, with collateral providing the best financial risk mitigation. Credit insurance and credit default swaps offer financial protection against default, but each at its own cost-which must be compared to the benefits of reducing the specific risk it is intended to mitigate. Sberbank consolidated Financial Statements and Independent Auditors' Report 2009 helped in understanding the credit risk management procedure in Russian banking sector. It also helps in providing conceptual understanding along with various process and procedures involved in credit risk management including assessment, evaluation, securitization, monitoring, exposure limits, credit risk concentration, minimizing the credit risk in Russian banks.

CHAPTER - 3

RISK MANAGEMENT IN BANKS AN INDIAN PERSPECTIVE

It is said that banking is a risky business and bankers are known to take risks. The basic business concept is embedded in the concept of 'No Risk- No Profit'. However, the statement – Higher the Risk, Higher the Profit – may not prove good all the time. Since risk taking is a part of the banker's business, it will be cautious to identify and understand the risks that exist in every transaction. Any practicing banker will know, the risks, when translated into reality will straightaway hit the profit and loss account on the debit side.

Risk is always associated with the banking activities, and taking risk is the important part of any banking operations, there is hardly any banking operation without the risk. Most of the bankers are said to be sound when they have a clear overview of what is the amount of risk involved in the current transaction and they make sure that some of the partly earnings are therefore kept for these risks. The granting of any form of credit is the common form for any bank and this risk is very common and this is the source of risks the banks are always exposed to. (Anderson et al, 2001). Any risk cannot be mitigated or managed without its identification and measurement. Risk measurement is a complicated job that required modern technological tools coupled with razor-sharp minds. Credit risk is always been a primary concern for any financial institution but not has always been effectively managed. The Financial crisis that started in 2007 exposed the weakness of existing credit risk management in banking sector. There were shortcomings in the way many different firms of all sizes and regions were managing their credit risk. This was especially highlighted by complex and innovative products like mortgage-backed securities and collateralized debt obligations. Many firms had considerable exposure to these products without understanding the inherent risk. This resulted in huge losses as the prices of their investments fell. It also had a ripple effect as some of their counterparties, including large firms like Lehman Brothers, filed for bankruptcy or came close to doing

so. The global financial crisis – and the credit crunch that followed – put credit risk management into the regulatory spotlight. As a result, regulators began to demand more transparency. They wanted to know that a bank has thorough knowledge of customers and their associated credit risk.

Some financial institutions have collapsed or experienced financial problems due to inefficient credit risk management systems typified by high levels of insider loans, speculative lending, and high concentration of credit in certain sectors among other issues. Credit risk management practices and poor credit quality continue to be a dominant cause of bank failures and banking crises worldwide. Again, Financial Institutions have faced difficulties over the years for a multitude of reasons, the major cause of serious banking problems continues to be directly related to lax credit standards for borrowers and counterparties, poor portfolio risk management, or lack of attention to changes in economic or other circumstances that can lead to a deterioration in the credit standing of a bank's counterparties (Gil Diaz, 1994). The global economic depression that knocked almost all big economies throughout the world down in the past few years is still kept in many people's minds. It was triggered by the United States financial sector. One key reason for the collapse or nearly-collapse of the financial institutions is the badly-functioned subprime mortgage lending to companies/people with bad and unreliable credit. When the prices of houses used as securities for the loans slumped, those loans became non-performing loans or bad debts. (OECD 2008 and the Renegade Economist 2009) As soon as the world begins to see the signs of a recovery period, the financial sector, this time in the Euro-zone, suffers another great distress at the serious debt crisis in Greece that poses risk to the European Central Bank (ECB) and many other institutions in the industry. A number of European banks have made investments in Greek government bonds and other securities and use them as collaterals to obtain loans from ECB. And now when Greece defaults, the collateral subsequently loses its value and the ECB"s balance sheet is put at risk as it fails to recollect the loans. Greek banks are not the only ones in danger. French and German banking business are on the same boat with respectively $80 billion and $45 billion exposure to the troubled country. Recently, the

Basel Committee on Bank Supervision demands a jump in both tier 1 and tier 2 capital levels as a response to the crises these days. (Wall Street Journal 2010). Many Banks were collapsed in late 1990 in Kenya were as a result of poor Credit risk management which was portrayed in high level of Nonperforming assets. This is dangerous when credit growth is central to any banking organizations profit (Infotv, 2010).

"Such type of incidents lifts a question for all financial institutions in general and banks in particular: What could they have done in order to prevent or at least lessen the bad impact of this happening?"

It urges the significance of a sound credit risk management in lending organizations. Credit risk is a popular type of risk that both non-financial and financial institutions must deal with. Credit risk occurs when a debtor/borrower fails to fulfill his obligations to pay back the loans to the principal/lender. In banking business, it happens when payments can either be delayed or not made at all, which can cause cash flow problems and affect a bank's liquidity (Greuning & Bratanovic 2009, 161). Hence, credit risk management in a bank basically involves its practices to "manage", or in other words, to minimize the risk exposure and occurrence. For a commercial bank, lending activities form a critical part of its products and services and more than 70% of a bank's balance sheet generally relates to this aspect of risk management". Therefore, credit risk management is crucial to any banks success (Greuning & Bratanovic, 2009) In a developing country like India, the financial sector is still in the development phase and many small commercial and Co-operative banks have not been able to establish a solid credit risk management framework, in order to prevent unfavorable events. Weakness in the Indian banking System became apparent in the late 1980's. Differences in governing banking, lack of self-sufficiency, weak supervisory competence to carry out the Central bank's surveillance role and enforce banking regulations and sometimes improper government policies which contributed to growth of Non-Performing Assets among others posed a challenge to Indian Banking system. Liberalization of the Indian banking Industry in 1990's marked the beginning of severe competition among the commercial banks, which made banks expand massive amounts of credit to increasing profitability. Some of the

loans were political loans granted with little or no credit assessment; other loans were made to insiders, all of which subsequently became non-performing. The low quality loans led to high levels of non-performing loans and subsequently wrinkled profits of banks. This is where concern about this research topic began. The research was an attempt to assess the extent to which the implementation of various Credit Risk Management Strategies by the bank has reduced the amount of nonperforming assets. Instead of analyzing foreign-owned banks that have quite comprehensive credit risk management framework, the researcher is far more worried about the practices in Indian Banks which are always under competitive and profit pressure in a revenue oriented banking market. Sales and profit targets make them at times ignore what should be carefully done and this poses an extreme risk to the banks overall performance. The point is they are not strong yet in this area despite the fact that Indian Banks are actively joining hands with the central bank i.e. RBI to improve their management of major risks.

Bad Loans or we can say Bad assets (BAs) in India have almost doubled from 5.7% in FY08 to 10.2% in FY12, (as per RBI Reports, 2008 to 2012) which has impacted the banking industry adversely. In the last couple of years, as NPA levels have grown considerably in the Indian economy, a significant proportion is skewed towards corporate. Consequently, credit risk assessment, credit administration and monitoring have come increasingly into focus. The suitability of current credit risk assessment has often come into question. Lending has brought trouble to individual banks and entire Indian Banking system. It is, therefore, imperative that the Indian banks should have adequate systems for credit assessment of individual projects and evaluating risk associated therewith as well as the industry as a whole. Generally, Banks in India evaluate a proposal through the traditional tools of project financing, computing maximum permissible limits, assessing management capabilities and prescribing a ceiling for an industry exposure. As banks move in to a new high-powered world of financial operations and trading, with new risks, the need is felt for more sophisticated and versatile instruments for credit risk assessment, monitoring and controlling. Therefore, it is time that Indian bank management prepares them fully to fight with the demands of

creating tools and systems capable of assessing, monitoring, control and manages credit risk (Rekha Arun Kumar 2005). In view of above, the importance attached to the research subject, researcher has felt great need for comprehensive study on credit risk management in Indian Banks. The need of doing this research occurred because currently in India, there are very less research has been done which covers fully or partially knowledge on credit risk management. Most of the earlier research work was too academic or needs to be familiar with real world situations or not good enough to give complete understanding for future readers. The research has been done keeping in mind the objectives of thesis to ascertain to what extent banks can manage their credit risks, what tools or models are at their disposal, How NPAs and Credit risk are related and how it can be controlled and to what extent Securitization has effected bank's NPAs and how banks performance can be augmented by proper credit risk management policies and strategies.

In particular, RBI guidelines and principles have been taken into consideration by researcher. Data from RBI and IBA have been thoroughly complied. This research also comprised primary data which was collected through survey where questions on credit risk management that were asked to respondents touches the ground reality in Indian Banking Sector so the readers get a broad view of the credit risk management practices in Indian banks. After a thorough research into a number of Indian banks, this research points out several facts of banks Credit Risk Management framework.

i. Limited experience in Modern Banking Techniques, products and credit risk management models

ii. Lack of accurate, reliable and complete data for decision making

iii. Poorly developed reporting and bank supervision guidelines to deliver timely and useful information on the performance of Indian Banks

iv. Non-transparent legal and regulatory environment, e.g. legal security over assets, recovery of bad debts, and profitable banking activities

v. Challenging economic and natural environment (unstable conditions, disasters, etc.

vi. Inefficient data management. An inability to access the right data when it's needed causes problematic delays.

vii. No group wide credit risk modeling framework. Without it, banks can't generate complex, meaningful risk measures and get a big picture of group wide risk.

viii. Constant rework. Credit Analysts can't change model parameters easily, which results in too much duplication of effort and negatively affects a bank's efficiency ratio.

ix. Insufficient Credit risk tools. Without a robust credit risk solution, banks can't identify portfolio concentrations or re-grade portfolios often enough to effectively manage risk.

x. Cumbersome reporting. Manual, spreadsheet-based reporting processes overburden analysts and IT.

Risk Management Practices in Banks

The emergence of risk management as an organized effort is only a recent phenomenon that happened especially after the opening up of the banking sector to the private and outside players in the wake of banking sector reforms. Why has that been so? Why even the elementary risk management practices had not been integrated in the functioning of banks earlier? A little introspection may provide the answer to this very simple but vital question. The first reason had been excessive state intervention in the functioning of banks and the neglect of risk management strategy and its application. There had been directed lending, administered interested rates, targeted oriented performance emphasizing expansion and extension, meeting of credit targets irrespective of the attendant risks. The bank managements felt that their performances are to be evaluated on the basis of their achieving the target set for and that they can sacrifice the profitability and associated risk in meeting their targets.

The second reason had been the banking policy in vogue in that regime. The banking policy was primarily influenced by the economic planning strategy formulated under different five-year plans where in banks were projected mainly as the provider of capital to various tasks and projects envisaged in the plans by suitable resource mobilization. Further, banks were required to disburse soft and easy loans and financial assistance to poor and less developed sections of the society to augment their income generation capability without proper and adequate security under several governments –sponsored schemes. In fact, the social banking had become the overriding goal. Another contributory factor was the accounting system. Under the accrual system of accounting and the disclosure norms, even bad loans were being carried forward as good loans for years together while non-recoverable interest incomes were shown as income without their proper provisioning. All these policies and practices helped the banks project their financial positions in a glorified way hiding the actual state of affairs. Lastly, it may not be out of place to question even the role of Reserve Bank of India (RBI) at that point of time.

The New Challenge

Past is past. The current Indian banking scenario is healthy and resurgent, thanks to the financial sector reforms. A series of policy initiatives and measures have enabled banks to be in a position to function with highest operational freedom, accountability and transparency, leading to greater customer- satisfaction. Entry of private and foreign players in Indian banking space, end of the detailed control on lending and deposit including fixation of their price and reduction of CRR and SLR to make more fund available to the bankers for their business, have all contributed to the present robustness of banking sector in India. Introduction of new mechanisms like debt recovery tribunal ,one-time settlement scheme and enactment of new acts like securitization Act have tightened legal arrangements for recovery of NPA's .Further ,new accounting and prudential norms relating to income recognition ,provisioning and capital adequacy have been introduced as part of a comprehensive drive to improve upon the financial health of the banks and to regain the investor confidence. And to cap it all, even the public sector

banks have been allowed access to the capital markets to raise their capital and many such banks have already raised huge funds to strengthen their capital base through this route.

Thus, given the current scenario, the banks can no longer say that they do not have the freedom to operate their business as they like. It is the time they meet the twin objectives of profitability and safety of their assets. Banks will have to take charge of the major area of risk management for their own survival and growth. To cope up with these changes in the external environment and to meet the internal requirement banks have to develop skills for managing newer types of risk, market risks, interest rate risks, foreign exchange risk, liquidity risks, in addition to traditional credit risks. The situation has further been aggravated in the context of present fluidity of international capital markets and the increased vulnerability of developing economies to sharp fluctuations in macro-economic situations. Generally, the bank failures in many countries have largely been due to non-existence of proper risk management system or due to its improper functioning.

Another vital trend is that owing to decrease in the spread (difference between interest incomes and interest expenses) arising out of stiff competition, banks have no other alternative but to enter into other risky areas of business and thereby increase the quantum and variety of risks involved. Today's banking rest mainly on maintaining and optimum balance among risks, profitability and growth. There is no other option in this game. Accordingly, banks need to put in place comprehensive frame work for risk management duly matched with its variance of business profile and database in their command. Gradually, with the contemporary changes, the whole process will have to be consolidated further to meet the test of time. The awareness of healthy banking that had seeped into all levels of banking establishment replacing a sense of complacency prior to 1990, may be regarded as the single most vital contribution of the financial sector reforms.

To summarize, four factors are therefore principally responsible for the current "healthy" state of the banking system. Three of these produced incremental profits and capital that was used toward very high levels of incremental provisioning.

- The implied government guarantees that the public never lost confidence in the banks. For instance, despite the fact that Indian Bank's net worth turned negative in 1995-96, the bank has continued to maintain an average growth in deposits of more than 10 percent (1995 -96 to 2003-04)
- The large and persistent difference between the cost of demand deposits (current and savings) and the rate of return on the government of India securities (risk-free rate) helped banks to post some profit.
- The secular fall in the interest rates on government of India secures, the very long-duration issuance and purchase by public sector banks and very high level of duration mismatch between assets and liabilities of banks allowed banks to book profits in their trading books at will by simply selling the older bonds and buying newly issued ones.
- High levels of explicit capital injection into DFIs and banks helped these banks to remain liquid.

New Risk Management Paradigm

Adopting suitable and appropriate strategies ad formulation of adequate policies toward risk management should be systematically encouraged and developed starting from Board level to all downwards levels. It is also to be considered as a conscious policy objective at the regulator's level. This matter was taken up for discussion in the Basel Committee meeting held in September 1997 and it was decided that a suitable risk management policy should be adopted by all central banking institutions they regulate. Thus, in India, both RBI and the respective banks are equally responsible for implementing risk management system. Hence, proper initiative should be taken by RBI to integrate into its overall regulatory and supervisory framework the risk management policies and practices and the individual bank are to incorporate the same into their internal management.

In an attempt to accomplish its role, RBI issued a detailed guideline in this regard in October 1999 for implementation of risk management in banks embracing broadly the areas of credit, market and operational risks. Regarding credit risks, the RBI suggested that each bank should finalize a loan policy covering the methodologies for measurement, monitoring and control of credit risk duly approved by its board of directors. The portfolios should be evaluated on an ongoing basis rather than near about the balance sheet date. Current and potential risk exposures should be monitored on a daily basis.

Internal checks and internal control measures should be enhanced properly to prevent possible frauds or falsification of accounts due to employee infidelity or system lapse. Un resolved problems of un-reconciled inter-branch accounts, disputed debits to customers etc. should be properly addressed.

Application of information technology in banks should be considered as the most effective management tool and as such automation of banking operations and networking of should be taken up on top priority basis backed up by proper planning and adequate resource allocation.

It is to is to be recognized that banking is a specialized type of activity. Since banks have to handle large amount of other people's money and earn profits, they should know how to assess credit and how to keep accounts. Proper training and development are needed to train the employees in the relevant disciplines. This is to be taken care of both at the recruitment level as well as after recruitment by arranging proper on the job training and specialization through learning by doing.

Promotion and transfer policy should be redesigned considering the need and job skills required for effective performance and safeguarding the organizational efficiency. A person handling foreign currency matters in a foreign branch should not be transferred to a rural branch all a sudden simply on the ground that he or she has completed some given number of years at that particular assignment in the name of uniform policy implementation.

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No two institutions are alike when it comes to devising business risk management strategies and its adaptabilities with its organizational characteristics though all banks are guided by same business goals backed by the same regulation and supervision frame work. Organization –specific risk management strategies have to be developed according to the business mix, geographical segment covered, staff culture and detailed work practices in vogue in the respective banks. There should be some uniformity to match with the statutory regulations and supervision requirements but any point requiring special attention or special arrangement should not be lost sight of.

As the board of directors is the final authority to define and determine the risk strategies of a bank, it should review overall business objectives and the associated risk from time to time and advise the lower levels of management regarding quantum and variety of risks that can be accepted by the bank and issue necessary directives in this respect.

Before introducing any new product or service, its complexities and the associated risks should be thoroughly examined suitable risk monitoring and risk containment policies lay down and appropriate internal control measures developed. Officers and staff responsible for its functioning should be guided properly through in-house circulars, face to face discussion and issuance of requisite clarifications so that no mistake is committed in processing the loan proposal and monitoring the status of loan sanctioned on this account. The credit policy approved by the board should also cover the guidelines in regard to placement and posting of experienced and well-trained officers in credit department. Officers should be posted to credit department after they have put in certain minimum number of years of service and after acquiring sufficient exposure in credit appraisal techniques.

It has been found that in many cases funds sanctioned by the banks for a particular purpose were diverted by certain unscrupulous borrowers, thereby making the loan prone to become nonperforming. The banks have to develop appropriate ways and means to ensure that end use of funds particularly in respect of large borrowers. This loan review mechanism has to be affected on a regular basis so that weaknesses developed in the accounts may be suitably dealt with for corrective action.

For better co-ordination of activities and control risk, an efficient and effective internal management reporting system should be put in place. The reports should be comprehensive enough for meaningful analysis and effective interpretation. The reports generated from the system should be reviewed at short intervals and suitable guidelines may be issued to the operating levels. Each bank should appreciate that in an extremely competitive and fast changing environment, the key to success is to firmly put in place a comprehensive risk management system. Crisis management may be found helpful to protect against the downside but could not act as a guide to improvement and to attain the goal. Similarly contingency planning helps to be flexible enough to follow alternative plan to counter the unforeseen surprises in the chosen plan. Both these short-term options might help us reduce the negative impact but can never guide us reach the right destination.

Risk Management and Analysis

Risk management is basically identification, measurement, analysis and control of risk arising from the business in an attempt to alter in a desirable manner the states a system may reach and their probabilities or manage their consequences." A bank's overall risk can be defined as the probability of failure to achieve an expected value and can be measured by the standard deviation of this value". Risk management requires preparedness and quick reflexes to launch pre-emptive moves to counter emerging, altered scenarios. In running a business, maximization of profit should not be the only goal, but its maintenance on a sustainable basis is all the more important. So a firm should focus its strategy on risk –adjusted rate of return. The return has to be adjusted for the various types of risks associated with the business- be it lending or investing activities or issue of letter of credit.

Risk is contingent on a number of factors and accordingly there may be various types of risks and there is no end to its classification. But basically, in case of banks we come across three major categories of risks –market risks, credit risks, and operational risk and we shall restrict our discussion to these risks only. Market risks may arise because of movement in prices of commodities, currencies or equities mainly attributed to interest

rate, foreign exchange forward trading, investment in shares and bonds and similar derivatives. Credit risk implies the risk due to default in lending and counter party exposures. Operational risk covers a wide range of risks associated with the operation. Basel Committee has defined operational risk as follows: "The risk of direct or indirect loss resulting from inadequate or failed internal processes, people, systems or from external events". Operational risks may be subdivided into the following categories:

- Information Technology Risk: System failure, Internet virus, inaccurate data, poor quality of communication etc.
- Human Resource Risk: Lack in recruitment procedure, incompetent staff, holiday policy etc.
- Loss To Assets Risks: Risk of damage of assets and interruptions in business due to fire, flood, earthquake, or other natural calamities.
- Relationship Risk: Loss arising out of changes in the relationships among different components of business such as changes in regulation, claims, customer satisfaction, lawsuit etc.

The Goals of Basel Norms

- In the late eighties, there was a lot of cross-border lending particularly by the Japanese banks. Japanese banks grew enormously and gathered market share. Western banks complained about Japanese banks being regulated badly.
- Basel I was an attempt to standardize the regulation governing the global banking industry.
- The heart of the Basel Norms defined minimum required equity capitalize an attempt to contain leverage.

Measurement of the expected risk is not a very easy task as there is no absolute reliable methodology. It is a mixture of art and science. There is wide variation in the range of accuracy in measuring different categories of risks. Market risks can be measured almost to the extent of 90 % of the total risk reliably with the use of VAR (Value at Risk) technique. But in the case of credit risk about 30 to 40 percent to the total risk could be

quantified. Other techniques used in the measurement and analysis include stress testing, back testing and scenario analysis. Stress testing address the large movements in key market variables that lie beyond the day-to-day monitoring but that could potentially occur.

Risk managers select a set of moves for certain major market parameters and then subject the current portfolio value. Back testing is the process of comparing actual profit and loss with internally generated risk measures in order to test the efficacy of the internal models. It is not a one-time evaluation of a model but an ongoing process in which at regular interval the number of exceptions over a particular period is noted. Scenario analysis is a strategic technique that enables a firm to evaluate the potential impact on its earning streams of various different eventualities. It uses multiple projections and helps the firm to assess its longer-term strategic vulnerabilities.

For the analysis and management of interest rate risk the major techniques adopted includes, Gap analysis, Duration analysis, Value at Risk (VAR) and simulation technique.

Gap is the difference between rate sensitive assets and rate sensitive liabilities. As such it measures the difference between a bank's assets and liabilities and off-balance sheet positions, which will be re- priced or will mature within a predetermined period. An estimate of the average time required before the discounted value or the present values of all cash flows can be recovered by an asset holder including that of bank's depositor is made of the maximum potential loss in a position over a given holding period at a given confidence level. Simulation model tries to determine whether the model adequately captures the bank's current and projected cash flows keeping in view the different interest rates the different interest rates and market price scenarios. It is an interactive process and not an optimization model.

Determination of operational task is still in its intimacy and no scientific model is available which is quite reliable. However, at present level several methods have been used including appropriate statistical distributions to estimate operational VAR. But due to the difficulty in identifying the right statistical distribution that determines the severity and the frequency of a particular category of operational loss we may take advantage of Extreme Value Theory (EVT) and Monte Carlo Simulation Methods. But in India, banks are facing certain difficulties in employing these statistical models for measuring levels of risks associated with different banking activities. For eg. We can mention two to three points:

Firstly, to utilize these statistical models to our best advantage, a strong data-base on several variables is required. But such database is yet to be fully developed. We can take an example; in VAR model we measure the risk that the market value of the portfolio will decline as a result of changes in the interest rates, equity prices or exchange rates. So, we need historical data or times series data on these variables. But there is lack of such reliable data. Further, as the financial markets in India are not yet fully developed it is difficult to decide as to which type of probabilistic distribution model is relevant in Indian conditions.

Secondly, to be effective, these models require proper feedback mechanism and appropriate and adequate technological support. But many of the Indian banks are far behind in this regard and this is mainly because of resource constraints. Thirdly, the skill and knowledge base of the banking personnel in India is yet be matured fully to operate and handle these sophisticated techniques. It requires proper training and adequate experience, which is still wanted at large.

To start with, simple risk management techniques may be employed to overcome these difficulties. And then we can gradually, move to more sophisticated techniques till the requisite skill is developed.

Some points that may help banks to promote their risk management system are as follows:

1. Risk management should be actively and continuously promoted throughout the organization to anticipate and mitigate all categories of risks.
2. Adequate competence should be developed through recruitment; training and development of employees to make them efficiently handle the tools and techniques of modern risk management system.
3. Proper infrastructure should be put in place supported by appropriate technological back up to facilitate implementation of planned risk management strategy.
4. International best practices should be incorporated in building risk management frame work.
5. Systems and procedures adopted for risk management should be under constant review for its adaptability to the changing circumstances as well as for their improvements.
6. Contact and continuous dialogue should be maintained with peer organization, banking associations, academic bodies and international institutions to stay up to date.
7. Suitable methods and experiences may be gathered from insurance sector for gainful utilization.

Modeling Bank Behaviour in Credit Markets

A bank is a multi –product firm, with a portfolio consisting of non-securities loans, as well as securities issued by non-government entities and federal, state and local governments. In addition, a bank generates revenues from fee-based contracts and speculation /participation in the market for off-balance sheet items. In developing countries, the choices facing the banks are usually fairly limited, partly because of government regulations, but also because of missing or underdeveloped markets for assets and instruments such as equity and financial derivatives. The political economy of most of these countries ensure that all government securities carry the implicit or explicit guarantee by the federal government. That is, it is possible to think of banks in developing countries having two board choices; they can either invest their resources, net

of the cash reserve ratio and other regulatory caveat, into safe government securities or disburse them as credit to the non-government sector, where all such credit is inherently riskier.

The CDR of a bank would be expected to increase with the expected return on the non-government assets and decrease with the risk associated with such assets and also the degree of risk averseness. Asset pricing theory suggests that risk and return are positively related alternatively, since a bank loan is similar to a coupon bond held until maturity, the risk associated with a bank loan is a credit risk, not an interest rate risk, and it can be argued that the expected returns from a bank loan is simply a linear function of the credit risk. In other words, the inclusion of both a measure of risk and expected returns in the specification is likely to give rise to co- linearity.

Therefore, the specification can be further reduced to a functional relationship between the CDR and both the credit risk associated with loan disbursals and the risk averseness of the banks. Given that banking is a relationship –based activity the borrower pool for any bank is usually restricted by the geographical coverage of its branch network and its regions of operation. In this study, geographical coverage is measured by the number of branches. Further, it is important to consider that the policy legacies of Indian banks that led to large rural networks (Bhaumik and Mukherjee, 2002) and treat Indian as being comprised of broadly two large regions, rural and urban. This is taken into account by using the proportion of the branch network that is in rural areas. Since a large branch network enables a bank to minimize the risk associated with its portfolio by diversification across a large number of borrowers ,it is expected that the CDR increases with the size of the branch network (BRANCHES) .On the other hand ,given the reasonable assumption that inadequate collateral ,missing secondary markets for collateral and higher transactions costs associated with contract enforcement in areas that are not well connected to urban centers ,plus the political economy of loan forgiveness ,make credit disbursal in the rural market more risky than the urban credit market. Thus, it is expected that CDR is inversely related to the proportion of branches in the rural areas (RURAL).

The risk averseness of a bank can arise from two different sources. Firstly, a bank may be innately risk averse, but may also be reluctant to take risk on account of factors such as, the impact of past behavior with respect to credit decisions. In India, the degree of innate risk averseness bank is not difficult to measure and initially, it can be argued that banks with different ownership patterns (OWNERSHIP) have different levels of innate risk averseness. However, it is difficult to predict a priority the exact relationship between ownership and risk averseness. For example, in principle it can be argued that a foreign bank may be more risk averse than a domestic bank due to less knowledge of local credit markets and fewer informal options with respect to enforcing contracts. On the other hand, it can also be argued that the Indian assets account for a very small proportion of the overall asset base and therefore a foreign bank would be willing to take risk to capture market share.

The second measure of innate risk averseness in banks is likely to have a predictable relationship with the choice of CDR. All banks in India are required by the Reserve Bank of India (RBI) to maintain 25 percent of deposits in the form of safe and liquid assets, mostly in the form of government securities. However, since the mid1990's most bank's have voluntarily invested much more than 25percent of their assets in government securities, behavior that in Indian policy circles as "lazy banking".

The rationale for lazy banking is the risk associated with credit disbursal in a developing country with attendant economic cycles and underdeveloped legal institutions to enforce contracts and also awareness of the responsible banks that they may not have the necessary expertise to screen potential borrowers. Thus, lazy banking is a manifestation of risk averseness. Therefore, the ratio of banks' exposure to government securities, as a percentage of deposits, in excess of the required 25 percent, to the median exposure of all the banks in the sample is used as a measure of risk averseness (Ex gov securities). iv clearly a high value for this variable would indicate a high degree of risk averseness. In order to avoid endogeneity problems, the risk aversion variable is lagged one period.

Legacy may also have an impact on the risk averseness of a bank in two different ways. Given that the Indian banks are expected to abide by the prudential norms laid down by the RBI, if past lending of a bank results in accumulation of non-performing assets, it imposes a cost on the bank in the form of both higher capital requirements and high cost of capital. This cost of capital might then cause a bank to restrict its lending activities so as to reduce further the capital requirement. Conversely, a bank with a large stock of bad or doubtful assets may wish to expand operations rapidly to make up for past losses and or to become too big to fail (see, e.g. Randall.1993). Hence in this study, past evidence of NPA is used as a measure of regulation and/or legacy induced risk averseness (NPA).

The RBI also requires banks to reserve a stipulated minimum share of disbursed credit for the priority sector, which is comprised largely of agriculture and small firms. Banerjee, Cole and Duflo (2003) have noted that the average risk associated with priority sector lending is high, thereby giving banks an incentive to not fulfill their priority sector obligations, if possible. Cognizant of this agency problem, the RBI imposes a statutory penalty on banks that fail to meet their priority sector obligations a defaulting bank is required to invest the difference between its required and actual exposures to the priority sector in government bonds yielding below –market rates of return. Despite the penalty, however data suggest that in any given year some banks are unable to meet the RBI regulation on priority sector lending. This raises the possibility that either the penalty is not well enforced or that the penalty is not commensurate with the gains accruing to a bank that does not expose itself significantly to the risky priority sector. In other words, if a bank does not meet the minimum required exposure to the priority sector in year t-1 ,there are two possible outcome in year .The bank can either decide that the RBI's priority sector lending norms are well enforced ,or it braces for a RBI-imposed penalty and hence compensates for its errant past by increasing its exposure to priority sector lending. In the former case, the risk averseness of the bank in period is likely to decline while in the latter case, its risk averseness in that period is likely to increase. As with investment in government securities, a proxy for this risk aspect of aversion is the ratio of a bank's distance from the RBI mandated lower limit for priority sector exposure to the

median distance of all the banks in the sample (PRIORITY). Risk averseness would increase or decrease with this measure depending upon the effectiveness with which the RBI enforces priority sector lending requirements.

As above, possible endogeneity is avoided by using a lagged value in the estimation.

Finally, we have to take into account the impact of the overall state of the economy (that drives the demand for credit) and regulatory changes on the impact on the CDR of banks. The rationale for controlling for the demand for credit (DEMAND) remains in the significant volatility in India's industrial and overall growth rates since the mid-1990s.

STRATEGIC CREDIT RISK MANAGEMENT

Credit risk is the risk that a financial institution will incur losses because the financial position of a borrower and it is difficult to calculate write-off and reserve amounts in light of the collateral and other security status for individual borrowers ,it is acceptable to use a single expected loss rate for each group of credits to "in danger of bankruptcy "borrowers below a set threshold value for which group expected loss rates are applied shall be within a range deemed rational in light of the size and nature of the assets of the financial institution under inspection and calculations of expected loss rates must of all losses, including direct write-offs, indirect write –offs ,relinquished credits and losses on credit sold.

It is recognized that a good risk management process for banking should start with the credit sanctioning process itself. The Indian industry is now exposed to the chill winds of competition, accentuating the concern about credit risk. In response to the macro environmental changes, strategy, policy, procedures and control measures have been adapted.

In conclusion, with Booz, Allen& Hamilton, credit approval and monitoring process and mechanism have been revamped.

While due diligent scrutiny of project continues to form the basis for credit sanction greater emphasis s being laid on certain aspects in the light of emerging scenario. The credit function is carried out by a multi-disciplinary team. Broadly speaking, project evaluation covers promoter's background and track record, organizational adequacy managerial capability, technical feasibility, commercial prospects, international competitiveness, financial soundness,

Economic justification and last but not the least the environmental impact. Benchmarks are set for various financial parameters like current /debt equity ratio, debt service coverage and other profitability ratios with flexibility for deviations on justifiable grounds; realistic financial projections based on valid assumptions and sensitivity analysis also form part of the appraisal exercise. As a part of streamlined system of risk management, a well-articulated lending policy statement is kept updated from time to time with board's approval. Operational manuals are available handy for the operating staff to provide guidance and ensure uniformity in standards. Credit sanctioning powers stand shifted from individuals to committees at various levels- zonal, head office and board levels. The committee based sanctioning process is intended to ensure greater transparency, collective, application of mind and objectivity in decision-making-which all should go to minimize the risks inherent in the business of lending. Carefully calibrated delegation of powers is in place for various matters concerning credit sanctioning and disbursals. Loan documents contain besides standard conditions, transaction-specific or project –specific safeguarding covenants. Invariably, collaterals are secured for the loans. However, prudence in lending demand more than good credit appraisal standards and process or covenants and collaterals. Prudential limits are therefore set for exposure to any single corporate or group of corporate in relation to the banks own net worth and to that of the company /group. Besides, the degree of concentration of credit to a particular industry or sector is limited to a reasonable extent. Such limits are also prescribed by the regulators.

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A comprehensive risk rating system is in the process of refinement to ascertain the overall risks of lending, provide critical inputs for determining prudent exposure level and setting pricing and non-pricing terms for individual loans. It also facilitates meaningful evaluation of portfolio from time to time for necessary corrective action. A separate credit risk management group has been formed to carry out independent risk analysis of credit proposals so as to enable the credit sanctioning authorities to take appropriate credit decisions including determination of exposure levels, risk-based pricing and risk mitigating covenants.

A general awareness of the significance of structured risk management system is discernible. In the wake of mounting level of non- performing loans and sporadic instances of scams and systemic hiccups, the area of risk management has caught the closer attention of regulators. Reserve Bank of India has set out detailed guide lines on credit risk management for Indian Banks. The Bank of Indian, no longer content with traditional measures like exposure limits and credit rating, are in the process of overhauling their entire system of risk management. The banks will be moving towards Risk-Adjusted Return on capital frame work for appraising of loans which calls for data on portfolio behavior and allocation of capital commensurate with credit risk inherent in loan proposals.

CREDIT RISK MANAGEMENT PRINCIPLES

While financial institutions have faced difficulties over the years for a multitude of reasons, the major cause of serious banking problems continues to be directly related to lax credit standards for borrowers and counterparties, poor portfolio risk management or a lack of attention to changes in economic or other circumstances that can lead to a deterioration in the credit standing of a bank's counterparties. This experience is common in both G-10 and non-G-10 countries.

Credit risk is most simply defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms. The goal of credit risk management is to maximize a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. Banks need to manage the credit risk inherent in the entire portfolio as well as the risk in individual credits or transactions. Banks should also consider the relationships between credit risk and other risks. The effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organization.

For most banks, loans are the largest and most obvious source of credit risk, however other sources of credit risk exist throughout the activities of a bank, including in the banking book and in the trading book, and both on and off the balance sheet. Banks are increasingly facing credit risk (cotemporary risk) in various financial instruments other than loans, including acceptances, interbank transactions, trade financing, foreign exchange transactions, financial futures swaps, bonds, equities, options and in the extension of commitments and guarantees and the settlement transactions.

Since exposure to credit risk continues to be the leading source of problems in banks worldwide, banks and their supervisors should be able to draw useful lessons from past experiences. Bank should now have a keen awareness of the need to identify measure, monitor and control credit risk as well as to determine that they hold adequate capital against these risks and that they are adequately compensated for risks incurred. The Basel Committee is issuing this document in order to encourage banking supervisors globally to promote sound practices for managing credit risk. Although the principles contained in this paper are most clearly applicable to the business of lending, they should be applied to all activities where credit risk is present.

The sound practices set out in this document specifically address the following areas:

i) Establishing an appropriate credit risk management
ii) Operating under a sound credit-granting process
iii) Maintaining an appropriate credit administration

iv) Measurement and monitoring process

v) Ensuring adequate controls over credit risk.

Although specific credit risk management practices may differ among banks depending upon the nature and complexity of their credit activities, a comprehensive credit risk management program will address these four areas. These practices should also be applied in conjunction with sound practices related to the assessment of asset quality, the adequacy of provisions and reserves and the disclosure of credit risk, all of which have been addressed in other recent Basel Committee documents.

While the exact approach chosen by individual supervisors will depend on a host of factors, including their on-site and offsite supervisory techniques and the degree to which external auditors are also used in the supervisory function, all members of the Basel Committee agree that the principles set out this paper should be used in evaluating a bank's credit risk management system. Supervisory expectations for the credit risk management approach used by individual banks should be commensurate with the scope and sophistication of the bank's activities. For smaller or less sophisticated banks, supervisors need to determine that the credit risk management approach used is sufficient for their activities and that they have instilled sufficient risk-return discipline in their credit risk management processes.

The Committee stipulates in Section II through VI of the paper, principles for banking supervisory authorities to apply in assessing bank's credit risk management systems.

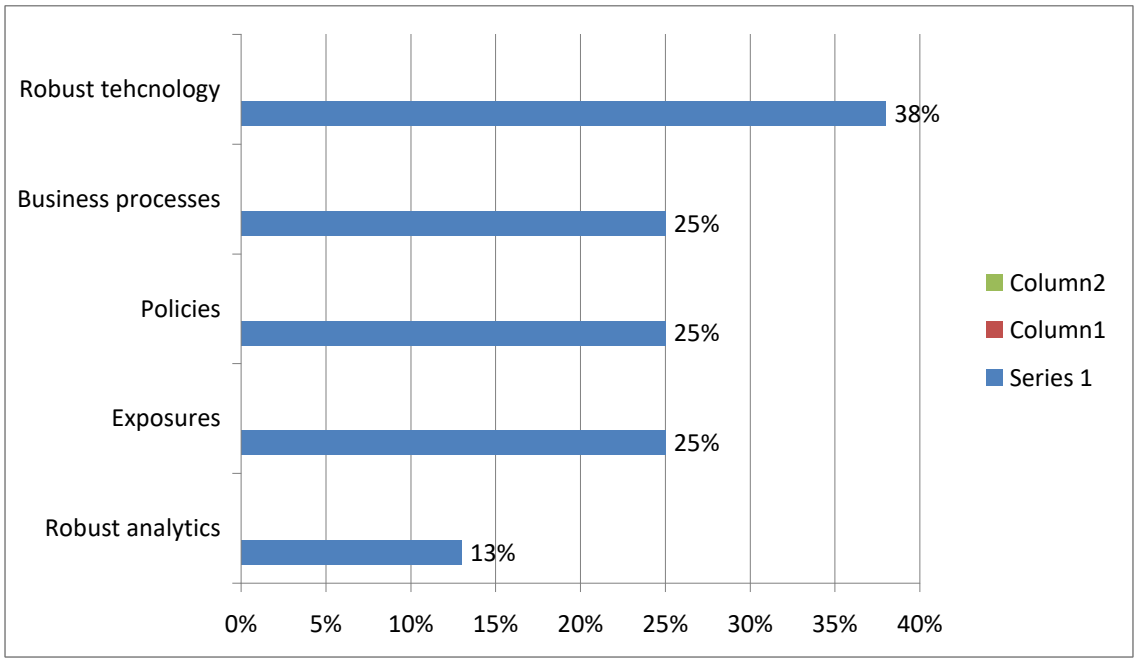
In addition, the appendix provides an overview of credit problems commonly seen by supervisors.

A further particular instance of credit risk relates to the process of setting financial transactions. If one side of a transaction is settled but the other fails, a loss may be incurred that is equal to the principal amount of the transaction. Even if one party is simply late in setting, then the other party may incur a loss relating to missed investment opportunities.

Settlement risk (i.e. the risk that the completion or settlement of a financial transaction will fail to take place as expected) thus includes elements of liquidity, market, operational, and reputation risk as well as credit risk. The level of risk is determined by the particular arrangements for settlement. Factors in such arrangements that have a bearing on credit risk include: the timing of exchange of value payment /settlement finality and the role of intermediaries and clearing houses.

Key Components of Effective Credit Risk Management

Effective credit risk management is a critical component of a bank's overall risk management strategy and is essential to the long-term success of any banking organization. Over all the components of effective credit risk comprise active Board and Senior Management oversight sufficient policies procedure and limits adequate risk measurement, monitoring and management information system and comprehensive internal controls. Lepus sought the opinions of industry participants on the key components of effective credit risk management. The responses of the eight banks interviewed are summarized in the graph below:



Source: Lepus *Key components of effective Credit risk management*

Robust technology and business processes robust technology was mentioned as a critical component of effective credit risk management by 38% of the interviewees. It is thought to help banks identify measure, manage and validate counterparty risk although it is of little value without effective credit risk policies and business processes in place.

Policies: In 25% of the banks, having a comprehensive and strategic vision for credit policy is vital as it sets guidelines for businesses giving rise to effective credit risk management. These guidelines include a set of general principles that apply to all credit risk situations as well as specific principles applicable to some countries and types of counter parties and or transactions.

Exposures: In 25% of the interviewed banks, the ability to measure, monitor and forecast potential credit risk exposures across the entire firm on both counterparty level and portfolio is vital.

Robust analytics: A key component of an effective credit risk management strategy suggested by 13% of the banks is having robust risk analytics. Efficient and accurate credit analytics enable risk managers in banks to make better and more informed decisions. The availability of better information, combined with timeliness in its delivery, leads to more effective balancing of risk and reward and the possibility of higher long-term profitability.

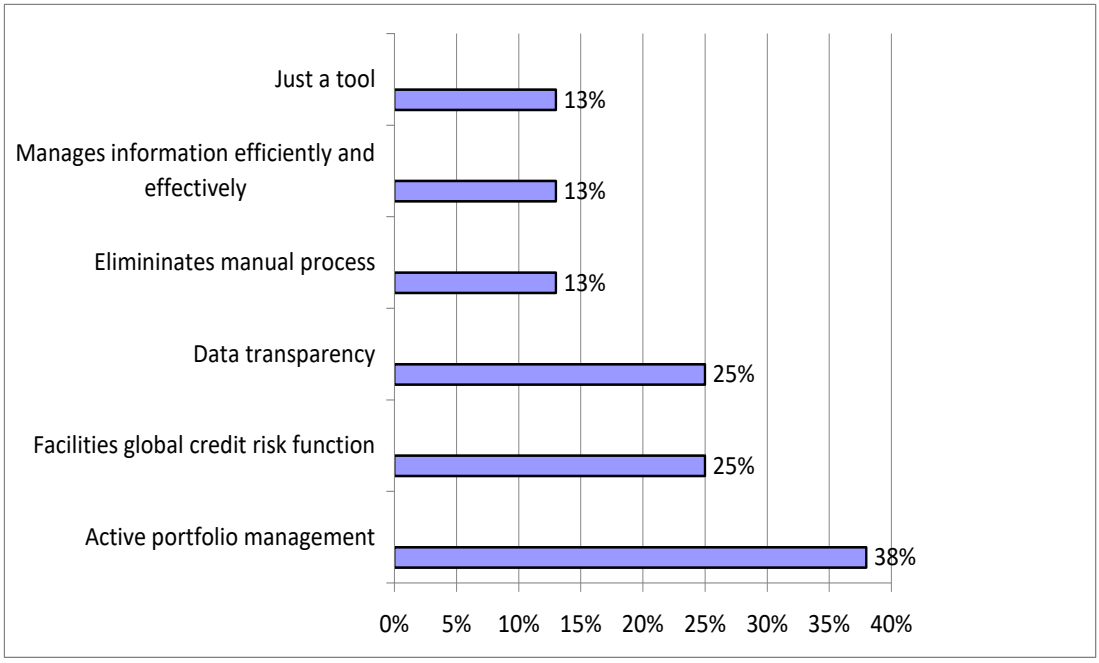
Others: The other ingredients of effective credit risk management were thought to include credit risk transparency, defined credit decision process, sophisticated risk measurement methodologies, stress testing, timeliness and accuracy of risk calculations as well as efficient credit risk reporting.

Role of Technology in Credit Risk Management

As mentioned, technology is widely acknowledged to be a key component of effective credit risk management. Lepus thus sought industry opinions on how important IT is for achieving best practice in credit risk management.38% of the interviewees stated that technology plays a significant role in enabling active portfolio management and

assessment. This is followed by data transparency (25%) and facilitation of global credit risk function (25%). Subsequently, technology facilitates elimination of manual processes and allows information to be managed in an efficient and effective way.

Role of Technology in Credit Risk Management



Furthermore, one bank stated that while technology can help banks to facilitate innovative credit risk management procedures, it is simply a tool and is useless if misused. Another opinion expressed by one of the interviewees is that technology plays a bigger role in the trading book than in the lending book as it enables key questions to be answered such as the cost of credit risk.

Drivers Of Effective Credit Risk Management

Regulatory Requirements

Basel II was highlighted as one of the main drivers in shaping the banks approach to credit risk management. This is primarily because it imposes disciplinary capital charges for procedural errors, limit violations and other operational risks. It also creates new pressures to ensure that effective credit risk management controls are in place. A leading

investment bank, for example, commented that regulations drive their credit risk management procedures. The bank is forced to provide more detailed disclosures in their annual reports. These may include information on its strategies, nature of credit risk in its activities as well as information on how they manage credit risk.

Basel II will affect a number of key elements in another European Bank, including a more rigorous assessment of the bank's credit risk appetite, more technical approach towards their counterparties and better portfolio risk management. Another bank mentioned that the impact of Basel II is largely dependent on the environment they are regulated under as it is different for each region.

Best Practices in Credit Risk Management

While regulatory compliance is indeed significant driver, most banks credit risk management aspirations span beyond this. Key players also seek to gain competitive advantage thorough effective credit risk management.

The objective of best practices in credit risk management is to provide comprehensive guidance to better address credit risk management. The findings from Lepus 's survey illustrate that credit risk management practices differ among banks as it is dependent upon the nature and complexity of individual bank's credit activities. Sound practices should generally address the following areas:

(1) Establishing an appropriate credit risk environment
(2) Operating under a sound credit –granting process
(3) Maintaining an appropriate credit administration, measurement and monitoring process
(4) Ensuring adequate controls over credit risk.

The feedback from banks demonstrates that centralization, standardization, consolidation, timeliness, active portfolio management and efficient tools for exposures are the key best practice in credit risk management. A tier -1 American Bank is considering having more efficient tools for "what if "analysis and tools to provide transparency to the business. This is particularly important for counterparty exposure at a firm –wide level.

In 25% of the interviewed banks, achieving best practice involves having an active portfolio management in the lending book along with real-time credit risk management. A leading investment bank identifies best practice as having good quality data, for example, identifying processes that induce data errors. Timeliness is another contributing factor. Real time pre-deal checking, effective credit limits management and country risk management are key to good credit risk practice in another bank. However, this is largely dependent on the market the bank is targeting.

Effective Credit Risk Management as A Value Enhancing Activity

If deployed correctly and effectively, credit risk management can be a value enhancing activity that goes beyond regulatory compliance and can provide a competitive advantage to institutions that execute it appropriately. Some of the examples demonstrating the statement above include consolidating credit lines for customers in order to achieve greater business activity, efficient use of capital risk adjusted return through Basel II implementation and International Swap Derivatives Association's (ISDA) Credit Support Annex (CSA) allowing banks to deal with lower rated entities.

Consolidating Credit Lines

Consolidating credit lines allows one bank to manage capital adequacy more efficiently. For instance, all of the bank's global customers such as Ford Motor Company have consolidated global credit lines across multiple countries such as the UK, Germany and Singapore. By deploying global credit lines, total credit is reduced thus allowing for more business activity.

Efficient Use of Economic and Regulatory Capital

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Efficient Use of Economic and Regulatory Capital

Having consistent, comprehensive risk architecture will make it easier for banks to calculate and manage capital. Banks mainly in the USA and Europe use economic capital for the following reasons:

To ensure that the bank has a safe level of capital to guard against risk and to meet regulatory requirements.

To price loans to earn attractive risk adjusted profits.

To apply economic capital's trio of core decision making criteria (risk, capital requirements and returns) in strategic business planning and to measure return on equity (ROE) by line of business, product or customer to ensure that capital is effectively allocated among different activities in a bank to maximize shareholders value.

Once the economic capital is computed across the bank, the bank's actual equity capital is allocated to individual business units on the basis of risks so that shareholders wealth can be maximized. There are two ways to ensure that the amount of capital is appropriate to the risk it faces. The first is to ensure the risks are not excessive, given the capital. The second is to ensure that capital is adequate, given the risks.

If the economic capital exceeds economical capital exceeds the regulatory capital, there is no problem. If the regulatory capital exceeds economical capital, the excess can be treated as a cost (regulatory overhead) leading to increase in the hurdle rate of the bank. This cost can be allocated on a pro-rata basis to all elements of economic capital so that every unit of the bank is equally sharing the burden of regulatory requirements.

CSA

ISDA's CSAs are used extensively in several of the interviewed banks (with most of their counter parties) as they add significant value to the firms. These banks have signed CSAs with a large majority of their counterparties in order to call for daily cash collateral cover of all outstanding positions. The major benefits gained from daily collateralization are the reduction in risk amounts and capital usage and significant shortening of the potential future exposure risk window. Many of the banks monitor the number of overdue master agreements and overdue trade confirmations, as they could affect the bank's ability to net collateral against to net collateral against the gross exposure. Late payments or disputed calls are other potential indicators of operational problems, which could impact on the effectiveness of credit management.

Use Of Derivatives to Reshape Credit Profile

Credit portfolio management is a value enhancing activity as some of the interviewed banks use credit derivatives to reshape their credit profiles. The use of credit derivatives in one tier-1 bank has significantly reduced its financial markets credit risk from between 70% and 75% to between 40% and 45%. Credit derivatives create new possibilities for risk transformation through innovative structures may involve the indexing or reinsuring of illiquid middle market and the creation of short positions in credit risk. This will

greatly increase the power and flexibility of portfolio strategies. Hedging decisions are largely made by banks separate portfolio management groups and senior management teams. Some of the interviewed banks use credit derivatives for active portfolio management, to offset exposures such as inventory and loans to examine the industry's portfolio and concentration portfolio across the institutions and to mitigate exposures. The benefit it gained from using this activity typically led to reduced regulatory capital, freeing up credit lines and allowing firms to effectively manage credit exposures.

Technology

Along with credit derivatives, technology can also contribute to reshaping banks credit profile by allowing banks to know the type of exposures and price transactions they are dealing with. These elements are required to hedge exposures.

Achieving Enterprise-Wide Credit Risk Management

Many leading banks have abandoned the traditional approach of managing risk. Instead, banks are adopting an enterprise credit risk management approach that gives an integrated view of the risks faced by the organization. A tier-I investment bank regards enterprises edit risk management as the entire banking infrastructure that excludes IT. This includes credit risk, market risk, financial control, telecommunications and data centers in the corporate bank. Technology is excluded as it is considered to be an external entity.

Implementing a scalable and consistent enterprise risk management frame work is a challenging task for many banks. To measure price and manage credit risk effectively at the enterprise level, banks have to integrate a variety of disparate systems. These systems should be able to collect substantial quantities of data on credit ratings, credit transitions, loss experiences, rating and default histories in addition to a variety of other relevant credit information.

Banks achieve enterprise credit risk management through various strategies. One American bank mentioned that their global credit risk management is mainly facilitated by technology, whereas, another leading American bank has a risk officer to manage all the risk groups within the firm. One of the banks mentioned that their Risk-Over Sight Committee including the Head of Credit Policy meet on a regular basis to discuss the bank's risk appetite. A third investment bank uses a technology solution to achieve enterprise credit risk management. This system provides accurate global limits and credit exposure information in real- time for increased transparency across the bank and greater operational efficiency.

Some of the issues raised by the banks include analytics for portfolio analysis and for complex derivatives, back testing of these analytics, adopting a standard approach to analytics and the ability to keep up with new products.

While the bank has admitted that at the enterprise level there should be a standardized approach, it is challenging to roll it out in individual areas, where individual requirements are far too specific. The bank gave an example of the lending book, saying that it is virtually impossible to summarize decisions for the whole of the lending book. Furthermore, the bank stated that it is hard to categorize things in a wider context. They are currently doing some analysis of broad economic capital implications however they still believe that a single credit measure will never give them a full picture. One tier-2 bank has some home-grown credit risk management solutions to address some of the problems stated above. Another bank resolves their issues with analytics by applying more potential exposure simulations to their products. A leading investment banks main challenge with analytics is the ability to efficiently manage the products, accurately measure credit risk and achieve good quality data. Consequently, the bank has a team of mathematicians and programmers to enhance these areas.

It is important to ensure accurate and transparent reporting. However, many banks find this to be challenging.38% of the interviewed banks, all of which were tier-2 institutions are experiencing some problems with reporting, mainly relating to timeliness and consistency of terminology across the broad. One of the banks has too many reports, which results in problems with identifying common trends. The bank is overcoming this issue by consolidating their existing reporting systems so that an enterprise –wide reporting tool can be obtained.

A further bank stated that if there were any existing issues with data. It would ultimately have a knock-on effect on the coverage of the report. For that reason, the bank constantly tries to address this problem by enhancing their current reporting tools. In contrast, according to our interviews 38% of the banks generally do not experience major problems with their reporting. This is mainly due to banks having good reporting infrastructure and global reporting systems in place. This said, one needs to keep in mind that from our extensive industry experience, no bank has so far achieved adequate ability to report aggregate credit exposures across the whole enterprise.

Integrating Market and Credit Risk

The integration of market and credit risk measurement requires the ability to interview the concept of VAR with a credit risk model. Basel II for instance prompts banks to consider the correlation between the different risk types and the most appropriate way to mitigate the bank's exposure. Essentially the risk types interrelate, for example market volatility impacts the value of collateral, which has an impact on banks credit risk. Managing the relation between these risks and mitigating exposure to them through a single, highly integrated risk management technology framework ensures banks meet the demands of the accord.

Furthermore, integrating market and credit risk into a single risk management system will ultimately be cheaper and more productive than maintaining separate market and credit risk systems. It also enhances the decision –making process and allows banks to better adhere to current "best practice "guidelines and emerging regulations thus making

regulatory reporting a far simpler task. Banks perspective on the value of integrating market and credit risk were varied, remaining mainly positive.

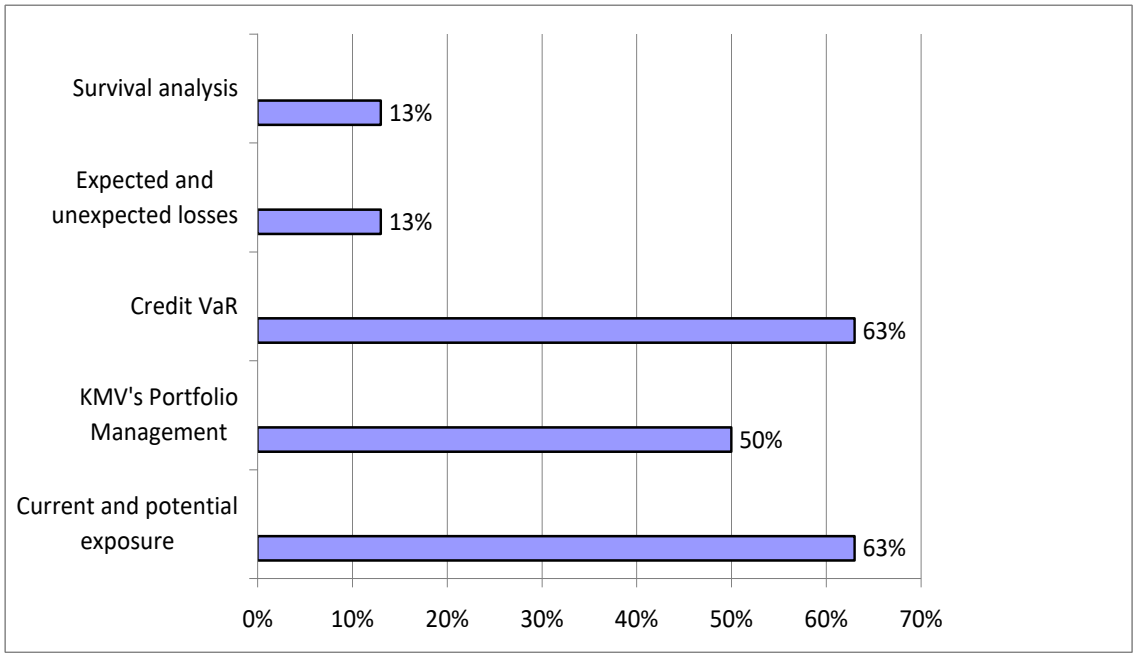
A tier-2 investment bank explained that by integrating credit and market risk, the components of trade prices could be distilled as well as improving market trading measurements and pricing reserves. Another tier-1 bank mentioned that from a risk appetite point of view, aligning the information required to manage market and credit risk would result in cost savings and consistent data. A third bank commented that the insight of the overall risk return decisions would be gained instead of individual risk.

Having acknowledged all the benefits of integrating credit and market risk outlined above, some of the banks have already launched IT projects in this area. By way for example, one tier 2 bank has integrated their market, credit, operations and liquidity risk systems into one data architecture and one risk engine. This draws information from across the bank‘s activities and feeds it into a network of unified engines. It powers the front, middle and back offices, providing decision support to trading desks, risk control, the back office, providing decision support to trading desks, risk control, the back office and senior management. The main purpose for this integration was for the bank to move away from silo model because it creates an excessive strain on the bank’s system. Fewer systems, and the simplification of a bank‘s overall technology infrastructures will reduce IT risks.

Methodologies Used for Credit Risk

Calculating counterparty credit risk enhances credit risk management capabilities but possess a variety of challenges. Current practice in credit risk management consists of expected and unexpected loss measures and portfolio management measures which require current and potential exposure calculations. Each type of measure serves a different purpose in credit risk management.

Methods Used to Measure Credit Risk

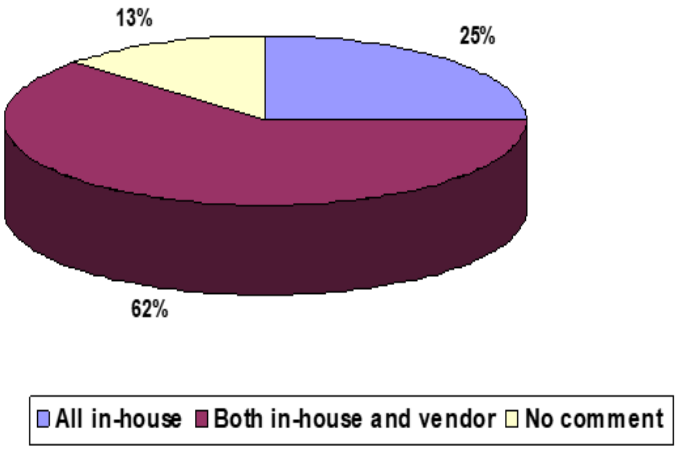


The majority of banks (63%) use current and potential future exposure calculations to measure credit risk. The purpose of exposure calculation is to support the assessment of portfolio and firm compliance with policies and guidelines, and to assess credit concentrations. To measure the current and potential future exposure of portfolio positions, banks need appropriate valuations of positions, as well as the ability to aggregate positions by counterparty, simulate future market values, net exposure where netting agreements allow and incorporate collateral to mitigate exposures. Subsequently, 63% of the interviewed banks employed Monte Carlo VAR and Moody's KMV model. The other methods used to measure credit risk include survival analysis and expected and unexpected loss. The benefit of calculating expected credit loss is to establish expected net returns to the portfolio. Unexpected credit losses are used to determine extreme potential credit losses to the portfolio. With regard to future plans, most of the interviewed banks are planning to either implement or further improve their Monte Carlo VAR. Other methodologies that banks want to implement in the future are daily stress-testing and migrating from single factor analysis to multi-factor analysis 25% of the banks anticipate adopting credit VAR. Additionally, one bank would like to employ more

sophisticated exposures across margining and netting. One bank will focus its efforts purely on enhancing and extending their existing methodologies such as their capital model Credit VAR, probability of default and stress testing.

Technology Used for Enterprise Credit Risk: Buy Versus Build

Only a quarter of the banks interviewed managed their enterprise credit risk entirely in house. The banks who have adopted this approach believe that home grown solutions are customizable to meet specific requirements. In contrast, 62% of the bank some form of the banks used some form of third-party vendor/consulting coupled with their home-grown solutions for enterprise credit risk management. Three of the interviewed banks further clarified the ratio of their in-house versus vendor technology.



Source: Lepus

Some of the interviewed banks have adopted early warning systems in order to strengthen the process of proactive risk management. The type of early warning system to monitor asset quality and risk exposures varies amongst banks. One type would be daily warning reports on credit that illustrate unmatched credit lines, trends, incorrect areas and solutions to address the problems. However, the bank using this warning report is considering migrating to an intra-day solution for monitoring risk exposures. Another type of early warning system would be reports such as Moody's credit ratings to monitor asset quality and risk exposures. An active periodic surveillance program is evident in

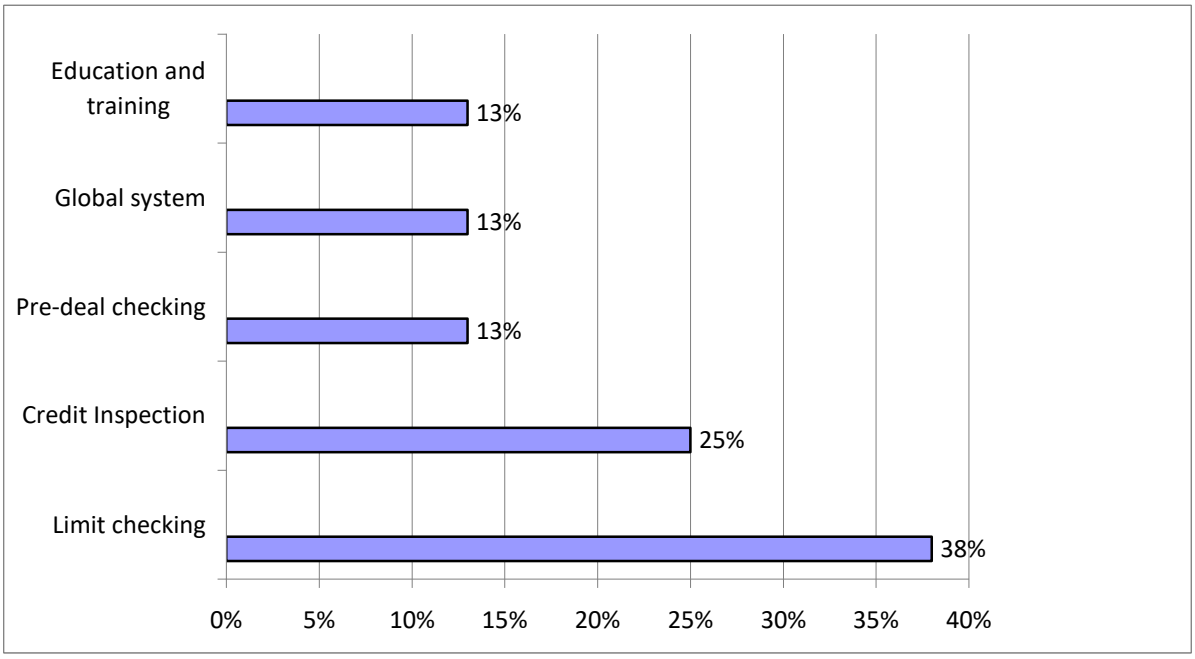
one bank. This program examined trends and price movements. Nevertheless, the bank anticipates moving towards a more proactive market approach. Daily stress testing is exercised in one leading investment bank. It has seven historical scenarios to monitor asset quality and risk exposures. The skill sets, experience and judgment of employees are also exploited to raise key issues. A further bank has a prototype system called "Early Warning" to monitor their risk exposures and asset quality. This system, which is currently in development, examines, share prices, market movements, credit default spread and ratings.

Adherence to Credit Policy

Monitoring Adherence to Credit Policies

Banks use a variety of methods to design and monitor adherence to credit policy. Some of the methods mentioned by investment banks include limit checking, credit inspection; pre-deal checking, global system, education and training.38% of the banks mentioned that credit limit checking was used to meet their credit policy requirements. The credit risk limit specifies the maximum exposure a firm is willing to take to counterparty.

Similarly, another bank uses a combination of both automated and manual controls checks to adhere to the credit policy. In terms of credit inspection, one bank has an internal audit group that inspects the quality of their credit. As for training to educate employees on credit policy one American Bank has outline training tests that help people to understand the requirements of credit policy. Recently, the bank has adopted a workflow training application, which highlights more effectively the new changes made to the credit policy. As a result, it enables employees to learn more about current policies.



Source: Lepus

Half of the interviewed banks have regular meetings to review their credit policy to ensure that it is up to date. The review process typically takes place on an annual basis. This is vital to ensure that policies are aligned with the economic climate. One of the banks is in the process of revamping their hedge fund policies with particular focus on what peers are doing and on staff turnovers.

The level at which credit policy is discussed varies from one bank to another, for example it can range from a business level to group risk level to Board level. At the Board level, the topics discussed tend to be about rating grades, set style and thresholds. At the business level, topics discussed tend to be about rating grades, set style and thresholds. At the business level, topics discussed include what type of opportunities is available and policies are written in alignment with these availabilities. Other elements to ensure that credit policy does not come out of date include commissioning industry studies and constant liaison with the regulators. Peer pressure was mentioned as a factor that encourages banks to be more efficient in managing risk policies.

Risk Concentrations and Credit Portfolio Management

Portfolio management has allowed significant growth in credit risk management sophistication which has moved from an exposure limitation and loss avoidance process to a process of active management and fine-tuning of credit risks taken in the portfolio. Active portfolio management results in measuring and limiting credit risks taken as well as optimizing the return gained for a given level of credit risk. Hence the main objectives of active portfolio credit risk management are improving risk adjusted returns, managing concentration risk, meeting regulatory requirements and enhancing revenues. Active portfolio management allows banks to be more profitable, specialized and risk-efficient business. In addition, banks can also attend to their clients' needs while reducing the risk of concentration and continuously evaluating transactions and portfolios against regulatory guidelines.

Tier-2 banks have moved towards credit portfolio management in the European market place. The practice has allowed the firm to enhance its risk /return ratio through greater liquidity of its credit portfolio, while enabling it to provide additional support to its clients. The "Portfolio Management Group "invests in and manages all assets and credit exposures, originated for the bank's book. Its key function is active management of credit portfolio to optimize its performance against return on economic capital and value-added profit targets. To achieve performance and concentration targets, the bank has adopted many techniques, both individually and in combination which are available to portfolio managers, including credit derivatives securitization and physical trading. The sophisticated use of these instruments has enabled the organization to support its client base to a far greater extent than would be possible using "traditional" credit management practices. It has also allowed the bank greater flexibility in developing and executing proprietary structured debt products.

In terms of monitoring risk concentrations and credit portfolio diversification, banks regard these as important factors. One of the main tools that help banks to monitor risk concentration and diversification is global reporting system, which produce aggregated credit risk reports and identify dangerous risk concentrations, which then can be eliminated through portfolio modifications.

An economic capital model is used to monitor one tier-1 Indian Bank's risk concentration and credit portfolio risk profile. Risk equity is assigned on a regular basis, which is the behavior driver for traders. In other words, economic capital provides an incentive for traders not to put on large concentrations in a given area as ultimately it will be expensive due to the equity charges. Hence, large concentrations will drive down bonuses for traders as it will be more difficult for trading to be profitable. Decisions on risk charges are made by senior management, namely the Head of Credit. The CEO is also briefed on the current concentrations on a quarterly basis. Furthermore, technology also plays a critical role in this process as it allows computing complex calculations providing numbers on both concentrations will drive down bonuses for traders, as it will be more difficult for trading to be profitable. Decisions on risk charges are made by senior management, namely the Head of Credit. The CEO is also briefed on the current concentrations on a quarterly basis. Furthermore, technology also plays a critical role in this process as it allows computing complex calculations providing numbers on which credit decisions are made.

Tier-2 banks suggest for using exposure risk systems as a way to monitor both concentrations and credit portfolio risk profile. They are currently in the process of replacing the system in order to stay up to date. Another key methodology is stress testing which gives visibility as to where the issues may lie. In terms of monitoring risk concentration, one tier-2 bank reports the concentration by ratings, sector and location to the Board on a quarterly basis. Another bank has a credit reporting group that manages the system, generating reports on concentrations for senior managers. These reports are formulated on a daily basis especially for top client lists.

Credit Hedging

Credit risk hedging is a means by which banks control credit risks they have already acquired and make acceptable the credit risks that they are about to acquire. Credit risk hedging allows banks to reduce or remove credit risks by having offsetting positions or by selling or terminating risk contribution positions. The ultimate goal is to optimize the use of banks capital so that risk is minimized for a given return. Hedging is commonly viewed as a risk mitigation mechanism. However, if used strategically, it can also enhance value, which comes down to making good business decisions. These include the following:

Expected losses: - Understand whether the deal will be profitable

Reserve methodology: - Allows the bank to make better economic decisions

Risk return: - Allows better trades to occur if the right decisions are made

Additionally, credit hedging can replace high counterparty risk weightings with low counterparty risk weights. This can effectively optimize return on capital in a loan portfolio, especially if the reduction in regulatory capital is greater than the cost of hedging using derivatives.

Some of the firms have also adopted internal credit risk hedging via desks whose purpose is to provide credit protection, at a transfer price, to other desks within the firm. Then they have the ability to choose how much of the firm's net exposure to each counterparty is to be traded to outside counterparties. The more decentralized organizations have desk-by desks hedging of credit risks. These developments will have an impact in the asset and liability management of banks that deal in derivatives. A large part of the counterparty risk of these banks will be transferred via dynamic ledging, hopefully increasing market efficiency.

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Credit Risk in Indian Banking: Yesterday and Today

Credit risk refers to the probability of loss due to a borrower's failure to make payments on any type of debt. Credit risk management, meanwhile, is the practice of mitigating those losses by understanding the adequacy of both a bank's capital and loan loss reserves at any given time – a process that has long been a challenge for financial institutions. By being exposed to credit risk banks have been faced with a lot of problems. The banks couple of years ago realized that credit risk is important and the banks need to monitor, identify, control and measure it is very significant. Due to this the effective management of credit risk has become a critical component of approaching risk management. This approach will be especially important in terms of the long term success of any bank. Banks now ensure that they have large amount of capital against any form of credit risks so that they can be in a position to adequately tackle any risks which will be incurred. Credit risk management has become all the more important in the current Indian policy environment of financial sector reforms, increasing deregulation and a move for privatization of public sector banks (PSBs). While these measures result in more autonomy for the banks, at the same time banks are exposed to more competition. Further, banks are expected to exert financial discipline on commercial sector by allocating credit judiciously through prudent and efficient credit risk management practices. Thus, the present-day emphasis is on credit risk management and profitability in banks. Following the financial crisis, banks, insurers, and capital markets firms have realized that the conventional methods of managing their credit risk, although important, may not always be sufficient. In addition to traditional credit risk methods, they are now looking at more adaptive and innovative approaches to managing risk. Additionally, there is a focus on understanding the interdependencies between credit risk and all the other types of risk as firms look for an integrated enterprise-wide risk management system. The traditional approach to managing credit risk has been based on establishing a limit of credit at various levels for the individual borrowers and sometimes also based on geographical area and industry type. Also, collateral and relationship exiting hardly seem adequate to cope with the declining economics of loan markets.

These limits specify the maximum exposures a bank is willing to take. In India, Credit Risk Management, collateral taken to secure a loan is no longer considered as a good Credit risk management technique. The paradigm of Credit risk management has shifted and shifted very considerably in this modern time In India, until the early 1990's, credit risk analysis was limited only based on the reviews of the loans of individuals and most of the banks kept the loans on their books for maturity. In recent years Indian banking industry has made strides in managing credit risk. Managing the credit risks is the main focus of any Indian Bank in its banking operation these days and many Indian banks are looking now from transaction management to portfolio management. And have slowly changed from monitoring to practicing and also predicting their performance. Indian Banks are still holding onto traditional credit risk management tools like Collateral, Guarantees, but these are now becoming more and more appreciated with various other strong forms of credit risk tools and models have been generated to measure and predict the performance and management of credit portfolio risks which in turn build competitive advantage. In the last decade so many Indian banks have started to make use of models which are developed by their own internally in order to assess the risks for their credit which they lend. Indian Banks are still not using Modern day Credit Risk models which are developed by Credit Risk Experts Internationally because the credit risk models are very complex and include algorithm-based methods of assessing credit risk with that these require higher level of Human expertise. The aim of such model is to help banks in quantifying, aggregating and managing credit risk. Despite the method the focus of Credit risk assessment stays credit quality and risk exposure.

Credit Risk in Indian Banking

Credit risk was not managed well; in particular, many "securitizations" of credit risk were unreasonably structured and unable to transfer the risk to a third party. Credit risk is considered as the gravest and "difficult to deal with" problem by most of the bank managers and also is blamed for the most devastated financial crisis of the world. Both insufficient and excessive regulators are known to be main reasons of inefficient credit risk management in banking systems which makes regulators be aware of necessities to

build a new regulation framework. Therefore, Basel III was born. 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, with the objective 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. Basel III has three pillars in continuation with BASEL II: standards for minimum capital requirements, supervisory review process and market discipline. The Basel Committee on Banking Supervision, under the Basel III rules, proposes that banks hold more and better-quality capital, besides having more liquid assets. Under BASEL III Norms, the minimum capital tier I was raised from 2.5% to 4.5% and even reached to 6.0% from 2012. Regulators introduced capital conservation buffer of 2.5% and also suggested ratios (Liquidity coverage ratio & Net stable funding ration) to measure and monitor liquidity risk as well which were earlier not consider in Basel I and II Capital Accord. Furthermore, Basel III increases transparency of banking systems and bring a new image for clients: safer, more perspective. Eastern Europe is one of the regions that register the most serious situation of credit risk. Nonperforming loans rate has been more than 10% for years, thus the Basel III accord is indispensable to prevent those countries from a “credit explosion” in a near future (BCBS 2010).

The guidelines prescribed in Basel I and Basel II Accord in 1988 and 2004 which laid much stress on capital adequacy norms (prescribed capital adequacy was 8%) and three pillars but now an improved version in the form of Basel III Accord finally arrived, laying batter and much needed stress on top quality capital that bank should hold adequately to fund them through periods of financial stress as well. Starting 2012, banks across the world already start implementing the Basel III norms. To follow the BASEL III norms, The Reserve Bank of India (RBI) issued a notification for the implementation of the Basel III capital regulations to Indian banks and as per the research report of Credit Suisse, the new norms will push up the capital needs of Indian banks by $20 billion to $30 billion (1 lakh crore to 1.5 lakh crore). Since banks will now need additional capital

for doing the same level of business, they may see a sharp drop in their returns on assets (ROA). Further, the incremental equity requirement in the Indian banking system may go to as high as Rs. 3.2 to 4 trillion over the next coming years. According to ratings firm ICRA, the government's share in this could be Rs. 1.2 to 1.7 trillion. When banks with low core Tier-I shore up their capital to around 9% (required 8% and 1% cushion), their return on equity (ROE) could drop by 1% to 4%, which they could seek to compensate by raising their lending yields, increasing fee income, or rationalizing costs. Indian Banks may need INR2.6 trillion of Additional Capital by 2012 as they strive to Meet Basel III requirements. At this point of time, the Indian banking system is well capitalized and managed than their counterparts in US/UK and will not be much affected by these Basel III norms. One main point should be noticed that, with the RBI permission, new banks are coming into the scene in India so BASEL III norms will pump additional capital into the system. Most Indian banks are not likely to be significantly impacted by the proposed new capital rules but emphasis on core capital and a conservation buffer could put pressure on banks' return on equity.

Basel III will be costly for Indian banks due to the capital required to be retained and the investment needed to implement changes. The complexity and number of IT systems and data stores, coupled with multiple business processes, make the task of architecting the Basel III changes a significant challenge. Indian Banks are required by the regulators to measure and report on the various aspects of Basel III. However, progressive and forward-thinking banks will be using Basel III for competitive advantage—a catalyst to review and upgrade current practices and processes to maximize a return on investment and ensure reported figures are truly correct, understood and trades optimized. The key areas for focus whilst implementing the requirements are: data management; modeling; predictive analytics; real-time risk monitoring; and application architecture and process design.

NPA's and Efficiency of Credit Risk Management in Indian Banks

The increase in non-performing Assets is not a phenomenon only seen in Western banks. In the medium term, it is clear that NPAs are also set to rise, for a different set of reasons, in expanding and emerging economies. According to a recent study by the Institute of International Finance (IIF), NPA rates in emerging markets such as Asia's and emerging Europe's continue to deteriorate with the outlook still being negative and with a direct impact on profits. NPAs would continue to increase around the world, rising by 16%, from 5.6% of all loans to 6.5 percent (Survey by Ernst & Young, 2012) Intended resolutions can come out only after the actual state of NPAs is disclosed. There are lots of hidden NPAs in the Indian banking system, where an interest servicing is shown at the quarter-end, to prevent classification of the loan as NPA. Not lending to supposedly risky ventures, or lending only with a 100% collateral (as some so-called healthy banks are doing) is also not a healthy solution for the economy. Willful defaulters will have to be dealt with a weighty hand, but political interference is a gigantic concern. The money being pumped into start-ups now is in the form of a share in the stake, rather than a loan. It is yet to be seen, where this trend lands Indian Banking Industry in the next 5 years. It is all about maintaining a balance between growth and risk-bearing advances. So here are below some points which show why NPAs are increasing in India:

First, Global Sluggish and Moderate Demand: Borrowers need loans for leverage and capital; but since earnings are slowing, customers have delayed their payments, profits are being compressed, exports (dollar value) are on a decline due to weak global demand, and these kinds of borrowers simply don't have money to pay back. For example, one of the most leveraged industries is the steel industry in India. With steel prices going off the cliff due to dumping by China, Korea and Japan, steel makers are suffered with huge losses. Credit Suisse estimates that the $50 billion of debt in the books of the major steel companies in India is around 15 times of their collective operating profit in fiscal year 2012.

Second, Government Influences on Public Sector Banks: The government holds considerable influence on all public banks. It appoints all the officials and boards of banks and in fact, the government itself is represented on their boards by senior officials of the Finance Ministry. Without the tacit agreement of the government, the large loans made out by these PSU banks couldn't have been possible. There are numerous examples of loans been advanced where they shouldn't have been: The case of Rajagopal even Kingfisher and Reliance.

Third: Asset-Liability from A Bank's Perspective - If a person/company/entity borrows a loan, for him that loan is a liability which needs to pay to the lender. On the other hand, if he deposits money in any account, that would be his asset. It is exact opposite from the bank's perspective. So, from a bank's point of view, all the savings account, current account and fixed deposits are liabilities. It is because bank is liable to pay interests on these deposits ranging from 0% to 10% in India, even higher in some cases. When Bank lends loan to any person or company, bank earns interest on that, anywhere into 4% to 40%. So, from a Bank's perspective, the loan it has lent is its assets and the deposit it carries is its liabilities. A Bank keeps money from individuals and companies, pays them interests, uses this money (which belongs to others) to give loans on an interest, higher than it pays. Basically, banks are paying interest for using that money. The difference between interest it earns from loans and the interest it pays to the depositors is called Interest Margin and is the primary source of Bank's income.

Within Indian Banks it is the public sector banks which are facing huge NPAs. Private sector banks like ICICI, HDFC, Axis etc too have NPAs but they are fairly negligible compared to public sector banks. Usually, the banks have a conservative credit policy which has many filters such as previous credit profile, if the loan seeker has defaulted in the past, his cash flow, i.e. if his future income is stable and reliable, if it is a secured loan, then if the property/asset on which loan is sought, has sufficient value so that bank can liquidate it if necessary and many such filters. But, despite this diligence, banks do have NPAs. However, the question is why have the public sector banks like UBI, BOI, SBI, and PNB along with 25 banks, having such high NPA? There are 2 groups of

defaulters who have majorly contributed to this. 1st group is big companies and corporate houses. Public Banks, possibly under political and economic pressure gave loans to a lot of companies who defaulted. The 2nd group is that of farmers. Since 2012, despite a lot of farm loan waiver schemes, the Agri sector has led to high NPAs. So, the high NPAs of these banks have got more to do with politics during the previous govt. regime than lack of diligence. A lot of this scam is being uncovered only now, even though the roots would have been planted way back in 2011-12.

Fourth: Restructuring Process - Restructuring is a process where an existing 'bad loan' is re-modified to make it more likely for the borrower to pay. For example, Bank may reduce the interest rate or it may ask the borrower to pay back only the interest or it may increase the period of repayment, say from 5 years to 10 years. So, the borrowers who was supposed to pay Rs 10,000 each month, needs to pay only Rs 5000 pm but for a longer period. This is a compromise between the borrower and lender to work on a mutually beneficial settlement. However the biggest point in restructuring is, the borrower must have an intention to pay and he must have means to pay as much as his willingness.

Fifth: Legal Measures - Indian law treats an individual and his company as 2 different entities. So, if company has borrowed loan and defaults, bank can seize properties of the company, but cannot seize property of individual. There are many companies which have defaulted but their promoters/owners have properties worth billions of dollars. In such cases, government should get ahead with such kind of laws and check if it is feasible to make the owners pay for the default. Or another option bank could do is that bank convert debt to equity and instead of acting as lenders, become the owners of these defaulting companies, appoint boards, govern these companies and bring them back to profit something like a private equity firm does.

Table - Net NPA as % to Net Advances of 17 Indian Banks

Net NPA as % to Net Advances				
Sector	**Bank**	**2010**	**2011**	**2012**
Public Sector banks	PNB	2.84	4.05	8.59
	BOI	2	2.36	7.79
	SBI	2.77	2.12	3.81
	UBI	2.33	2.71	5.25
	BOB	1.52	1.89	5.06
	Allahabad Bank	4.5	3.99	6.75
	Vijaya Bank	1.55	1.91	4.81
	IDBI	2.48	2.88	6.78
	CBI	3.75	3.61	7.36
	IOB	3.22	5.71	11.94
	OBC	2.81	3.67	6.67
Private Sector banks	ICICI	0.97	1.61	2.98
	HDFC	0.27	0.25	0.28
	AXIS	0.44	0.46	0.74
	YES	0.05	0.12	0.29
	Kotak Mahindra Bank	1.08	0.92	1.06
	Indusind Bank	0.33	0.31	0.36

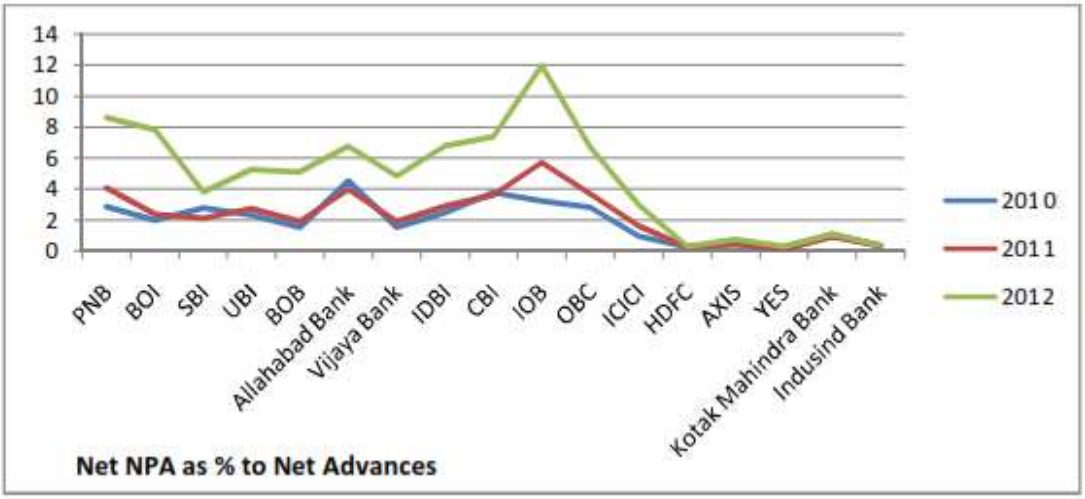

Figure: Net NPA as % to Net Advances of 17 Indian Banks

Gross bad loans at commercial banks could increase to 8.5 per cent of total advances from 7.6 per cent in March 2012, according to a baseline scenario projection by the Reserve Bank of India. The RBI has given a deadline of March 2012 for all banks to clean up their balance sheets, which also require these lenders to set aside huge chunk of capital in the form of provisions. Top ten public sector banks have written off Rs.40000 Crore alone in 2012 and recoveries of 24 public sector banks is less than one third of the annual write off. The recent case of 9000 cr rupee loss that caused by Vijya Mallya, Promoter of Kingfisher Airlines, to Indian Banking system has open the real defaulter list of large corporates which can cause harm to Indian Banking system. All 50's of our country's banks which has completed by March 2012 has opened the position of banks. Gross Bad debts in Indian banking System stood at 5.1% as of 30 September 2012, which is more the 3 times the bad debt ration of Chinese Banks (RBI Audit, 2012). RBI has continually warned the Indian banks about hidden bad loans on banks' book. The bad loan crisis that has gripped India's Rs 95 trillion banking sector and this didn't happen overnight.

From a technology standpoint, it really seems to make sense for banks to automate the entire process, from monitoring potential NPAs to submission of regulatory reports. Banks can create product specific early warning flags. For example, in case of a credit card holder, a sudden spike in total outstanding or a single large transaction can trigger a flagging. Banks can then work with the customer, understand if he/she is able to repay. If not, the customer can be offered flexible payments options and other facilities to ensure it doesn't change into a full blown NPA. Additionally, banks should also be in a position to analyze NPAs from multiple dimensions to understand the root cause for NPA origination. This is turn can provide crucial inputs to the credit policy, product design and sales processes of the bank. Needless to say, given the transaction volumes and diverse products, this will be possible only through smart use of technology. While the smart use of technology is automating NPA management and monitoring will not really ease the NPA burden for banks, it will be the crucial first step in ensuring banks is empowered to monitor and manage their existing loan book better. It will also over a period of time

provide valuable inputs to credit policy which could effectively enhance asset quality. As per Chairperson of SBI to improve NPA management, SBI will employ more tools than before, with emphasis on effective use of IT. IT is going to be used in risk mitigation, product pricing, customer-related issues and in raising productivity. The bank will also ramp up technology to tackle loan recovery. Focus will also be on structure rationalization and improved time resolution to fight bad loans.

Major types of Risks faced by Banks

Banking is the intermediation between financial savers on one hand and the funds seeking business entrepreneurs on the other hand. As such, in the process of providing financial services, banks assume various kinds of risk both financial and nonfinancial. Moreover, this risk inherent in the provision of their services differs from one product or service to the other. These risks have been grouped by various writers in different ways to develop the frameworks for their analyses but the common ones which are considered in this study are credit risk, market risks (which includes liquidity risk, interest rate risk and foreign exchange risk), operational risks (which sometimes include legal risk, and more recently, strategic risk) and reputational risk.

1. Credit Risk

Credit risk arises whenever a lender is exposed to loss from a borrower, counterparty, or an obligatory who fails to honour their debt obligation as they have contracted (Luy, 2010). According to Colquitt (2007), this loss may derive from deterioration in the counterparty ‘s credit quality, which consequently leads to a loss to the value of the debt, or according to Crouhy, et al., (2006), the borrower defaults when he is willingly to fulfill the obligations. The analysis of the financial soundness of borrowers has been at the core of banking activity since its inception. This analysis refers to what nowadays is known as credit risk, that is, the risk that counterparty fails to perform an obligation owed to its creditor. It is still a major concern for banks, but the scope of credit risk has been immensely enlarged with the growth of derivatives markets. Another definition considers credit risk as the cost of replacing cash flow when the counterpart defaults. In an article

by Elmer Kunke Kupper on Risk Management and Banking he defines credit risk as the potential financial loss resulting from the failure of customers to honour fully the terms of a loan or contract. This definition can be expanded to include the risk of loss in portfolio value as a result of migration from a higher risk grade to a lower one.

Greuning and Bratanovic (2009) define credit risk as the chance that a debtor or issuer of a financial instrument— whether an individual, a company, or a country— will not repay principal and other investment-related cash flows according to the terms specified in a credit agreement. Inherent to banking, credit risk means that payments may be delayed or not made at all, which can cause cash flow problems and affect a bank_s liquidity. The objective of credit risk management is to maximise a bank_s risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. More than 70 percent of a bank_s balance sheet generally relates to credit risk and hence considered as the principal cause of potential losses and bank failures. Time and again, lack of diversification of credit risk has been the primary culprit for bank failures. The dilemma is that banks have a comparative advantage in making loans to entities with whom they have an ongoing relationship, thereby creating excessive concentrations in geographic and industrial sectors. Credit risk includes both the risk that a obligor or counterparty fails to comply with their obligation to service debt (default risk) and the risk of a decline in the credit standing of the obligor or counterparty. While default triggers a total or partial loss of any amount lent to the obligor or counterparty, a deterioration of the credit standing leads to the increase of the possibility of default. In the market universe, a deterioration of credit standing of a borrower does materialise into a loss because it triggers an upward move of the required market yield to compensate the higher risk and triggers a value decline. Normally the financial condition of the borrower as well as the current value of any underlying collateral is of considerable interest to banks when evaluating the credit risks of obligors or counterparties.

According to Greuning and Bratanovic (2009), formal policies laid down by the board of directors of a bank and implemented by management plays a vital part in credit risk management. As a matter of fact, a bank uses a credit or lending policy to outline the scope and allocation of a bank's credit facilities and the manner in which a credit portfolio is managed— that is, how investment and financing assets are originated, appraised, supervised, and collected. There are also minimum standards set by regulators for managing credit risk. These cover the identification of existing and potential risks, the definition of policies that express the bank's risk management philosophy, and the setting of parameters within which credit risk will be controlled. There are typically three kinds of policies related to credit risk management. The first set aims to limit or reduce credit risk, which include policies on concentration and large exposures, diversification, lending to connected parties, and overexposure. The second set aims at classifying assets by mandating periodic evaluation of the collectability of the portfolio of credit instruments. The third set of policies aims to make provision for loss or make allowances at a level adequate to absorb anticipated loss.

2. Market Risks

Elmer Funke Kupper in his article on Risk Management and Banking defined Market Risk as the risk to earnings arising from changes in underlying economic factors such as interest rates or exchange rates, or from fluctuations in bond, equity or commodity prices. Banks are subject to market risk in both the management of their balance sheets and in their trading operations. Market risk is generally considered as the risk that the value of a portfolio, either an investment portfolio or a trading portfolio, will decrease due to the change in value of the market risk factors. There are three common market risk factors to banks and these are liquidity, interest rates and foreign exchange rates. Market Risk Management provides a comprehensive framework for measuring, monitoring and managing liquidity, interest rate, foreign exchange and equity as well as commodity price risk of a bank that needs to be closely integrated with the bank‘s business strategy. According to Santomero (1997), market risk by its nature can be hedged but cannot be diversified away completely. Two market risks that are of concern to the banking sector

are interest rates and relative value of currencies. The banking operation is solely dependent on these as it impacts on performance. For instance, most banks track interest rate risk closely. They measure and manage the firm‘s vulnerability to interest rate variation as well.

3. Liquidity Risk

Liquidity of bank may be defined as the ability to meet anticipated and contingent cash needs. Cash needs arise from withdrawal of deposits, liability maturities and loan disbursals. The requirement for cash is met by increases in deposits and borrowings, loan repayments, investment maturities and the sale of assets. Inadequate liquidity can lead to unexpected cash shortfalls that must be covered at inordinate cost which reduces profitability. It can lead to liquidity insolvency of the bank without being capital insolvent. According to Santomero (1997), liquidity risk can be described as the risk of a funding crisis, such as unexpected event in the form of large charge off, loss of confidence, or a crisis of national proportion like existence crisis. Risk management here centers on liquidity facilities and portfolio structure. Recognizing liquidity risk leads the banks to recognize liquidity itself as an asset, and portfolio design in the face of illiquidity concerns as a challenge. According to Greuning and Bratanovic (2009), a bank faces liquidity risk when it does not have the ability to efficiently accommodate the redemption of deposits and other liabilities and to cover funding increases in the loan and investment portfolio. These authors go further to propose that a bank has adequate liquidity potential when it can obtain needed funds (by increasing liabilities, securitising, or selling assets) promptly and at a reasonable cost. The Basel Committee on Bank Supervision, in its June 2008 consultative paper, defined liquidity as the ability of a bank to fund increases in assets and meet obligations as they become due, without incurring unacceptable losses. Bessis (2010) however considers liquidity risk from three distinct situations. The first angle is where the bank has difficulties in raising funds at a reasonable cost due to conditions relating to transaction volumes, level of interest rates and their fluctuations and the difficulties in funding a counterparty. The second angle looks at liquidity as a safety cushion which helps to gain time under difficult situations.

In this case, liquidity risk is defined as a situation where short-term asset values are not sufficient to match short term liabilities or unexpected outflows. The final angle from where liquidity risk is considered as the extreme situation. Such a situation can arise from instances of large losses which creates liquidity issues and doubts on the future of the bank. Such doubts can result in massive withdrawal of funds or closing of credit lines by other institutions which try to protect themselves against a possible default. Both can generate a brutal liquidity crisis which possibly ends in bankruptcy. There are many factors that affect banks own liquidity and in turn affect the amount of liquidity they can create. These factors have a varying degree of influence on the balance between liquidity risk and liquidity creation, or a bank‘s liquidity management.

A bank‘s assets and liabilities play a central role in their balancing of liquidity risk and creation. A bank‘s liabilities include all the banks sources of funds. Banks have three main sources of funds: deposit accounts, borrowed funds, and long-term funds. The amounts and sources of funds clearly affect how much liquidity risk a bank has and how much liquidity it can create. The easier a bank can access funds the less risk it has and the higher amount of funds it holds the more liquidity it can create. Liquidity is necessary for banks to compensate for expected and unexpected balance sheet fluctuations and to provide funds for growth (Greuning and Bratanovic, 2009). Santomero (1995) however, posits that while some would include the need to plan for growth and unexpected expansion of credit, the risk here should be seen more correctly as the potential for funding crisis. Such a situation would inevitably be associated with an unexpected event, such as a large charge off, loss of confidence, or a crisis of national proportion such as a currency crisis. Effective liquidity risk management therefore helps ensure a bank's ability to meet cash flow obligations, which are uncertain as they are affected by external events and other agents' behaviour. The Basel Committee on Bank Supervision consultative paper (June 2008) asserts that the fundamental role of banks in the maturity transformation of short-term deposits into long-term loans makes banks inherently vulnerable to liquidity risk, both of an institution-specific nature and that which affects markets as a whole. A liquidity shortfall at a single bank can have system-wide

repercussions and hence liquidity risk management is of paramount importance to both the regulators and the industry players. The price of liquidity is conversely a function of market conditions and the market_s perception of the inherent riskness of the borrowing institution (Greuning and Bratanovic, 2009). So, if there is a national crisis such as acute currency shortage or decline, or perception of the bank's credit standings deteriorates, or fundraising by the bank becomes suddenly important and recurrent or has unexpected fluctuation, funding becomes more costly. Financial market developments in the past decade have increased the complexity of liquidity risk and its management.

4. Interest Rate Risk

All financial institutions face interest rate risk. Changes in interest rates affect both bank's earning and expenses and also the economic value of its assets and liabilities. The effects resulting from these changes are reflected in the bank's capital and income. Bank regulators and supervisors place great emphasis on the evaluation of bank interest rate risk management. These have begun to grow in importance since the implementation of market-risk-based capital charges recommended by the Basel Committee. Interest rate risk management comprises various policies, actions, and techniques that banks use to reduce the risk of reduction of its net equity as a result of adverse changes in interest rates.

In general, interest rate risk is the potential for changes in interest rates to reduce a bank's earnings or value. Most of the loans and receivables of the balance sheet of banks and term or saving deposits, generate revenues and costs that are driven by interest rates and since interest rates are unstable, so are such earnings. Though interest rate risk is obvious for borrowers and lenders with variable rates, those engaged in fixed rate transactions are not exempt from interest rate risks because of the opportunity cost that arises from market movements (Bessis, 2010). According to Greuning and Bratanovic (2009), the combination of a volatile interest rate environment, deregulation, and a growing array of on and off-balance-sheet products have made the management of interest rate risk a growing challenge. At the same time, informed use of interest rate derivatives— such as

financial futures and interest rate swaps— can help banks manage and reduce the interest rate exposure that is inherent in their business. Bank regulators and supervisors therefore place great emphasis on the evaluation of bank interest rate risk management, particularly since the Basel Committee recommends the implementation of market risk– based capital charges. Greuning and Bratanovic (2009) posits that banks encounter interest rate risk from four main sources namely reprising risk, yield curve risk, basis risk, and optionality. The primary and most often discussed source of interest rate risk stems from timing differences in the maturity of fixed rates and the reprising of the floating rates of bank assets, liabilities, and off-balance sheet positions. The basic tool used for measuring reprising risk is duration, which assumes a parallel shift in the yield curve. Also, reprising mismatches expose a bank to risk deriving from changes in the slope and shape of the yield curve (nonparallel shifts). Yield curve risk materialises when yield curve shifts adversely affect a bank's income or underlying economic value. Another important source of interest rate risk is basis risk, which arises from imperfect correlation in the adjustment of the rates earned and paid on different instruments with otherwise similar repricing characteristics. When interest rates change, these differences can give rise to unexpected changes in the cash flows and earnings spread among assets, liabilities, and off-balance-sheet instruments of similar maturities or reprising frequencies.

An increasingly important source of interest rate risk stems from the options embedded in many bank asset, liability, and off-balance-sheet portfolios. If not adequately managed, options can pose significant risk to a banking institution because the options held by customers, both explicit and embedded, are generally exercised at the advantage of the holder and to the disadvantage of the bank. Moreover, an increasing array of options can involve significant leverage, which can magnify the influences (both negative and positive) of option positions on the financial condition of a bank. Broadly speaking, interest rate risk management comprises various policies, actions and techniques that a bank uses to reduce the risk of diminution of its net equity as a result of adverse changes in interest rates from any of the sources mentioned above. Risk factors related to interest rate risk are estimated in each currency in which a bank has interest-rate-sensitive on and

off-balance sheet positions. Since interest rate risk can have adverse effects on both a bank's earning and its economic value, an approach which focuses on the impact of interest rate changes on a bank's net interest income is combined with another which takes a more comprehensive view of the potential long-term effects of such interest rates changes on its economic value is used to assess the interest risk exposure.

5. Foreign Exchange Risk

This is the risk incurred when there is an unexpected change in exchange rate altering the amount of home currency need to repay a debt denominated in foreign currency. Bessis (2010), defines foreign exchange risk as incurring losses due to changes in exchange rates. Such loss of earnings may occur due to a mismatch between the value of assets and that of capital and liabilities denominated in foreign currencies or a mismatch between foreign receivables and foreign payables that are expressed in domestic currency. According to Greuning and Bratanovic (2009), foreign exchange risk is speculative and can therefore result in a gain or a loss, depending on the direction of exchange rate shifts and whether a bank is net long or net short (surplus or deficit) in the foreign currency. In principle, the fluctuations in the value of domestic currency that create currency risk result from long-term macroeconomic factors such as changes in foreign and domestic interest rates and the volume and direction of a country's trade and capital flows. Short-term factors, such as expected or unexpected political events, changed expectations on the part of market participants, or speculation-based currency trading may also give rise to foreign exchange changes. All these factors can affect the supply and demand for a currency and therefore the day-to-day movements of the exchange rate in currency markets. Foreign exchange risk is generally considered to comprise of transaction risk, economic risk and revaluation risk. Transaction risk is the price-based impact of exchange rate changes on foreign receivables and foreign payables, that is, the difference in price at which they are collected or paid and the price at which they are recognized in local currency in the financial statements of a bank or corporate entity. Alternatively known as business risk, economic risk relates to the impact of exchange rate changes on a country's long-term or a company's competitive position.

With increasing globalization, capital moves quickly to take advantage of changes in exchange rates and therefore devaluations of foreign currencies can lead to increased competition in both overseas and domestic markets. This phenomenon makes this component of foreign exchange risk very critical for its management. The third component, revaluation or translation risk arises when a bank's foreign currency positions are revalued in domestic currency, and when a parent institution conducts financial reporting or periodic consolidation of financial statements. Banks conducting foreign exchange operations are also exposed to foreign exchange risk in forms of credit risks such as the default of the counterparty to a foreign exchange contract and time-zone-related settlement risk.

6. Operational Risks

The Basel Accord (2007), defines operational risk as the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems or from external events. Malfunctions of the information systems, reporting systems, internal monitoring rules and internal procedures designed to take timely corrective actions, or the compliance with the internal risk policy rules result in operational risks (Bessis, 2010). Operational risks, therefore, appear at different levels, such as human errors, processes, and technical and information technology. Because operational risk is an ―event risk, in the absence of an efficient tracking and reporting of risks, some important risks will be ignored, there will be no trigger for corrective action and this can result in disastrous consequences. Developments in modern banking environment, such as increased reliance on sophisticated technology, expanding retail operations, growing e-commerce, outsourcing of functions and activities, and greater use of structured finance (derivative) techniques that claim to reduce credit and market risk have contributed to higher levels of operational risk in banks (Greuning and Bratanovic, 2009).

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The recognition of the above-mentioned contributory factor in operational risk has led to an increased attention on the development of sound operational risk management systems by banks with the initiative being taken by the Basel Committee on Banking Supervision. The Committee addressed operational risk in its Core Principles for Effective Banking Supervision (1997) by requiring supervisors to ensure that banks have risk management policies and processes to identify, assess, monitor, and control or mitigate operational risk. In its 2003 document, Sound Practices for the Management and Supervision of Operational Risk, the Committee further provided guidance to banks for managing operational risk, in anticipation of the implementation of the Basel II Accord, which requires a capital allocation for operational risks. Despite all these efforts by the regulators at addressing operational risk, practical challenges exist when it comes to its management. In the first place, it is difficult to establish universally applicable causes or risk factors which can be used to develop standard tools and systems of its management since the events are largely internal to individual banks. Moreover, the magnitude of potential losses from specific risk factors is often not easy to project. Lastly, it is difficult designing an effective mechanism for systematic reporting of trends in a bank_s operational risk because very large operational losses are rare or isolated. Because of the data and methodological challenges raised by operational risk, the first stage of developing an effective framework to manage it is to set up a common classification of loss events that should serve as a receptacle for data gathering process on event frequency and costs. The data gathered is then analysed (risk mapping) with various statistical techniques such as graphical representation of the probability and severity of risks. This helps to find the links between various operational risks. The process then ends with some estimates of worst-case losses due to events risks. Modelling of loss distributions due to operational risks will enable the right capital charges to be made for operational risk as required by current regulations (Bessis, 2010). In order for the objectives of setting up an operational risk management framework to be accomplished, it may require a change in the behaviour and culture of the firm. Management must also not only ensure compliance with the operational risk policies established by the board, but also report

regularly to senior executives. A certain amount of self-assessment of the controls in place to manage and mitigate operational risk will be helpful.

7. Strategic Risks

While financial risk and credit risk in banking have been rigorously explored, the risk management implications of many corporate strategies and the external market and industry uncertainties have received relatively little attention (Miller, 1992). Slywotzky and Drzik (2005), define strategic risk as the array of external events and trends that can devastate a company_s growth trajectory and shareholder value. Whiles these two authors consider strategic risk as a sole consequence of external occurrences, other authors look at strategic risk as the current and prospective impact on earnings and/or capital arising from internal business activities such as adverse business decisions, improper implementation of decisions, or lack of responsiveness to industry changes. They therefore consider strategic risk as a function of the compatibility of an organisation's strategic goals, the business strategies developed to achieve those goals, the resources deployed against these goals, and the quality of implementation. Emblemsvåg and Kjølstad (2002), also define strategic risk as risk which arises as a firm pursues its business objectives either by exploiting opportunities and/or reducing threats. Whichever way this is considered, strategic risk encompasses a variety of uncertainties which are not financial in nature, but rather credit or operational related caused by macro-economic factors, industry trends or lapses in a firm's strategic choices which affects the firm's earnings and shareholders_ value adversely. Strategic risks often constitute some of a firm's biggest exposures and therefore can be a more serious cause of value destruction. Unfortunately, as strategic risks are often highly unpredictable and of different forms, managers have also not yet been able to systematically develop tools and techniques to address them (Slywotzky and Drzik, 2005). This is because the more formalized risk management approaches often remain focused on identifiable exposures and thus less suitable to deal with many of the unexpected economic and strategic events that characterize contemporary business environment in which strategic risks are embedded.

Slywotzky and Drzik (2005) attempted to identify significant events which contribute to strategic risk and categorized them into seven main classes. These include industry margin squeeze, threat of technology shift which has the possibility of driving some products and services out of the market, brand erosion, emergence of one-of-a-kind competitor to seize the lion share of value in the market, customer priority shift, and new project failure and market stagnation. The idea was to provide a framework for assessing a company's strategic risks and develop counter measures to address them. The authors intimate that the key to surviving strategic risks is; knowing how to assess and respond to them and therefore devoting resources to it. They also advice management to adjust their capital allocation decisions by applying a higher cost of capital to riskier projects and to build greater flexibility into their capital structure when faced with riskier competitive environments. How these risks can be managed is determined by the organisational characteristics – the strengths and weaknesses. They include communication channels, operating systems, delivery networks, and managerial capacities and capabilities. The organisations internal characteristics must be evaluated against the impact of economic, technological, competitive, regulatory, and other environmental changes. An effective strategic risk management approach should embrace both the upside and downside of risk. It should seek to counter all losses, both from accidents and from unfortunate business judgments, and seize opportunities for gains through organisational innovation and growth. Seizing upside risk involves searching for opportunities and developing plans to act on these opportunities when the future presents them. Countering downside risk on the other hand is done by reducing the possibility of occurring (probability) and scope (magnitude) of losses; and financing recovery from these losses (Herman and Head, 2002). Beasley and Frigo (2007) posit that the first step in strategic risk management is finding a way to systematically evaluate a company's strategic business risk. Thus, strategic risk management begins by identifying and evaluating how a wide range of possible events and scenarios will impact a business's strategy execution, including the ultimate impact on the valuation of the company.

Before management can effectively manage risks that might be identified by various scenario analyses, they need to define an overriding risk management goal. Stephen Gates (2006) argues that due to the complexity of the concept of strategic risk, no single quantitative measure will prove satisfactory in all strategic situations. Because of the distinctiveness of the set of strategic risk faced by every/each financial institution, regulators have not been able to develop general guidelines for all the institutions for managing strategic risk. Some consultants and scholars have come out with some recommendations and guidelines for managing strategic risk. One such guide is by Slywotzky and Drzik (2005). Building a thorough strategic risk management framework requires an institution to revise both its internal practices and its external environment, and to understand how closely the two are connected.

8. Reputation Risk

Reputation is often referred to as ―Emotional Capital/ Equity‖ of a firm and as capital, it is subjected to risk. According to Atkins, Drennan and Bates (2006) a significant part of many successful companies share price is not made up of tangible asset such as property and reserves but from the goodwill element. Hence, a company‘s reputation includes various intangibles such as the potential future profit stream and the value of its brand. These intangibles may be several times the value of tangible assets in companies with good reputation. Conversely a company with a poor reputation can have negative reputation equity where the company is valued at less than the value of its tangible assets. In a paper by the Economist Intelligent Unit (EIU) 2005 reputation risk is seen as becoming one of the emerging and increasingly important class of risk on the priority list of most managers. With an index score of 52, reputational risk is perceived as substantially more significant than regulatory, human Capital, IT, market and credit risks. The Basel II committee on banking supervision: Reputational risk and implicit support defined Reputational risk as the current or prospective risk to earnings and capital arising from adverse perception of the image of the financial institution on the part of customers, counterparties, shareholders, investors or regulators that can adversely affect a bank‘s ability to maintain existing or establish new, business relationship and continued access

to sources of funding (e.g. through the interbank or securitisation markets). However, some prominent authorities acknowledge that it also one of the most difficult assets to protect. As cited by Warren Buffet and Goldman Sachs Business Principles. ―It takes twenty years to build a reputation and five minutes to destroy it. ‖ ―If you lose dollars I will understand. If you lose reputation, I will be ruthless ‖ (Warren Buffet). ―Our assets are our people, capital and reputation. If any of these are ever diminished, the last is the most difficult to restore. ‖ (Goldman Sachs). These buttress the point that though cash, stocks and asset such as buildings are the most valuable assets of a bank and the shortage of these could send its customers to its competitors, it is trust that most frequently deals the final blow.

Categories of Credit Risk

Banking system in India is one of the most important ingredients in the Indian financial market. Banks are the biggest purveyors of credit, and they also attract most of the savings from the population. Banking industry, dominated by public sector banks, has so far acted as an efficient partner in the growth and development of the Indian economy. Driven by the socialist ideologists and the welfare state concept, public sector banks have long been the supporters of agriculture and other priority sectors. The Indian banking has come from a long way from being a sleepy business institution to a highly proactive and dynamic entity. This transformation has been largely brought about by the large dose of liberalization and economic reforms that allowed banks to explore new business opportunities rather than generating revenues from conventional streams (i.e. borrowing and lending). The world of banking has assumed a new dimension at the dawn of the 21st century with the advent of tech banking, thereby lending the industry a stamp of universality. In general, banking may be classified as retail and corporate banking. Retail banking, which is designed to meet the requirements of individual customers and encourage their savings, includes payment of utility bills, consumer loans, credit cards, checking account balances, ATMs, transferring funds between accounts and the like. Corporate banking, on the other hand, caters to the needs of corporate customers like bills discounting, opening letters of credit and managing cash.

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Commercial Banking mainly has two functions, which are Accepting deposits and Granting credit. Out of these two, it is the latter which is a revenue generation activity for the bank. So, it is imperative that banks carry out this function with utmost efficiency and due diligence. It is, therefore, vital that the banks have adequate systems for credit assessment of individual projects and for evaluating risk associated therewith as well as the industry as a whole. Generally, Banks in India evaluate a proposal through the traditional tools of project financing, computing maximum permissible limits, assessing management capabilities and prescribing a ceiling for an industry exposure. As banks move in to a new high-powered world of financial operations and trading, with new risks, the need is felt for more sophisticated and versatile instruments for risk assessment, monitoring and controlling risk exposures. Credit risk exists because an expected payment might not occur. Credit risk can be defined as potential losses from the refusal or instability credit customer to pay what is owed in full and on time. Trade credit involves a supplier providing a buyer with goods or services for which payment is deferred. Bank lending involves a bank providing a loan in return for the promise of interest and capital repayment in the future.

Bankers are concerned with six main types of risk. These are credit risk, liquidity risk, market risk, interest rate risk, earnings risk and solvency risk that can be grouped as credit risk, market risk and operational risk. Furthermore, currency risk, country risk and cross-border risk should be considered when international lending is the subject matter. Among these risks credit risk plays the major role since by far the largest asset item is loans, which generally account for half to almost three-quarters of the total value of all bank assets. The probability that some of a bank‘s assets, especially its loans, will decline in value and perhaps become worthless is known as credit risk. Genrally, credit risk is associated with the traditional lending activity of banks and it is simply described as the risk of a loan not being repaid partly or in full. However, credit risk can also derive from holding bonds and other securities. According to the Basel (1999a), credit risk is defined as ―the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed term‖. And the Monetary Authority of Singapore (2006), has

defined it to be the ―risk arising from the uncertainty of an obligor‘s ability to perform its contractual obligations‖, where the term ―obligor‖ refers to any party that has either direct or indirect obligations under the contract.

Credit risk arises from uncertainty in counterparty‘s ability or willingness to meet its pre-committed contractual obligations. It arises from nonperformance by a borrower. This can affect the lender holding the loan contract, as well as other lenders to the creditor. Therefore, the financial condition of the borrower as well as the current value of any underlying collateral is of considerable interest to its bank. Collateral is a form of security to a lender in case the borrower fails to repay a loan. It plays an important role in the financial sector, as it is a means of covering potential losses. Credit risk presents the inability of the credit user to pay back the granted loan along with the corresponding provision within the maturity date. This inability to pay back the loan and the provision presents a loss for the bank involved. In order to prevent this loss, it is necessary for banks to minimize potential credit risk before granting a loan. However, in theory, credit risk is seen as a more comprehensive term, and it is stated that credit risks occur in three cases:

- Firstly, if a debtor does not pay back the loan within at least three months after the maturity date set by the credit contract.

- Secondly, if a debtor breaks one of the security clauses in a credit contract. In that case, the negotiation process between the debtor and the bank is initiated automatically; otherwise, the debtor is required to pay the total amount loan back immediately.

- Thirdly, economic risk occurs in the cases when the economic (market) value of debtor‘s assets decreases below the value of the debt. At the same time, economic value of the debt presents the value of the expected future financial flows (cash flow), discounted to the present moment, through a suitable discount rate. Namely, if the market value of the debtor‘s assets drops below the market value of bonds, it means that the current expectations of the future financial flows are such that the loan cannot be paid

back. However, in this third case, the creditor (i.e. the bank) does not exercise the right to start a legal procedure against the debtor.

To gain a better understanding on the nature of credit risk, it is necessary to introduce the types of credit risk involved in financial activities before any further discussion. Concerning the categorizing of credit risk, different authors have expressed various criteria. For example, Hennie (2003) points out in his book that the three main types of credit risk are consumer risk, corporate risk and sovereign or country risk, while Culp and Neves (1998) consider realized default risk and resale risk to be the two types of credit risk. What is adopted here is part of the views from who defines six types of credit risk, including default risk, counterparty pre-settlement risk, counterparty settlement risk, legal risk, country or sovereign risk and concentration risk. However, since legal risk is more likely to be considered as independent or belonging to operational risk nowadays and concentration risk, together with adverse selection as well as moral hazard, is more reasonably to be thought of as an important issue in managing credit risk rather than a type of the risk itself, in the following illustration, only the rest four kinds of credit risk mentioned by Horcher (2005) will be touched upon.

1. Default Risk

According to Horcher (2005), traditional credit risk relates to the default on a payment, especially lending or sales. And a likelihood of the default is called the probability of default. When a default occurs, the amount at risk may be as much as the whole liability, which can be recovered later, depending on factors like the creditors‘ legal status. However, later collections are generally difficult or even impossible in that huge outstanding obligations or losses are usually the reasons why organizations fail.

2. Counterparty Pre-Settlement

Risk Pre-settlement risk arises from the possibility that the counterparty will default once a contract has been entered into but a settlement still does not occur. During this period, a contract has unrealized gains, which indicates the risk. The potential loss to the organization depends on how market rates have changed since the establishment of the

original contract, which can be evaluated in terms of current and potential exposure to the organization.

3. Counterparty Settlement Risk

According to Casu, Girardone and Molyneux (2006), settlement risk is a risk typically faced in the interbank market and it refers to the situation where one party to a contract fails to pay money or deliver assets to another party at the settlement time, which can be associated with any timing differences in settlement. Horcher (2005) points out that the risk is often related with foreign exchange trading, where ―payments in different money centers are not made simultaneously and volumes are huge‖. The case of the small German bank Bankhaus Herstatt, which received payments from its foreign exchange counterparties but had yet to make payments to counterparty financial institutions on the shutting down date, can serve as a typical example for the failure caused by settlement risk.

4. Country or Sovereign Risk

Country risk arises due to the impact of deteriorating foreign economic, social and political conditions on overseas transactions and sovereign risk refers to the possibility that governments may enforce their authority to declare debt to external lenders void or modify the movements of profits, interest and capital under some economic or political pressure. Then as Horcher (2005) has concluded, since evidence shows that countries and governments have temporarily or permanently imposed controls on capital, prevented cross-border payments and suspended debt repayments etc., problems arise for issuers to fulfill obligations in such environment. Also, financial crisis may precipitate sometimes.

Credit Risk Management in Banking

Commercial Banks (CBs) are profit-making organizations acting as intermediaries between borrowers and lenders attracting temporarily available resources from business and individual customers as well as granting loans for those in need of financial support. Commercial banks are in the business of mobilizing deposits, lending money, investing

funds and holding bonds and other securities. Performance of a commercial bank depends on balancing its striving for profit at the same time ensuring its liquidity with the least risk. The traditional role of a CB is lending and make up the bulk of its assets. Loans dominate asset holding and generate the largest share of operating income. Banks raise funds by collecting deposits from businesses and individual depositors and makes out loans to individuals, businesses and the government through buying bonds. Thus, the primary assets of banks are loans and bonds while primary liabilities are made of deposits. A banks' balance sheet has loans representing the majority of a bank's assets, but the loans come with risk. If the bank makes bad loans to firms or consumers for example, the bank will be in a crisis if those loans are not repaid. Bank loan is a debt, which entails the redistribution of the financial assets between the lender and the borrower. The bank loan is commonly referred to the borrower who got an amount of money from the lender, and need to pay back, known as the principal. In addition, the banks normally charge a fee from the borrower, which is the interest on the debt. In unstable economic environments interest rates charged by banks are fast overtaken by inflation and borrowers find it difficult to repay loans as real incomes fall, insider loans increase and over concentration in certain portfolios increases giving a rise to credit risk.

Credit risk is a major concern for lenders worldwide as it is the most critical of all risks faced by a banking institution. The magnitude and the level of loss caused by credit risk compared to others are severe to cause bank failures. The more banks know about the creditworthiness of a potential borrower, the greater the chance they can maximize profits, increase market share, minimize risk, and reduce the financial provision that must be made for bad debt. The main challenge to CBs in their operations is the disbursement of loans and advances. There is need for CBs to adopt appropriate credit appraisal techniques to minimize the possibility of loan defaults since defaults on loan repayments leads to adverse effects such as the depositors losing their money, loss of confidence in the banking system, and financial instability.

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Although the effects of all risk's types can cause negative consequences to the bank, credit risk has been pinpointed or identified as the key risk associated with negative consequences in terms of its influences on bank performance. This means if credit risk is not well managed, it can lead to failure. Thus, for any bank to succeed, its CRM must be handled with a lot of seriousness. This is because should a loss occur, the bank will have to ―extend its hands‖ to get funds from other means to meet up or cover the losses. A clear reason why a correct management of credit risk is very important is because banks have a limited capacity to absorb loan losses and this loses can be covered only by using income generated by other profitable loans or by bank capital. If the income is used from these two sources to meet up for a loan that has not been paid, this action will go a long way to affect the capital adequacy of the bank, its liquidity and even its profitability. Looking at the consequences or effects of credit risk, it is important that before a bank gives out a loan, it should try as much as possible to have a concrete view of the borrower. says ―Because of the potentially dire effects of credit risk, it is important to perform a comprehensive evaluation of a bank's capacity to assess, administer, supervise, enforce and recover loans, advances, guarantees, and other credit instruments‖. The bank has to possess its capability of how to recover a loan from a customer while reviewing its credit risk management policies and practices as outlined by the board. This means that the credit risk management process has to be followed in order to ensure that granted loans can be recovered in time and if not, a good collateral can be got in replacement of the loan. Each bank obviously has to develop its own strategies so as to fight competitors in the same industry by being successful. The bank has to assess the credit worthiness of the borrower and even after the loan is granted, interim monitoring is required until when the borrower has finished repaying the loan. This monitoring is very important because with the uncertainty in the future, any potential event that can cause a borrower to default payment can be fast identified or, a mechanism can be put in place on time to reduce the frequency and /or intensity of a loss should it occur. Early identification of borrowers at risk is good because it enables servicers to adequately staff collections departments, determine the most cost-effective type of customer outreach, and initiate repayment plans

before a borrower‘s financial situation worsens to the point at which foreclosure is unavoidable.

Credit risk emanates from a bank‘s dealing with individuals, corporate, financial institutions or a sovereign. The bank is exposed to credit risk through its trading, lending and investing activities and in cases where it acts as an intermediary on behalf of customers or other third parties or it issues guarantees. According to Basel Committee on Banking Supervision, credit risk is defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms. Credit risk arises from uncertainty in counterparty‘s ability or willingness to meet its pre-committed contractual obligations. It arises from non-performance by a borrower. This can affect the lender holding the loan contract, as well as other lenders to the creditor. Therefore, the financial condition of the borrower as well as the current value of any underlying collateral is of considerable interest to its bank. Collateral is a form of security to a lender in case the borrower fails to repay a loan. It plays an important role in the financial sector, as it is a means of covering potential losses. Credit risk is the risk of loss caused by a debtor defaulting on a loan or line of credit. In a bank‘s portfolio, losses stem from outright default due to inability or unwillingness by customer or counter party to meet commitments in relation to lending, trading, settlement and other financial transactions. Alternatively, losses may result from reduction in portfolio value due to actual or perceived deterioration in credit quality. The real risk from credit is the deviation of portfolio performance from its expected value. Commercial banks and other financial institutions form opinions about a company‘s credit risk by comparing current and future debt-service requirements to estimate of the company‘s current and expected future cash flows. Counterparty may default because of bankruptcy or temporary financial problems. Risk plays an important role in debt contracting. At loan inception, the lender estimates the expected credit risk that the borrower presents over the life of the loan. Absent provisions to control increases in credit risk, the lender prices the expected outcome in the interest rate of the loan. Both lender and borrower suffer when the expected credit risk of the borrower is high; the lender with increased risk over the life of the loan, and

the borrower with a high interest rate. This suggests that both contracting parties benefit when provisions are included in the debt contract to control increases in credit risk.

Funso and et al., (2012) investigates the quantitative effect of credit risk on the performance of commercial banks in Nigeria for the period 2000-2010. Profit was measured by Return on Asset, as a function of the ratio of non-performing loan to loan & advances, ratio of total loan & advances to total deposit and the ratio of loan loss provision to classified loans as measures of credit risk. Panel model analysis was used to estimate the determinants of the profit function. The results showed that the effect of credit risk on bank performance measured by the return on assets of banks is cross-sectional invariant. Alam and Masukujjaman (2011), their study is about risk management practices of commercial banks in Bangladesh, this study examine types of risk facing a bank, procedure and techniques used to minimize the risk. The study reveals that credit risk, market risk and operational risk are the major risks to the bankers which are managed through three layers of management system. The Board of Directors performs the responsibility of the main risk oversight, the Executive Committee monitors risk and the Audit Committee oversees all the activities of banking operations. It is found that internal rating system and risk adjusted rate of return on capital are relatively more important techniques used by banks. Kargi (2011) evaluate the impact of credit risk on the profitability of Nigerian banks. The findings revealed that credit risk management has a significant impact on the profitability of Nigerian banks. It concluded that banks profitability is inversely influenced by the levels of loans and advances, non-performing loans and deposits thereby exposing them to great risk of illiquidity and distress. Said and Tumin (2011) investigates the impact of bank-specific factors which include the liquidity, credit, capital, operating expenses and the size of commercial banks on their performance, which is measured by return on average assets (ROAA) and return on average equity (ROAE). The results imply that ratios employed in this study have different effects on the performance of banks in Malaysia and China, except credit and capital ratios. Operating ratios influence performance of banks in China, but this influence is not true for Malaysian banks regardless of the measure of performance.

Kithinji (2010), assess the effect of credit risk management on the profitability of commercial banks in Kenya, the study found that the level of credit was high in the early years of the implementation of Basle II but decreased significantly in 2007 and 2008, probably when the Basle II was implemented by commercial banks. The findings reveal that the bulk of the profits of CBs are not influenced by the amount of credit and non-performing loans suggesting that other variables other than credit and non-performing loans impact on profits. Felix and Claudine (2008) investigate the relationship between bank performance and credit risk management. They found that return on equity and return on assets both measuring profitability were inversely related to the ratio of non-performing loan to total loan of financial institutions thereby leading to a decline in profitability. Richard, et al. (2008) develops a conceptual model to be used further in understanding credit risk management (CRM) system of commercial banks (CBs) in an economy with less developed financial sector. They found that the components of CRM system differ in CBs operating in a less developed economy from those in a developed economy. This implies that the environment within which the bank operates is an important consideration for a CRM system to be successful. Hosna, et al. (2009), describes the impact level of credit risk management on profitability in four commercial banks in Sweden. The study is limited to identifying the relationship of credit risk management and profitability of four commercial banks in Sweden. The findings and analysis reveal that credit risk management has effect on profitability in all 4 banks. Muninarayanappa and Nirmala (2004) outlined the concept of credit risk management in banks. They highlighted the objectives and factors that determine the direction of bank‘s policies on credit risk management. The challenges related to internal and external factors in credit risk management are also highlighted. They concluded that success of credit risk management requires maintenance of proper credit risk environment, credit strategy and policies. Thus, the ultimate aim should be to protect and improve the loan quality. Bagchi (2003), examine credit risk management in banks. He examined risk identification, risk measurement, risk monitoring, risk control and risk audit as basic considerations for credit risk management. The author concluded that proper credit risk architecture, policies and framework of credit risk management, credit rating system, monitoring and

control contributes in success of credit risk management system. A study by Salas and Saurina (2002) on Spanish commercial and saving banks, revealed that growth in GDP, rapid credit expansion, bank size and capital ratio influenced the non-performing loans.

Hennie (2003), states that despite innovations in the financial services sector over the years, credit risk is still the major single cause of bank failures, for the reason that ―more than 80 percent of a bank‘s balance sheet generally relates to this aspect of risk management‖. The consultative paper issued by Basel (1999a) also points out that the major cause of serious banking problems continues to be directly due to the loose credit standards for borrowers and counterparties, poor portfolio risk management and so on. All such evidence proves the extremely vital role credit risk management plays in the whole banking risk management approach as well as the sustainable success of the organization. In this section, the goal and principles of banking credit risk management will be summarized briefly, which together with the above part on the identification of the existing credit risk in banking activities, will provide a basic framework for the understanding and discussion of banks‘ credit risk management practices.

CHAPTER - 4

YES BANK: A CASE STUDY

YES BANK – AN INTRODUCTION

Introduction

Yes Bank, India's new age private sector Bank, is an outcome of the professional commitment of its Founder Rana Kapoor and his highly competent top management team, to establish a high quality, customer centric, service driven, private Indian Bank catering to "Emerging India". Yes Bank is the only Green field license awarded by the RBI in the last 12 years, associated with the finest pedigree investors. Yes Bank has adopted international best practices, the highest standards of service quality and operational excellence and offers comprehensive banking and financial solutions to all its valued customers. A key strength and differentiating feature of Yes Bank is its knowledge driven approach to banking and an unprecedented customer experience for its retail banking and wealth management clients. Yes Bank is built on a foundation of trust, strengthened by knowledge, backed by cutting-edge technology governed by transparency and committed to responsible banking. The result is an unstinted commitment to growing your wealth. It is this commitment that has earned us the distinction of being ranked India's No.3 Bank in a recent survey of listed banks in India by Business world. The same survey also ranked Yes Bank No.3 Bank in a recent survey of listed banks in India, by Business world. The same survey also ranked Yes Bank No.1 in Safety, Efficiency & Growth. Yes Bank was recently ranked No.2 amongst New Private Sector Banks, in the Financial Express survey of India's Best Banks for 2006 while being ranked No.1 in Growth. Today, Yes Bank is present across all major cities in India and offers a comprehensive range of banking products and financial services which include corporate and institutional banking, financial markets, investment banking, business and transactional banking, retail and private banking business lines across the

country. The Bank's constant endeavor is to provide a delightful banking experience expressed with simplicity, empathy and totality.

Yes Bank is an outcome of the professional entrepreneurship of its Indian promoters, Rana Kapoor and Ashok Kapur, two highly experienced bankers, who have held leadership positions in some of the world's prominent banks in India. In addition, the two promoters have a proven track record as professional entrepreneurs in successful establishing and managing Rabo India Finance Private Limited, a joint venture with Rabo bank, Netherlands. Yes Bank is the only green field license awarded by the RBI in last 10 years. The two Indian promoters jointly hold 38.62% of the Bank.

In recognition of the promoters proven track record, Rabo Bank, Netherlands financially participated with a pre-IPO 20% stake in Yes Bank. Rabo Bank has consolidated assets in excess of Euro 440 billion and is rated 'AAA' by S&P and Moodys. As at March 31, 2006 Rabo bank holds 19.80% shares of the Bank.18.52% of the bank is owned by three pedigree private equity investors viz. Citicorp Venture Capital, Chrys Capital and AIF Capital. Certain senior management personnel of the Bank hold 2.13% of the paid-up capital.

The Bank completed its maiden IPO of 70 million shares raising INR 3,150 million of capital at a price of INR45 per share. The additional shares offered represent 25.93% of the Bank's paid – up capital, which currently stands at INR 2,700 million. The total net worth of the Bank as at March 31,2006, is INR5,668.59 million.

Unique Technology Model:

As a new generation bank, YES BANK has the advantage of accessing the latest available technology. The Bank has outsourced a significant part of its technology, infrastructure and hardware requirements, which is believed to give the Bank an advantage over other banks using traditional legacy systems and in-house processing. Gartner advised the Bank in adopting global best practice in its IT strategy and technology road map. Yes Bank was awarded IT innovations in Emerging India by NASSCOM in April'06. The award was in recognition of the Bank's adoption of

innovative technologies for increased customer satisfaction and for improving process efficiencies.

Corporate Governance:

Even at a nascent stage, Yes Bank has fully complied with the recommendations of Ganguly Committee, the Banking Regulation Act as well as the Clause 49 requirements of the stock exchanges in the formation of its Board of Directors and other governance requirements.

Brand Creation:

The Bank believes that its differentiation begins with its service and trust mark 'YES'.'YES' represents the Bank's true spirit of being service-oriented. The 'YES' brand creation effort is supported by Triton Communications', the principal advertising agency and 'Alok Nanda &Co., the Bank's design consultant.

Institutionalized Processes:

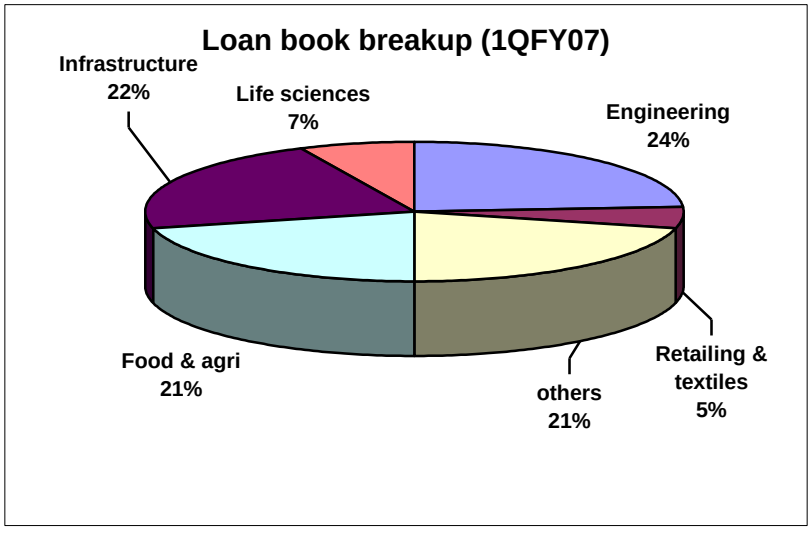
The Bank has focused on prudent documentation of policies and procedures to ensure consistent service delivery in all its offerings. Price water house Coopers has advised the Bank in finalizing and standardizing its policy and procedure documents.

Business Strategy:

Knowledge Banking:

One of the strengths and differentiating features of YES BANK is its Knowledge Banking approach that is the essence of all offerings to its customers. Knowledge has been institutionalized as a key ingredient in all internal and external processes and utilized to create customized solutions for client specific requirements. The bank has identified certain focus sectors based on the following parameters. Potential to add value in providing banking products; Recognition and appreciation of knowledge as a differentiator; Growth potential of the sector; opportunities for banking products and competitor activity; India's competitive position internationally, in the sector.

To differentiate itself from a host of other players in the industry, Yes Bank has adopted a knowledge banking approach. A distinct method of customer acquisition and retention, this strategy is a knowledge-based approach that uses the banks understanding of its clients industries and businesses. The bank is primarily focusing on 6 key sectors and has put together a team of experienced industry and banking professionals who have the necessary knowledge and skills sets in these sectors. It is also actively working with industry associations, government bodies and chambers of commerce in various capacities, which enables it to have a representation in these decision- making bodies and provides an edge to its corporate borrowers. Thus, rather than competing with its peers in terms of pricing power (margins), the bank easily differentiates itself by offering advisory services to its customers. We believe that there is a room for Yes Bank to grow in the long-term and we are fairly confident that the management will be able to guide the bank well.



The Bank has already commenced its knowledge banking approach with respect to some key sectors by mobilizing a team of experienced industry and banking professionals who have the necessary knowledge and skills sets in identified focus sectors and are actively working with industry associations, government bodies and chambers of commerce in various capacities. Further, the Bank is also building competencies in some additional focus sectors.

Business Lines:

YES BANK has three distinct business lines to effectively service the differentiated needs of its target customers.

Corporate & Institutional Banking (C&IB): To cater to the needs of large corporate & institutional clients, MNCs, government companies and PSUs. YES BANK would be a strategic differentiator. The Bank has already identified some focus sectors for Business Banking. YES BANK plans to open multi- functional branches domiciling business banking relationship managers to effectively service the target clients. The Bank recognizes that risk management is a key to success in this business and is constantly focusing on enhancing the robustness of the credit architecture.

Diagram

Wireless Banking Gets the Nod

Already filled with established national and private players, the Indian Financial services marketplace is rapidly becoming communized with many banks offering very similar products and services. For a bank seeking to establish a foot hold in the market place, innovation and differentiation is key. For YES BANK, aiming to be a state-of –the- art technology driven, high quality private Indian Bank that is catering to needs of 'Emerging India' this means developing a competitive advantage through innovative products and services where quality and differentiated customer service is paramount. To help develop this edge, YES BANK turned to Intel R Solution Services for technology guidance to help the bank develop and implement a secure, wireless and mobile solution, delivering a new branch banking experience in line with its "Bank of the Future" vision.

Yes Bank has a young loan portfolio due to which it's Gross and Net NPA at current level is zero. Going ahead also as the bank's exposure to retail credit is minimal due to this the NPA will be at very low levels. But as the loan portfolio we expect some slippages to happen. Yes bank's growth and momentum is higher than its peers, it has largest number of branches relative to peers, at a similar stage of their evolution. Since

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Yes Bank is the newest addition to the Indian private banking sector it has relatively small asset size compared to its stabilized peers but that is made up by its strong growth, quality management and rapidly growing franchise.

Credit Risk Management by Yes Bank

Banks are traditionally risk-adverse, and while many have turned to technology to provide online Web and mobile phone services, few if any have gone wireless because the risks are seen as being very high. But for YES BANK, this was precisely the key element in its strategy –implementing a wireless network infrastructure and a mobility solution- to provide an enhanced customer experience, enabling the bank's staff to be mobile in the branch whilst still being connected to the bank's systems and network. This allows the bank's financial advisors to work with customers when and where the customers want in the branch, which gives the customers a new sense of comfort. In addition, a separate externally facing wireless network provided by a local ISP allows customers to access the Internet at all customer to access the Internet at all customer areas within the branch whether it is for accessing Internet banking or just accessing the Internet for their own personal usage.

Security is vital to any bank, and to make this work, Yes Bank needed the wireless network infrastructure to be both secure and reliable. For this Yes bank worked with their infrastructure vendor Wipro, to design the wireless infrastructure. Then, relying on their trusted advisor relationship with Intel, the bank chose Intel Solution Services, Intel Corporation's worldwide professional service organization, to validate the wireless design and deployment to make sure the infrastructure adhere to the highest standards. Intel provided the technology guidance to Yes Bank to fine – tune its requirements, to optimize the design for their existing infrastructure and to verify the pilot implantation.

YES BANK'S objective was to increase the level of customer service and value for both the bank and the customer. By being truly mobile, financial advisors are able to work with their high-net worth and private banking customers where and when the customer wants, all the while maintaining a secure and active connection to the systems needed to

service the customer. Free Internet access for the customer also completely changes the banking experience and makes a visit to the bank much more than just a bank, but a place where the customer can complete both financial and personal business in a comfortable, and welcoming environment. With the wireless design validation and implementation to place, Yes Bank is now able to make use of this infrastructure to provide its customers with a new branch banking experience in line with its Bank of the future vision.

Returns At Par with The Best in The Industry

Yes Bank's total return on assets (other as well as interest income) as a percentage of total assets employed compares very favorably with some of the best-managed smaller private sector banks. Although the NIMs of the bank are lower than that of HDFC Bank, the high proportion of other income more than makes up for it. This justifies the bank's earnings capability and valuation, which we have accorded at par to that of HDFC Bank. Nonetheless, from a conservative standpoint, we have estimated Yes Bank's NIMs to pare to 43% of total income by FY09.

Well Hedged Against Interest Risks:

Yes Bank had about 60% of its treasury portfolio in Treasury Bills (at the end of FYO6), which are not to be marked to market with the rise in interest rates. The rest comprised of debentures (24%) and corporate bonds (16%). The corporate bonds (which are to be marked to market) have a 2- year duration and 35% of this is currently in the HTM basket. Besides, the bank has very little exposure to the equity market. We, therefore, do not see the bank facing any significant risks on the treasury side going forward.

Well Capitalized:

Yes Bank, with a capital adequacy ratio of 16.4% 9(in FY06) is well capitalized to comply with the Basel-II norms. However, taking into consideration its aggressive growth plans, which include venturing into retail assets, branch expansion and employee recruitment, the bank is envisaging an overseas listing (through GDR) or Qualified

Institutional Placement (QIP) to the tune of US$100 m*by 1QFY08.This will adequately fund the bank's foray into retail assets as well as its future growth plans. Also, since the bank has outsourced significant parts of its technology infrastructure and hardware (strategic partnership with Wipro InfoTech), which gives it an advantage over banks with traditional systems and in-house processing. It has saved itself significant capital cost. Besides, outsourcing has provided the bank with the flexibility of a variable cost structure that can be scaled based on its expansion plans.

The bank has built up specialized domain knowledge and understanding in some key sectors, including food and agribusiness, life-sciences, telecommunications, media and technology, infrastructure, and select manufacturing industries including textiles. The growth in non-food credit is closely linked to the GDP growth of the country. With the contribution of non-food credit to GDP having grown from 28% in FY02 to in 47% in FY06, we see a higher proportion of the same being inevitable to keep the GDP growth of the country at a sustainable 7.5% per annum. Also, the rising income levels and ongoing capex drive of the corporate make the case strong for retail and corporate leading respectively. Nevertheless, the high base assumed in FY06 and hardening interest rated my limit growth on certain counters. Based on these factors we have assigned a medium risk rating of 4 to the stock. A larger share of promoter holding indicates the confidence of the people who run it. We believe that greater than 40% promoter holding indicates safety for retail investors. At the end of March 2006, the promoter holding in Yes bank stood at 38.6%. We have assigned a medium risk rating of 6 to the stock.

Yes Bank's competence in terms of high technological expertise, quality of management and differentiated knowledge banking approach has enabled it carve a niche for itself in the commoditized banking sector. Also, the bank's business model trails that of multinationals like Rabo Bank (one of its key promoters), Citibank and HSBC, which rely largely on steady fee income. It therefore, despite being a new comer with limited capital and reach, has overcome the barriers of entry into the sector. What we are particularly enthused about the bank is that it has positioned itself differently and competed primarily with the foreign banks (as against other private sector banks), which

are handicapped in terms of organic and inorganic growth due to the RBI regulations until FY09.

Despite the growing emphasis on the retail sector, there is vast room for improvement in service standards. The bank, which has entered into alliances with best-of –breed technology partners –and has won awards from AC Nielson (For technology Innovation) and the National Association of Software and Service Companies (For IT innovations in Emerging India)- Aims "to create a delightful experience" for its customers, and fill" the missing link" in the Indian banking sector. The bank also offers wealth management services to both resident high net worth individuals and for global Indians'.

Yes bank also has ambitious diversification plans, including a foray into retail broking, the setting up of a mutual fund, and also an insurance venture- the last probably with an international partner. "We also have aspirations of setting up a technology outsourcing subsidiary, and a micro-finance institution," Though the bank's key team helps other companies to acquire firms abroad. The authority sees organic growth ahead and does not want to dilute the bank's quality systems by acquiring other banks. As with many new generation banks, Yes Bank has significant fee-based activity. The bank also has the ability to effectively manage its capital, and follows prudent risk management systems.

The bank's mantra is to say 'Yes' to offering innovative financial solutions to adopting international best practices, to providing high standards of service, and to transparency in its operations.

Diagram

Customer decisioning: Yes Bank advises clients on how to use statistical techniques to predict and control customer behavior, and implement strategies that best influence that behaviour. A first step is often an Exploratory Data Analysis that assesses the extent to which business benefits can be derived from statistical modelling techniques.

Collections operations analysis and assessment: - They offer in depth analysis of all major elements integral to a high –performing collections operation: customer risk segmentation, collections strategies, staff credit policies, performance measures, process reengineering and technology infrastructure.

Credit risk management workshop: Yes Bank can conduct standard or customized workshops in credit risk management best practices for all levels of the organization. Yes Bank has the tools, insights and expertise to help our clients use credit risk management to maximize customer profitability and sustain shareholder demands, they have helped more than 200 leading organizations improve their credit risk management process and realize true benefits such as a reduction in net bad debt, operational cost savings and a decline in customer churn. Achieving customer acceptance of the Yes Bank brand in the market segments in which we intend to operate s critical to our business. Despite employing professional market research, advertisement and publicity services to develop our brand, we have insufficient information to make any assurance with regard to our brand's acceptance in the Indian market. It is difficult to evaluate our business prospects because our operating history is very limited and will not be indicative of our future results of operations or financial condition. As a new bank, we do not have an operating history or meaning or financial information sufficient for investors to make an investment decision. Accordingly, investing in a new bank such as Yes Bank is subject to a high degree of risk. This risk is likely greater than investing in banks with established operating histories and with demonstrated financial performance.

Bank Risk-Taking and Competition Revisited: New Theory and New Evidence

It has been a widely –held belief among policy makers that more competition in banking is associated, ceteris paribus, with greater instability (more failures). Since bank failures are almost universally associated with negative externalities, this has been seen as a social cost of "too much competition in banking". Yet the existing empirical evidence on this topic is mixed and theory too has produced conflicting predictions. In this paper we investigate this important policy issue bringing to bear new theory and new evidence.

Our previous work (Boyd and De Nicolo, 2005) reviewed the existing theoretical research on this topic and concluded that it has had a profound influence on policy makers, both at central banks and at international agencies. We next demonstrated that the conclusions of previous theoretical research were fragile, depending on the assumption that competition is only allowed in deposit markets but suppressed in loan markets.

A critical question in such models is whether banks asset allocation decisions are best modeled as a "portfolio allocation problem" or as an "optimal contracting problem". By "portfolio allocation problem", we mean a situation in which the bank allocates its assets to a set of financial claims, taking all return distribution as parametric. Purchasing some quantity of government bonds would be an example. By 'optimal contracting problem'. By "portfolio allocation problem", we mean a situation in which the bank allocates its assets to a set of financial claims, taking all return distributions as parametric. Purchasing some quantity of government bonds would be an example. By "optimal contracting problem," we mean a situation in which there is private information and borrower's actions will depend on loan rates and other lending terms. Realistically, we know that banks are generally involved in both kinds of activity simultaneously. They acquire bonds and other traded securities in competitive markets in which there is essentially no private information and in which they are price takers. At the same time, they make many different kinds of loans in perfectly competitive markets with private information. Therefore, it should be useful to consider an environment in which both kinds of activity can occur simultaneously. That is what is done here.

We study two new banking models in which a non-trival bank asset allocation decision is introduced by allowing banks to invest in a riskless asset called a bond. The first model has its roots in earlier work by Allen and Gale (2000, 2004) (hereafter the "CVH or charter value hypothesis "model) mirrors the modelling environment presented in several other studies (e.g. Keeley ,1990; Hellman, Murdoch and Stiglitz, 2000; and Repullo,2004). It allows for competition in deposit, but not in loan markets and there is no contracting problem between banks and borrowers. The second builds on the work of

Boyd and De Nicolo (2005) (hereafter the BDN model). It allows for competition in both loan and deposit markets and banks solve an optimal contracting problem with their borrowers.

Allowing banks to hold risk-free bonds results in considerable increased complexity but yields a rich new set of predictions. First, when the possibility of investing in riskless bonds is introduced, bank's investment in bonds can be viewed as a choice of "collateral". When bond holdings are sufficiently large, deposits become risk free. Second, the asset allocation between bonds and loans becomes a strategic variable since changes in the quantity of loans will change the return on loans relative to return on bonds. Third, the new theoretical environments produce an interesting prediction that is invisible unless both loan and bond markets are modeled simultaneously. A bank's optimal quantity of loans, bonds and deposits will depend on the degree of competition it faces. Thus, the banking industry's optimal portfolio choice will depend on the degree of competition.

Now such a relationship is of more than theoretical interest. One of the key economic contributions of banks is believed to be their role in efficiently intermediating between borrowers and lenders in the sense of Diamond (1984) or Boyd and Prescott (1986). But banks would play no such role if they just raised deposit funds and used them to acquire risk-free bonds. Thus, if competition affects banks choices between loans and risk-free investments that is almost sure to have welfare consequences. To our knowledge, this margin has not been recognized or explored elsewhere in the literature.

The two models yield opposite predictions with respect to banks risk-taking but similar predictions with respect to portfolio allocations. The CVH model predicts a positive relationship between the number of banks and bank's risk of failure. The BDN model predicts a negative relationship. By contrast, both models can predict that banks will allocate relatively larger amounts of total assets to lending as competition increases.

Both models have an additional implication that is new and potentially important. It is that the relationship between bank competition and profitability can easily be non-monotone. For example, as the number of banks in a market increases, it is possible that either profits per bank or profits scaled by assets are first increasing over some range, and then decreasing thereafter. This theoretical finding casts doubts on the relevance of results of empirical studies that have assumed a prior that the theoretically expected relationship is monotonic.

We explore the predictions of the two models empirically using two data sets: a cross-sectional sample of about 2,500 U.S. banks in 2003, and an international panel data set with bank-year observations ranging from 13,000 to 18,000 in 134 non industrialized countries for the period 1993-2004.We present a set of regressions relating measures of concentration to measures of risk of failure, and to loan-to asset ratios. The main results with the two different samples are qualitatively identical. First, bank's probability of failure is positively and significantly related to concentration, ceteris paribus. Thus, the risk implications of the CVH model are not supported by the data, while those of the BDN model. Second, the loan to asset ratio is negatively and significantly associated with concentration. This result is broadly consistent with the predictions of both models.

Finally, we find that in our empirical tests bank profits are monotonically increasing in concentration with both data sets. This finding is consistent with the conventional wisdom and with some but not all other empirical investigations.

The reminder of the paper is composed of three sections. Section II analyzes the CVH and the BDN models. Section III presents the evidence. Section IV concludes discussing the implications of our findings for further research.

II. THEORY

In the next two subsections we describe and analyze the CVH and BDN models. The last subsection summarizes and compares the results for both models.

A. The CVH Model

We modify Allen and Gale's (2000,2004) model with deposit market competition by allowing banks to invest in bonds, and also have access to a set of risky technologies indexed by S given an input level y, the risky technology yields S with probability p(S) and O otherwise. We make the following.

Assumption 1 P: [S, S] a [0,1] satisfies:

p(S)=1 p(S)=0, p'<0 and p" <0 for all S@ (S, S) and (b)p(S*) S*>r p(S*) S*>r

Condition1 (a) states that p(S)S is strictly conclave function of S and reaches a maximum S* when p'(S*) S*+p(S*) = 0. Given an input level, increasing S from the left of S* entails increase in both the probability of failure and expected return. Condition 1(b) states that the return in the good date (positive output) associated with the most efficient technology are larger than the return on bonds. The bank's (date0) choice of S is unobservable to outsiders. At date I outsiders can only observe and verify at no cost whether the investment's outcome has been successful (positive output) or unsuccessful (zero output). By consumption deposit contracts are simple debt contracts. In the event that the investment outcome is unsuccessful, depositors are assumed to have priority of claims on the bank's assets, given by the total proceeds of bond investment, if any.

The deposits of bank I are denoted by iD, and total deposits by I

NiiZD= ρ= ≡Σ.Deposits are insured ,so that their supply does not depend on risk, and for this insurance banks pay a flat rate deposit insurance premium standardized to zero. Thus, the inverse supply of deposits is donated with ( ) DDr =r Z,2 with

Assumption 2. rD'>0, rD">0. Banks are assumed to compete for depositors is la Cournot. In our two-period context, this assumption is fairly general. As shown by Kreps and Scheinkman (1983), the outcome of this competition is equivalent to a two- stage game where in the first stage banks commit to invest in observable "capacity" (deposit and loan service facilities, such as branches, ATM etc.) and in the second stage they compete in prices. Under this assumption, each bank chooses the risk parameter S ,the

investment in the technology L, bond holdings B and deposits D that are the best responses to the strategies of other banks .Let *I j I jDD-≠≡* Σ denote total deposit choices of all banks except bank i.Thus, a bank chooses the four- tuple( )2,,,0, S L B D S xR to maximize ( ) ( ) (1( )) max {0,( )} *DiDipSSLrBrDDDpSrB*rDDD - -+ -++ --+(1,a) subject to L +B=D (2,a)

As it is apparent by inspecting objective (1, a), banks can be viewed s choosing between two types of strategies. The first one results in max {.}>0. In this case there is no moral hazard and deposits become risk free. The second one results in max {.}=0.In this case there is moral hazard and deposits are risky. Of course, banks will choose the strategy that yields the highest expected profit. We describe each strategy in turn.

No- moral – hazard (NMH) strategy

If ( )DirBr DDD - , bank's investment in bonds is sufficiently large to pay depositors all their promised deposit payments. Equivalently, a positive investment in bonds may be viewed as a choice of "collateral". In this case, banks may "voluntarily" provide insurance to depositors in the bad state and give up the opportunity to exploit the option value of limited liability (and deposit insurance). Under this strategy a bank chooses

( ) 3,,,0,SLBDSxR to maximize

( ) Dip SSLrBrDDD -++-+(5.a)

Subject to (2 a) and (4.a)

Substituting (2. a) in (5. a), it is evident that the objective function is strictly increasing (decreasing) in L (in B). Thus, (4, a) is satisfied at equality, yielding optimal solutions for loans and bonds given by *() /DiBrDDDr-=+ and *(1 D(i)) LrDDD

R- +

= -(6. a)

In sum, when banks pre-commit to the risk choice S* at the time they minimize the amount of bond holdings necessary to make deposits risk-free. By assumption 2(a) (the expected return on the most efficient technology is strictly greater than the return on bonds) it is optimal for a bank to set L at the maximum level consistent with constraints (2.a) and (4.a)

Furthermore, substituting (6.a) in (5.a) and differentiating the resulting objective with respect to D, the optimal level of deposits, denoted by D* satisfies:

(*) (*) *0 Di Dirr DDrDDD - - -+- ‘+= (7.a)

Substituting (7.a) into the objective function, the profits achieved by a bank under the NMH strategy are given by:

**

( ) ( ) ( )*2i Di

D pS Sr DDD

r - - $\Pi \equiv' +$ (8.a)

Finally, observe that the profit obtained by investing in bonds only (B= D) are given by (*) *2 Dir DDD – ‘+. By Assumption 1(b) this profit is always lower than the profit in (8.a)

Therefore, banks will never invest only in bonds.

Denote with $\alpha(.) \equiv \frac{L}{D}$ the loan to asset ratio, and let the four-tuple

{*, *( ),*( ),*( )} iii SLD DDD $---$ denote the best –response functions of a bank when the NMH strategy is chosen. The following Lemma summarizes the properties of optimal choices and profits.

Lemma 1(a)

Proof: Differentiation of conditions (4.a) and (7.a) at equality and application of the Envelope Theorem.

Moral –hazard (MH) strategy

If ( ) DirBr DDD - < + , banks a bond investment level that is insufficient to pay depositors their promised deposit payments whenever the bad state (zero output)occurs.

In contrast to the previous case, banks exploit the option value of limited liability (and deposit insurance), and therefore, there is moral hazard.

Now, a bank chooses the triple ( ) 3,,[0,] SLDSxR + to maximize:

( ) (( )(( )) Dir SSrLrrDDD− − + − + (9.a) subject to (2.a) and ( )Dir BrDDD−< +(10. a)

Substituting to (2.a) and (9.a) and differentiating (9.a) with respect to S, the optimal level of risk, denoted by S%, satisfies ( ) ((( ))) ( ) 0 Dip S SLrLrrDDDpSL –'%%-+ - ++%=(11.a)

Rearranging (11.a), it can be easily verified that ( ) ( ) 0 p SSpS' +<%%% for any ( )2,L D R + +∈

Hence,S%>S* by the strict concavity of the function p(S)S. Since p(S*)S*>r by Assumption 1 (b) ,,S*> S%> r. This implies that the return to lending in the good state is larger than r, and therefore the optimal loan choice is L=D.Such a choice exploits the benefits of limited liability by maximizing the return in the good state and minimizing the bank's liability in the bad state by setting B=0. In turn, bank deposits D are chosen to maximize ( ) (( )) Dip SSr DDD --+.By differentiating this expression ,the optimal choice of deposits ,denoted by D% satisfies:

( ) ( ) 0 Di Di Sr DD r DDD--% - + % -'+ % %=(12.a)

Let the pair { ( ), ( )}ii S DDD- -

%% denote the best –response functions of a bank when the MH strategy is chosen. The profits achieved by a bank under the MH strategy are given

by: ( ) ( )(( )) iDiDpSSrDDD— Π %≡ %% − +%%(13.a)

The following Lemma summarizes the properties of optimal choices and profits.

b) Lemma2

-1 < dD < 0; (b) dS dD dD

Proof: Differentiation of conditions (11. a) and (12. a) and application of the Envelope Theorem. Proof: Differentiation of conditions (11.a) and (12.a) and application of the envelope theorem.

Nash Equlibria

We focus on symmetric Nash equilbria in pure strategies.3 From the preceeding analysis, these equilbria can be of at most two types: either NMH (no-moral-hazard) or MH (moral- hazard) equilibria. The occurrence of one or the other type of equilibrium depends on the shape of the function p(.)The slope of the deposit function, and the number of competitors. This can be readily inferred by comparing the bank profits under the NMH and MH strategy given by equations (7.a) and (13.a) respectively. Ceteris paribus, expected profits under the NMH are larger than those under the MH strategy the larger is p(S *) S*/r , the lowest is p(S%) ,and the smaller is the difference of the optimal choice of deposits under the two strategies. This intuition is made precise below. Recall that Π% (0) and Π % (0)

denote the profits of a monopolist bank choosing the MH and NMH strategy respectively. We can state the following proposition.

Proposition 1

(a) If Π % (0)≥ Π*(0), then the unique Nash equilibrium is a moral- hazard (MH) equilibrium. The loan to asset ratio for all N.

(b) If% (0)< Π ∗ (0) ,then there exist values 1N and 2N satisfying 121<N<N

Such that:

(i) For all 1 N ∈ [1 ,N] the unique equilibrium is a no- moral-hazard (NMH)equilibrium, and the loan to asset ratio is less than 1and decreases in N.

(ii) For all 12 N∈ [N, N] , the equilibrium is either NMH, with a decreasing in N, or MH withα =1, or both

(iii) For all 2 N>N the unique equilibrium is a moral-hazard (MH) equilibrium with $\alpha = 1.$

Proof:

(a) By Lemmas 1(d) and 2(c), as iD- increases, profits under the MH strategy decline at a slower rate than profits under the NMH strategy. Thus, If,Π%(0) ≥ Π ∗ (0) then profits under the MH strategy are always larger than those under the NMH strategy for any iD-

Let Z* (N) =(N-1) D* and Z%(N)=(N-1) D%, Since S%>S*, D*<D% for all iD-.

Therefore, as N→ ∞, Z ∗ (N) → Z ∗, Z%(N) → Z %. By Lemmas 1 and 2Π% (Z% (N))→ 0 and Π ∗ (Z(N)) → 0. Thus, for all N, Π%((N-1) D*)

(b)Since Π%(0) < Π*(0), Lemmas 1(d) and 2 (c) imply that the profit functions under the MH and the NMH strategies intersect. Thus, there exists a iD- such that

( ) * ( ) ii DD − − =Π. Let *

2 1 ( ) ( ) iZNDZN−== %. Since D*< D%,2 1 N> $N > 1.$

(i) For all N such that * ( ) ( ) iDZNZN−≤< %,Π %(Z%(N))> Π%(Z*(N)) and Π% (Z% (N))≥ Π ∗ (Z%(N)) hold. Thus ,for all 1 2 N ∈ [N, N]

Both NMH and MH equilibria exist, and the implications for α are again deduced from Lemmas 1 and 2 Q.E.D.

The interpretation of this proposition is as follows. If Π% (0)$\geq \Pi * \mathbf{0}(part(a))$, it is always optimal for a deviant bank to set both their deposits and the risk shifting parameters high enough so that the it can capture a large share of the market. Its profits in the good state under MH will be high enough to offset the lower probability of a good outcome. This is why the MH equilibrium is unique. Note that in this case, banks always allocate all their funds to loans, that is the loan- to – asset ratio is always unity. This result is illustrated for some economies with p(S)=1-AS, where A$\in (0,1)$, and ( ) Dr x=xβ ,where $\beta \geq 1$.

The first panel of figure 1 shows the risk parameter, the second one bank profits under an NMH deviation minus profits under MH equilibrium, as a function of N.

Risk shifting increases in the number of banks, and an NMH deviation is never profitable when all banks choose an MH strategy, while the reverse is always true. Note that in this case, the loan to asset ratio does not depend on the number of competitors, since it is always unity.

IfΠ % (0) $< \Pi * (\mathbf{0})$ (part (b)), the relative profitability of deviations will depend on the size of the difference, the larger (smaller) is the profitability of a MH (NMH) deviation. When this difference is relatively small, values of N the NMH equilibrium prevails, for intermediate values of N both equilibria are possible and for larger values of N the unique equilibrium is MH.

In this case, the relationship between the loan to asset ratio and the number of competitors is not monotone. It declines for low values of N ,it is indeterminate,(between unity and a value less than unity)for an intermediate range of N, and then it jumps up to unity beyond some threshold level of N , and is constant for all Ns above this threshold.Figure2 illustrates a case for an economy identical to that of figure 1,except that the elasticity of deposit demand is higher ($\beta = 5$). Multiple equilibria exist when the number of banks is between 2 and 7 .For all N$>$ 7, we are back to a unique MH symmetric equilibria.

Profitability And the Number of Competitors

In the equilibrium of case (a), bank profits monotonically decline as N increases. Importantly, case (b) shows that for values of N not "too large", the relationship between the number of banks and bank profits or scaled measures of profitability, such as returns on assets (in the model, profits divided by total deposits), is not monotone. As shown in the first panel of figure 3, which reports the ratio of profits under the NMH strategy relative to profits under the MH strategy, it is evident that bank expected profits (and profits scaled by deposits) exhibit a non- monotonic relationship with N (profits jump up when N increases from 6 to 7).

The BDN Model

BDN Model

We modify the model used in our previous work (Boyd and De Nicolo ,2005) by allowing banks to invest in risk-free bonds that yield a gross interest rate. Consider many entrepreneurs who have no resources, but can operate one project of fixed size, normalized to 1, with the two- point random return structure previously described.

Entrepreneurs may borrow from banks, who cannot observe their risk shifting choice S, but take into account the best response of entrepreneurs to their choice of the loan rate. Given a loan rate Lr, entrepreneurs choose S∈ □□0, S□ to maximize: ( ) ( ) L pS S- r. By the strict concavity of the objective function, an interior function, an interior solution to the above problem is characterized by

( )( ) ( ) LpS hSSr pS ≡ +=,.(1.b)

If ( ) Lh S= S>r, that is when the loan rate is not too high. Conversely, if ( ) L hS = S < r the loan rate is sufficiently high to induce the

Let 1

Nii XL== $\sum$ denote the total amount of loans. Consistent with our treatment of deposit market competition, we assume that the rate of interest on loans is a function of total loans: ( )LL r= rX. This inverse demand for loans can be generated by a population of potential borrowers whose reservation utility to operate the productive technology differs. The inverse demand for loans satisfies *Assumption3. (0) 0, LL r>r'< and (0) (0) L Dr>r,* With the last condition ensuring the existence of equilibrium. With Assumption 3, and if loan rates are not too high, equation (1. b) defines implicitly the equilibrium risk choice S as a function of total loans, ( ) ( ) Lh S= rX. By Assumption 1(a), h'(.)>2.Thus, equation (1.b) can be inverted to yield ( ) 1( )) LSX=h-rX Differentiating this expression yields ( ) 1 (( ) ( ) 0LLS' X= h-'rXr'X< for all X such that S(X)<S. If loan rates are too high, entrepreneurs will choose the maximum level of risk. From (1.b), if (0) Lr>s, then S(X) =S for all X≤ X, where X satisfies ( ) L S= rX.

Therefore, if the total supply of loans is greater than the threshold value X, then a decrease (increase) in the interest rate on loans will induce entrepreneurs to choose less more risk through a decrease (increase) in S. These facts are summarized in the following lemma. To streamline notation, we use P(X)≡ p(S(X)) hence forth.

Lemma 3 Let X satisfy ( ) LS = rX. If (0) Lr>S, then S(X) =S and P(X) = 0 for all X ≤ X: and S'(X) <0 and P'(X)>0 for all X>X.

Turning to the bank problem, let ijijLL- ≠≡ $\sum$ denote the sum of loans chosen by all banks except bank i. Each bank chooses deposits, loans and bond holdings so as to maximize profits, given similar choices of the other banks and taking into account the entrepreneur's choice of S. Thus, each bank chooses ( ) 3,, LBDR+ ∈ to maximize

( ) ( ) ( ) iLiDiPLLrLLLrBrDDD− − − + + + − + +

(1 ( ) max { 0,( ) } iDi PLLrBrDDD− − − + − + (2.b)

Subject to L+B = D

As before, we split the problem above into two sub-problems. The first problem is one in which a bank adopts a no-moral hazard strategy (NMH) (( )Dir Br DDD$-\geq +)$. If no loans are supplied ,we term this strategy a credit rationing strategy (CR) for the reasons detailed below. The second problem is one in which a bank adopts a moral hazard (MH) strategy (( ) DirBr DDD$-\leq +)$.

For ease of exposition, in the sequel we substitute constraint (3.b) into objective (2.b)

No-moral –hazard (NMH) strategies

If ( ) DirBrDDD$-\geq +,$ a bank chooses the pair ( ) 2, LDR $+\epsilon$ to maximize

(( ) ( )) (( )) iLiDiPLLrLLrLrrDDD$---++-+-+.(4.b)$

Differentiating (4.b) with respect to D, the optimal choice of deposits, denoted by D* Satisfies

(*) (*) * 0 Di Dirr DDr DDD$---+-$ $'+=$ (6. b)

Note that the choice of deposits is independent of the choice of lending , but not vice versa. Let

( ) ((*)) * iDiDrrDDD$--\Pi\equiv-+.$ Thus, a bank chooses L≥ 0 to maximize : (( ) ( )) ( ) iLiiPLLrLLrLD$---++-+\Pi$. (7.b)

Subject to ( ) / iL Dr$-\leq \Pi$ (8.b)

Let the pair { * ( ),* ( ) } ii LLDDdenote the best –response functions of a bank.Of particular interest is the case in which there is no lending of a bank's competitors plus the maximum lending a bank can offer under a NMH strategy is lower than the threshold level that forces entrepreneurs to choose the maximum level of risk S.This is stated in the following

Lemma 4 If ( ) / ii LDr X$--+\Pi\leq,then*0iLL-=$

Proof: By Lemma 3 and inequality (8.b) ,( ) 0i PLL$-+=$ for all ( ) /iL Dr$-\leq\Pi$.

Thus,

*( ) 0iLL$-=$ Q.E.D.

We term a NMH strategy that results in banks investing in bonds only a credit rationing (CR) strategy. The intuition for this is as follows. With few competitors in the loan market, it may be that, even though entrepreneurs are willing to demand funds pay the relevant interest rate, loans will not be supplied. This can happen because the high rent banks are extracting from entrepreneurs would force them to choose a level of risk so high as to make the probability of a good outcome small. If this probability is small enough, the expected returns from lending would be negative. Hence, holding bonds only would be banks preferred choice. Of course, under this strategy banks are default –risk free.

As we will show momentarily, bank's choice of providing no credit to entrepreneurs may occur as a symmetric equilibrium outcome for values of N not "too large". As further stressed below, the main reason for this result is that a low probability of a good outcome will also reduce the portion of expected profits deriving from market power rents in the deposit market. The occurrence of this ultimately depends on the relative slopes of functions P(.), (.) Lr and (.) Dr.

Moral –hazard (MH) strategy

Under this strategy, a bank chooses ( ) 2, LDR $+\epsilon$ to maximize

( ) [(( )) (( ))] iLiDiPLLrLLrDDD$- - - + + - + - +$

Subject to (( )) D irr DDDrL$- - +\leq$ (9.b)

And L $\leq$ D (10.b)

Let L% and D% denote the optimal lending and deposit choices respectively. It is obvious that for this strategy to be adopted, ( ) 0 LirLLr$- + \% ->$ must hold.If ( ) 0Lir LLr$- + \% ->$

And constraint (9.b) is satisfied at equality, and then the objective would be

((.)) (( )) LDiPrrLrr DDD$- - + - +$, which represents the profits achievable under a NMH strategy.Thus, for an MH strategy to be adopted ,constraint (9.b) is never binding.

Let λ denote the Kuhn- Tucker multiplier associated with constant (10.b). The necessary conditions for the optimality of choices of L and D are given by:

( ) [(( )) (( ))] iLiDiPLLrLLrrDDD− − − ‘+ + − + − +

( )[( ) ( )] 0iLiLiPLLrLLrLLLrλ − − − + + + ’++= (11.b)

( ) [( ) ( )] 0iD iD iPLLrrDDrDDDλ− − − + − + − ‘++= (12.b)

$\lambda \geq$ 0, λ(L-D) = 0 (13.b)

Recall that an interior solution (constraint (10.b) is not binding) will entail strictly positive bond holdings (B$>$ 0, *or,* equivalently, L$<$ D).

We now establish two results which will be used to characterize symmetric Nash equilibria. To this end, denote with MH (,)

iiLD$>$ − − Π the profits attained under a NMH strategy. The following Lemma establishes that for a not too small level of competitors total deposits and any level of competitors deposits and MH strategy always dominates a NMH strategy:

Lemma 5 There exists a value I D-

% Such that MH (,) NMH (,)

iiiiLDLD− − − − Π > Π *for all*

ii DD−−> % *and all i L*−.

Proof: Under NMH, NMH (,) NMH (*,) ( )

iiiiLDRLLD− − − − Π = +Π, *where* ,

NMH (,) ((*) (*))

iiLiRLLPLLrLLr− − −≡ + + −. Under a MH strategy with a positive amount of bond holdings ,0 1MH

(,) ( ) ( )

BiiiiLDRLL PLLD> − − − − − % ≡ +% + % − %. Since MH (,)

iRLL−>> NMH (,)

iRLL for all

L> 0, MH(,)

Irll−. Thus,

*

01 MH (,) NMH (,)MH (,) NMH (,) (( ) 1) ( )

BiiiiiiiLDLDRLLRLLPLLD> − − − − − − − − − − − Π − Π = % − + + % − Π.

Since ( ) iD – Π is strictly decreasing in iD- .there exists a value iD-%

Such that ( )iD –Π % = 0

Thus,for all ii DD −−> % and all iL- ,OMH(,) NMH(,)0.

BiiiiLDLD−−> − − Π ≥ Π, it follows that MH (,) NMH (,)

iiiiLDLD− − − − Π > Π. Q. E. D

Now, denote with CR ( ) ( )

iiDD− − Π ≡ Π the profits attainable under a credit rationing (CR)

strategy. The following Lemma establishes that for a not too large level of competitor's total loans and any level of competitors deposits, a CR strategy can dominate a MH strategy:

Lemma 6 If CR (0) MH (0,)

iD−Π > Π, then there exists a value iL-

% Such that

CR ( ) MH (,)

IiiDLD $---\Pi > \Pi$ for all ii LL$--< \% and$ all iD$-$.

Proof: If CR (0) MH (0,)

iD $-> \Pi$,then a monopolist finds it optimal not to lend. Suppose

MH (,) CR( )

iii LDD$---\Pi > \Pi$ for some 0iL $->$ a

MH strategy would never be chosen). Then MH (0,)

iiLD $--\Pi$ is monotonically increasing in

iL and, by continuity, there exists a value iL

% that satisfies CR ( ) MH (,)

iiiDLD $---\Pi = \Pi\%.$

Thus, for all iiLL$--<$ % and all iD$-$ CR ( ) MH(,)

Iii DLD $---\Pi = \Pi$ holds Q.E.D.

Nash Equilibria

Symmetric Nash Equilibria in pure strategies can be of at most of three types: no –moral hazard without lending (ie credit rationing, CR), no-moral hazard with positive lending (NMH), or moral hazard (MH) eqilibria. The occurrence of one or the other type of equilibrium depends on the shape of the function

P(.), the slope of the loan and deposit functions, as well as the number of competitors.

The following proposition provides a partial characterization of symmetric Nash equlibria.

Proposition 2

(a) If $\Pi^{CR}(0) > \Pi^{MH}(0,0)$, then there exists a $1 N \geq 1$ such that the unique symmetric Nash Equilibrium for all $1 N \leq N$ the unique equilibrium is MH.

Proof:

(a) Setting (1) iDND $-= -\% and$ (1) iLNL $-= -\%$,where the right-hand side terms are the total deposits and loans of all competitors of a bank in a symmetric Nash equilibrium respectively, the result obtains by applying Lemma 6.

(b) Using the same substitutions as in (a), the result obtains by applying Lemma5.

Q.E. D The interpretation of Proposition 2 is straight forward. Part (a) says that if expected return of a monopolist bank that invests in bonds only is lower than the return achievable under a MH strategy, than the CR equilibrium would prevail for a range of low values of N. Thus, this model can generate credit rationing as an equilibrium outcome. Note again that in such equilibria, entrepreneurs are willing to demand funds and pay the relevant interest rate. However, loans are not supplied because the resulting low probability of a good outcome forced on entrepreneurs by high loan rates reduces banks expected rents extracted in the deposit market. Thus, banks prefer to exploit their pricing power in the deposit market only. This result is similar qualitatively to the credit rationing equilibria obtained in the bank contracting model analyzed by Williamson (1986). Yet, it offers from Williamson's in a key respect: in our model credit rationing arises exclusively as a consequences of bank market structure and the risk choice of entrepreneurs and banks is endogenous. By contrast, Williamson's result arises from specific constellations of preference and technology parameters, and there is no risk choice by entrepreneurs and banks.

Part (b) establishes that for all values of N larger than a certain threshold, the unique equilibrium is an MH equilibrium. In such equilibrium, banks may hold some bonds, or no bonds. The rationale for this result is the mirror image of the previous one. When banks ability to extract rents on both the loan and deposit markets and by maximizing the option value of limited liability through the adoption of a moral – hazard strategy.

The following proposition establishes the negative relationship between competition (the number of banks N) and the risk of failure in MH eqilibria.

Proposition 3. In any MH equilibrium, dX / dN > 0, dZ/ dN>0, dZ/ dN>0 and dP/dN>0.

Proof: Using conditions (11.b) – (13.b) at an interior solution (L<D), we get

( ) (, ,) 0LrX− r− FXZN= (14.b); and ( ) ( ) 0 DD

rr Zr ZZ

N−−′= (15. b), Where

( ) ( ) 2/ ( ) ( ) (, ,)

( ) ( )

DLFXZNPXrZZNPXrXX

PXXPXN

‘ ‘+’≡ −

‘ +

In equilibrium, F (X, Z, N) ≥ 0 has to hold since if F (X, Z, N) < 0, (14. b) would imply ( ) 0 Lr X−r <, which contradicts the optimality of strictly positive lending. By simple differentiation ,0NF < and 0ZF<.

Differentiating (14.b) and (15.b) totally yields:

(( ))

ZN

LX

dX FHFdN

rXFH

+

=

‘ –

(16.b); and

dZ= HdN (17.b) where ( ) 0

(( ) (1) ( ))

D

DD

Hr ZZ

Nr ZNrZ

,≡>

‘ + + “

By the second order

necessary condition for an optimum, ( ) 0L X r’ X- F<.Thus dX/dN >0,dZ/dN >0

By Lemma 3, dP /dN>0.If (11.b) -13. b) imply L=D, banks hold no bonds, and the result follows by Proposition 2 in Boyd and De Nicolo (2005) Q.E.D. With regard to asset allocations, note that an increase in N in a MH equilibrium entails both an increase in total loans and total deposits. Thus, the ratio of loans to assets α (.) $\equiv \frac{X}{Z} = \frac{L}{D}$ Will increase (decrease) depending on whether proportional changes in loans are larger (smaller) than proportional changes in deposits.

Note that the model predicts a relationship between asset allocations and the number of banks that can be, as in the previous model, monotonically increasing beyond certain threshold values of N. This will certainly occur when the functions describing the demand of loans, the supply of deposits and the probability of a good outcome results in no investment in bonds in a MH equilibrium. In this case, α (.) would jump up to unity when N crosses the threshold value2 N of Proposition 2(b). However, this will also occur when banks hold bonds and the number of banks is not too small, as shown in the following

Proposition 4

There exists a finite 3 N such that for all 3N$\geq N, \frac{d\alpha}{dN} > 0$ in any interior MH equilibrium.

Proof: Using (16.b) and (17.b),2

$d1dxZdZX0$

dNZdNdNα = - > if (( )) ZN LX FH FX rXFHZ + > ‘ _

(18.b) Note that / ZN LX F + FH >r’X –F is sufficient for (18.b) to hold, since X<Z.

As N $\rightarrow \infty,$ OXF $\rightarrow, \frac{}{0ZNF}$ +FH$\rightarrow, since\ 0ZF \rightarrow \rightarrow and$ 2 2

(( )) (( )(1) ( )) 0

(( ) ( )) N DD

FPXX rZNrZ

HPXXPXNN $-'$=’ ++” $\rightarrow'$ +

Thus, by continuity, there

Exists a finite value 3N such that for all 3 N$\geq N1$

(( )) ZN LX FHFX rXFHZ+ >> ‘ –

Holds. Therefore, for all 3N$\geq N, \frac{d\alpha}{dN} > 0. Q. E. D$

Figure 3 illustrates the behavior of the risk parameter and the ratio of loan to assets for an economy with p(S) = 1- AS, ( ) ,(0,1) Lrx= x- $\alpha\ \alpha \in and\ \ \in (\ ), 1Dr\ \ x = x\beta\beta \geq .$

The first panel shows the risk parameter S as a function of the number of banks. It indicates credit rationing (S is set equal to 0) when N $\leq 23.$ Beyond that point, the economy switches to a MH equilibrium, with risk jumping up and then decreasing as N increases. At the same time, the loan-to- asset ratio jumps from 0 to unity (second panel).

Profitability and the Number of Banks

As in the previous model, the relationship between profitability and concentration can be non- monotonic. As shown in the third panel, the ratio of bank profits to deposits (the return on assets in our model) declines as the number of banks increases from 1 to 22, then jumps up and declines again as the number of banks increases when N≥ 23 .Thus, in this economy the return on assets is not monotonically related to the number of banks.

B. Summary

With regard to risk, the CVH model predicts that banks risk of failure is strictly increasing in the number of competing firms, and becomes maximal under perfect competition. With regard to asset allocations, this model predicts a loan –to – asset ratio that is either monotonically increasing in the number of firms (with a jump, Proposition 1(a)). or a non- monotonic relationship (Proposition1 (b)), which however leads banks to invest in loans only when N becomes sufficiently large.

The predictions of the BDN model with regard to risk are the opposite of the CVH: banks ‘risk of failure is strictly decreasing in the number of competing firms. With regard to asset allocations, the BDN model predicts a loan – to- asset ratio either monotonically increasing in the number of firms, from 0 to a positive value if credit rationing occurs, or

for large values of N if it does not. Thus, under the standard Nash equilibrium concept, the two models produce divergent predictions concerning risk, but similar predictions for asset allocations. Next, these predictions are confronted with the data, using measurement consistent with theory.

III **EVIDENCE**

We have elsewhere reviewed the existing empirical work on the relationship between competition and risk in banking (Boyd and De Nicolo,2005), and will not repeat that review here. Very, briefly, that body of research mixed conclusions. A serious drawback with most existing work is that it has employed either good measures of bank risk or good measures of bank competition. In the present study we attempt to overcome these problems, employing measures of bank risk and competition that are directly derived from the theory just presented.

Theory Leads Measurement

Our empirical risk measure will be the "Z-score "which is defined as Z = (ROA + EA)/$\sigma(\sigma ROA)$,where ROA is the rate of return on assets., and $\sigma(ROA)$ is an estimate of the standard deviation of the rate of return on assets, all measured with accounting data. This risk measure is monotonically associated with a measure of a bank's probability of failure and has been widely used in the empirical banking and finance literature. It represents the number of standard deviations below the mean by which profits would have to fall so as to just delete equity capital. It does not require that profits be normally distributed to be a valid probability measure; indeed, all it requires is existence of the first four moments of the return distribution. (Roy,1952). Of course, in our theory models banks are for simplicity assumed to operate without equity capital. However, in those models the definition of a bank failure is when gross profits are insufficient to pay off depositors. If there were equity capital in the theory models, bankruptcy would occur precisely when equity capital was depleted. Thus, the empirical risk measure is identical to the theoretical risk measure, augmented to reflect the reality that banks hold equity.

Also consistent with the theory, we measure the degree of competition using the Hirschmanna- Hirfendahl Index (HHI). In the theory models, the degree of competition is more simply represented by the number of competitors. Our empirical choice is dictated by the fact that in the real-world banks are heterogeneous and are not all the same size, as they are in the theory. If they were, the two measures would be isomorphic.

Samples

We employ two different samples with very different characteristics. Each has its advantages and disadvantages and the idea is to search for consistency of results. The first sample is composed of 2,500 U.S. banks that operate only in rural Non-Metropolitan Statistical Areas and is cross-section for one period only, June 2003.The banks in this sample tend to be small and the mean (median)sample asset size is $ 80.8 million ($ 50.2 million).For anti-trust purposes, in such market areas the Federal Reserve Board (FRB) defines a competitive market as a country and maintains and updates deposit HHIs for each market. These computations are done at a very high level of disaggregation. With in each market area the FRB defines a competitor as a banking facility, which could be a bank or a bank branch. This U.S. Sample although non-representative in a number of ways, exhibits extreme variation in competitive conditions. The U.S. sample has another important and unique feature. We asked the FRB to delete from the sample all banks that operated in more than one deposit market area. By limiting the sample in this way, we are able to directly match up competitive market conditions as represented by balanced sheet data. This permits a clean test of the link between competitive conditions and asset composition as predicted by our theory. Obviously, computation of the HHI statistics was done before these deletions and was based on all competitors (banks and branches) in a market. The second sample is a panel data set of about 2700 banks in134 countries excluding major developed countries over the period 1993 to 2004, which is from the Bankscope (Fitch –IBCA) database. We considered all commercial banks (unconsolidated accounts) for which data are available. The sample is thus unaffected by selection bias, as it included all banks operating in each period, including those which exited either because they were absorbed by other banks or

because they were closed. The number of bank year observations ranges from more than 13,000 to 18,000 depending on variables availability. The advantage of this international data set is its size, its panel dimension, and the fact that it includes a great variety of different countries and economic conditions. The primary disadvantage is that bank market definitions are necessarily rather imprecise. It is assumed that the market for each bank in a county is represented by an HHI for that country. To ameliorate this problem, we did not include banks from the U.S., Western Europe and Japan. In these cases, defining the nation as a market is problematic, both because of the country's economic size and because of the presence] of many international banks.

Result for the U.S. Sample

Table 1 defines all variables and sample statistics, while correlations are reported in Table2.Here the Z-score (Z= (ROA + EA)/σ (ROA) is constructed setting EA equal to the ratio of the quarterly average over three years of the book value of equity over total assets. ROA equal to the ratio of net accounting profits after taxes to total assets and σ (ROA) equal to the standard deviation of the rate of return on assets computed over the 12 most recent quarters. As shown in Table1, the mean Z-score is quite high at about 36, reflecting the fact that the sample period is one of profitable and stable operations for U.S. Banks. The average deposit HHI is 2856 if savings and loans are not included. Forty six of the fifty states are represented.

We estimate versions of the following cross-sectional regression:

Ij jj ij ij X = $\alpha + \beta HHI + \lambda Y + \delta Z + \varepsilon$

Where ij X is, Z-score, or the loan- to- asset ratio of bank $_i$ in county, j, j HHI is a deposit HHI in county j,j Y is a vector of county –specific controls and $\beta_j Z$ a vector of bank specific controls.

In these regressions, variables $_{ij}Z$ control for certain differences between the abstract theoretical models and the real world. First, we need to control for bank heterogeneity. In theory, all banks are the same size in equilibrium. In reality, that is not so and we need to control for the possible existence of scale diseconomies. For this purpose, our control variable is the natural logarithm of total bank assets. Second, in reality banks do not employ identical production technologies as they do in the theory. To control for differences in technical efficiency across banks, we include the ratio of non- interest operating cost to total income.

Thirdly, comparing HHI across markets requires that we control for market size (Bresnahan,1989). An HHI may be mechanically lower in large markets, since a greater number of firms can profitably operate there. Our control variable for economic size of market is the product of median per capita county income and population, totally which is essentially a measure of total household income in county trimmed for the effect of outliers.

We also need to control for differences in economic conditions across markets especially difference s in the demand for bank services. Three variables, all computed at a county level, are included for this purpose the percentage growth rate I the labor force LABGRO, the unemployment rate, UNEM and an indicator of agricultural intensity FARM which is the ratio of rural farm population to total population. This variable is included because many of the counties in our sample are primarily agricultural but others are not, thus we need to control for possible systematic differences in agricultural and non-agricultural lending conditions. Unless otherwise noted to further control for regional variations in economic conditions all regressions also include state fixed effects.

For each dependent variable, we present three basic sets of regressions, in increasing order of complexity. The first set is robust OLS regressions with state fixed effects. The second set adds a clustering procedure at the county level to correct significance tests for possible location correlation of errors.13 The third set, retains the state fixed effects and county clustering and employs a GMM instrumental variables procedure in for HHI and

for bank asset size, since both are likely to be partially endogenous functions of regional economic conditions. For example, one might expect that those banking markets experiencing rapid economic growth would observe above-average new entry which would tend to lower the HHI ceteris paribus.

At the same time, rapid economic growth would be expected to raise the size of existing banks in the market, which tend to have opposite effect, ceteris paribus. Table2. Shows that the two HHI measures (HHI0 for banks only and HH100 for banks and thrifts) are significantly correlated with bank (LASSET) and with several of the economic control variables including market size (TOTALLY) and agricultural intensity (FARM). In essence, HHI tends to be positively associated with large banks operating in small, agricultural markets.

Our objective for the instrumental variables is to try to find good instruments for HHI and LASSET. Geographic location, represented by state dummy variables, is a natural candidate. Moreover, state dummy variables should reflect any differences in state regulation and supervision of banks. Fortunately, for our purposes, most of our sample banks are relatively small and thus are state, not federally chartered. 15, thus state regulatory policy differences, if present can be expected to affect most of the sample banks. Interestingly, in only about half of the sample are savings and loan associations present. Since small bank savings and loans usually serve similar customer bases and compete directly, this is strongly suggestive that state policy differences (in the treatment of bank versus S&Ls) are indeed present. As another instrumental variable, therefore we employ the variable HHI_DIF =(HHI00-HHI0) which represents the relative importance of savings and loan associations in market. Obviously, when we use the state dummy variables as instruments for HHI and LASSET, we lose the ability to estimate the model with state fixed effects.

Finally, whenever the range of an explanatory variable is the unit interval (in our case, the ratios of equity to assets and loans to assets) we use a Cox transformation to turn it into an unbounded variable 16.

Z- score regressions

In Table 3 we present regressions in which Z- score, our risk of failure measure, is the dependent variable.3.1 is a regression of Z-score against HHI0, our six control variables (LABGRO, UNEM, FARM, TOTALLY, LASSET, CTI) and with state fixed effects. The coefficient of HHI0 is negative and statistically significant at usual confidence levels.

The same is true when HHI100 is employed as the dependent variable. (In Table 3 and throughout, results with HHI00 the dependent variable are shown in the last row of the table.) Among the control variables, the coefficient of CTI is negative and highly significant; suggesting that cost inefficiency may adversely affect risk of failure. The coefficient of LASSET enters with a negative and highly significant coefficient. Regression 3.2 is identical to that of 3.1 except that is employs a GMM estimator. Here, we use an instrumental variable, county clustering and employs a GMM estimator. Here, we use an instrumental variables procedure for HHI0 and HHI 100, and for the bank size measure, LASSET. Notably, the significance of both measures of HHI compared to 3.1 and 3.2 rises substantially and now exceeds the one percent confidence level.

To summarize, these results suggest that more concentrated bank markets are ceteris paribus associated with greater risk of bank failure. This result seems robust and is supported by many other regressions not presented.

Regressions Of Z-Score Components

In this set of regressions, we examine each of the three components of the Z-score (ROA, EA and σ (ROA). This is done for two reasons: First, to see if we can determine which is principally driving the negative relationship between concentration and Z- score and secondly as a robustness check-17.

Table 4 presents regressions with the rate of return on assets ROA, as the dependent variable and follows our same progressions of regression specifications discussed earlier. In five of the six regressions, ROA is positively and significantly related to HHI; the only exception is with the instrumental variables estimator and when HHI100 is employed.

Also, ROA is positively and significantly associated with bank size, LASSET, in the first two specifications, but not in the third one with instrumental variables. In all specifications, ROA is negatively and significantly associated with CTI, as might be expected. In sum, these results suggest that there exists a positive relationship between concentration in bank markets and bank profitability.

Table 5 presents regressions in which the dependent variable is the (transformed) bank capitalization ratio, EA_ cox. In no specification do we find a statistically significant relation between measures of the HHI and EA_cox.

Table 6 presents regression in which the dependent variable is the natural logarithm of the standard deviation of the return on bank assets, Ln ($\sigma(ROA)$, which ensures that the values of the standard deviation predicted by the regression are non –negative in all six specifications, this variable is positively and significantly associated with the HHI measures; and significance increases to very high levels when the instrumental variables procedure is empolyed.18

Taken together, these results indicate the positive association between market concentration and risk of failure is driven primarily by a positive association between concentration and volatility of the rate of return on assets. This relationship is strong enough to overcome the positive relationship between concentration and bank profitability.

Asset Composition Regressions

Table 7 presents regression in which the dependent variable is the (transformed) ration of loans to assets, LA_ cox. In 7.1 we see that the measure is negatively and significantly related to both HHI measures at about the one percent confidence level. Regression 7.2

adds the county clustering procedure, but this seems to have little effect on confidence intervals. Regression7.3 employ the GMM procedure. Notably in this case the coefficients of HHI0 and HHI100 remain negative and their significance levels increase to extremely high levels.

To summarize, these results suggest that more concentrated bank markets are ceteris paribus associated with lower bank commitment to lending as opposed to holding other assets such as bonds. The empirical findings seem robust, and are supported by many other regressions using different specifications that, for brevity are not presented

B. Results for The International Sample

Table 8 reports definitions of variables and some sample statistics for banks and macro - economic variables. There is a wide variation of countries in terms of income per capita at PPP (ranging from US$440 to US$21,460) as well as in terms of bank size. Here, the Z-score at each date is defined as Zt= (ROAt + Eat)/σ (ROAt), where t ROA is the return on average assets, tEA is the equity -to- assets ratio, and ( ) ı 1 ı t t t t σ ROA = ROA – T - ∑ ROA. When this measure is averaged across time, it generates a cross –sectional series whose correlation with the Z- score as computed previously is about 0.89.The median Z is about 19.It exhibits a wide range, indicating the presence of both banks that either failed (negative Z) or were close to failure (values of Z close to 0) as well as banks with minimal variations in their earnings with very large Z values.

We computed HHI measures based on total assets, total loans and total deposits. The median asset HHi is about 19, and ranges from 391 to the monopoly value of 10,000. The correlation between the HHis based on total assets, loans and deposits is very high, ranging from 0.89 to 0.94.

Table 9 reports correlations among some of the bank and macroeconomic variables. The highest correlation is between the HHI and GDP per capita. This correlation is negative (-0.30) and significant at usual confidence levels, indicating that relatively richer countries have less concentrated banking systems. This is unsurprising, since GDP per

capita can be viewed as a proxy for the size of the banking market. As before, we present regressions in which the Z-score, its components and the ratio of loans to assets are the dependent variables. We estimate versions of the following panel regression:

$$Ijt\ iijjjt\ 1jt\ 1ijt\ 1ijt \qquad XαIαIβHHIγyδZε − −−= \sum \square \ +\sum++++$$

where ij X is the Z-Score ,the Z-score components ,or the loan –to-asset ratio of bank i in country j,i I and j I are bank i dummy and country j dummy respectively ,j HHI is a Hirschman –Hirfendahl Index in county j, j Y is a vector of country –specific controls ,and ij Z a vector of bank –specific controls. Two specifications are used. The first is with country fixed effects, the second is with firm fixed effects. The HHI, the macro variables and bank specific variables are all lagged one year so as to capture variations in the dependent variable as a function of pre-determined past values of the dependent variable.20

In these regressions, the vector of country –specific variables jt Y includes GDP growth and inflation, which control for cross- country differences in the economic environment and GDP per capita and the logarithm of population, which control for differences in relative and absolute size of markets (countries), as well as supply and demand conditions for banking services. We also control for the exchange rate of domestic currency to the US dollar, since bank assets are all expressed in dollar terms. Firm variables ij Z include the logarithm of total assets, which controls for the possible existence of scale (dis)economies, and the ratio of no-interest operating costs to total income, which controls for differences in banks cost efficiency.

Z-Score Regressions

In Table 10 we present a set of regressions in which the Z-score is the dependent variable. Regressions 10.1 and 10.2 regress the Z- score against the HHI, In both cases, the co-efficient of the HHI. In both cases, the coefficient of the HHI index is negative and highly significant. Regressions 10.3 and 10.4 are the same as 10.1 and 10.2 except that they include country specific macro-economic variables. The addition of these variables

does not change the relationship between the Z-score and HHI, which remains negative and highly significant.

Regressions 10.5 and 10.6 are the same as 10.3 and 10.4 bank size and the cost- to –income ratio as additional control variables. Again, the HHI coefficient remains negative and highly significant. Indeed, the negative relationship is even stronger, since with the addition of firm –specific controls the coefficient associated with HHI increases in absolute value relative to the specifications without firm specific controls (10.2).

Remarkably larger banks exhibit higher insolvency risk, as the coefficient associated with bank size is negative and highly significant 21. This is the same result obtained for sample of U.S and other industrialized country large banks obtained by De Nicolo (2000) for the 1988-1998 period and consistent with the international regression in De Nicolo et al. (2004). Thus, the positive relationship between bank size and risk of failure seems to have been a feature common to both developed and developing economies in the past two decades.22

The bottom panel of Table 10 reports the estimated coefficients of loans and deposit HHI's for each of the regressions described. While results are similar to those using the asset HHI, the negative effect on the Z- score of changes in HHI are stronger when concentration is measured on deposits rather than on loans. However, the fact that the co-efficient of asset HHI is the largest and always highly significant suggests such a measure may better capture competitive effects related to all bank activities, rather than those related to deposit –taking and loan- making activities only.

In sum, as in the U.S. sample, these results suggest that more concentrated bank markets are ceteris paribus associated with greater risk of bank failure.

Regressions Of Z- Score Components

Similarly to what was done previously Table 11 reports regressions of the components of the Z-score at each date as dependent variables: returns on assets (ROA), the (transformed) ratio of equity capital to assets (EA. cox) and the (log- transformed) volatility of earnings, Ln (σ (ROA)).

ROA does not appear to be related to the asset –based HHI, but it is positively and significantly related to both the loan-based and deposit-based HHIs, as in the U.S sample 23 Capitalization is negatively and significantly associated with concentration as well as with bank size. The volatility of ROA is also strongly positively correlated with the HHI in the country fixed effects regressions although the significance of the co-efficient drops in the firm fixed effects regressions. These results suggest that primarily differences in capitalization, and secondarily differences in the volatility of ROA, are the main drivers of the positive relationship between concentration and the Z-score measure of banks risk of failure .24

Asset Composition Regressions

The relationship between concentration and asset composition is summarized in Table 12, which reports regressions with the (transformed) ratio of loans to assets as the dependent variable. The coefficients associated with each measure of HHI are negative and highly significant in all specifications. Consistent with the prediction of both theories previously described, loan- to - asset ratios tend to be lower in more concentrated markets.

Concentration and Profits

As we have shown previously, theory predicts that the relationship between the number of competitors and bank profit, or bank profits scaled by assets need not be monotonic in a Cournot –Nash environment. Virtually all existing empirical work in banking has used scale profitability measures as dependent variables (profit /assets/profit/equity. etc.)

Yet, since profits and assets may be decreasing in concentration at different rates. It is entirely possible that profits and scaled profits could behave differently. A full empirical investigation of non-monotonic and possibly discontinuous relationship between concentration and profits is beyond the scope of this study. The international sample exhibits a positive and statistically significant relationship between concentration and profits in all specifications. Overall, these results suggest a monotonically increasing relationship between concentration and bank profits.

CHAPTER - 5

RESEARCH METHODOLOGY

A Research methodology defines the purpose of the research, how it proceeds, how to measure progress and what constitute success with respect to the objectives determined for carrying out the research study. The appropriate research design formulated is detailed below.

Exploratory research: This kind of research has the primary objective of development of insights into the problem. It studies the main area where the problem lies and also tries to evaluate some appropriate course of action. The research methodology for the present study has been adopted to reflect these realties and help reach the logical conclusion in an objective and scientific manner. The present study contemplated exploratory research.

Nature of Data

Primary Data: Data which is collected through direct interviews and by raising questionnaires. For the present study, the primary data shall be collected through structured questionnaires, personal interviews /discussions with focus on his/her choice before availing for the service.

Secondary Data

Secondary data that is already available and published. It could be internal and external source of data. Internal source: Which originates from the specific field or area where research is carried out e.g. Publish broachers, official reports etc. External source: This originates outside the field of study like books, periodicals, journals, newspapers and the Internet. Secondary data will be collected through the following sources: -

- Articles
- Reports
- Journals

- Magazines
- Newspapers
- Internet

SAMPLE DESIGN: Purposive Random Sampling. Samples shall be taken based on previous knowledge of the population (from which the samples are taken) and the specific purpose of the study or investigation.

Sampling unit: a. Financial Experts
b. Bank Executives
c. Customers

Sample size: 100

Research Location: New Delhi, India

Research Period: Three months

Research Constraints:

- Geographical Limitation:
- Busy Schedule of the experts, brokers and the officials.

OBJECTIVES OF THE STUDY

The present study revolves around the following broad objectives:

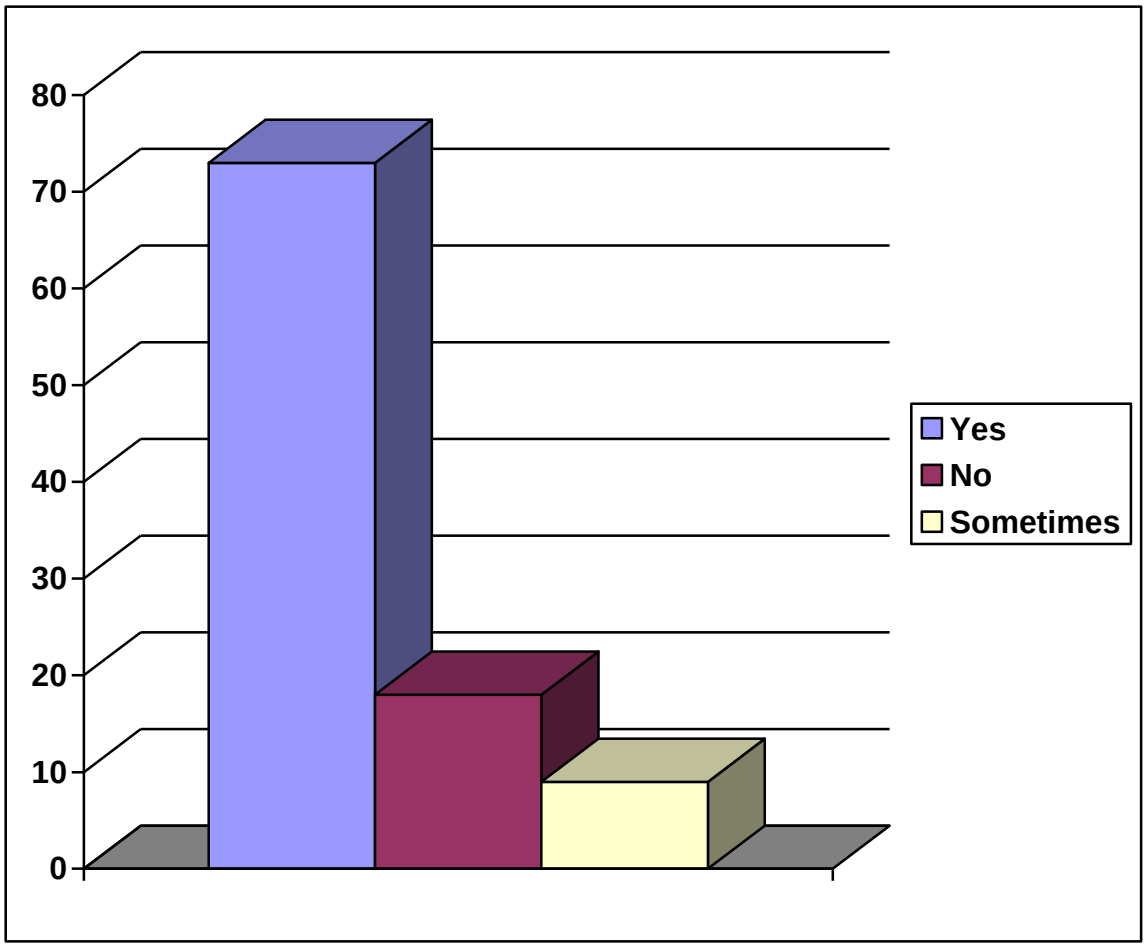
- To understand the concept of risk management in the banking sector and the concept of credit risk.
- To study the credit risk management strategy in the Indian banking sector.
- To study the credit risk management policy of the Yes Bank.

CHAPTER - 6

DATA ANALYSIS

1. Are you aware about the concept of Credit Risk in the Banking Sector?

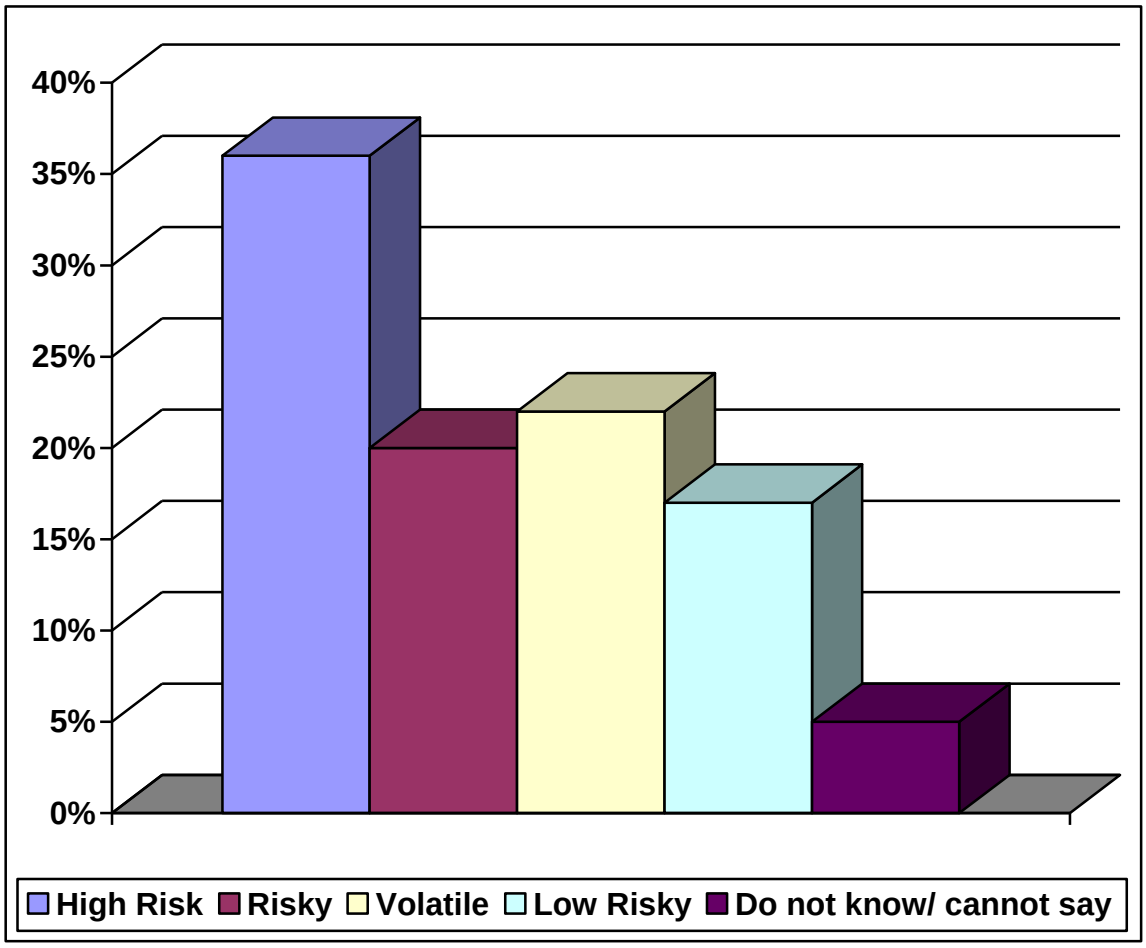
Yes	73%
No	18%
Sometimes	9%



Inter pretention: The awareness level among the officials regarding the existence of credit risk in the banking sector appears to be comfortable at 73 per cent.

2. How would you characterize the credit risk level in the private banking sector in India?

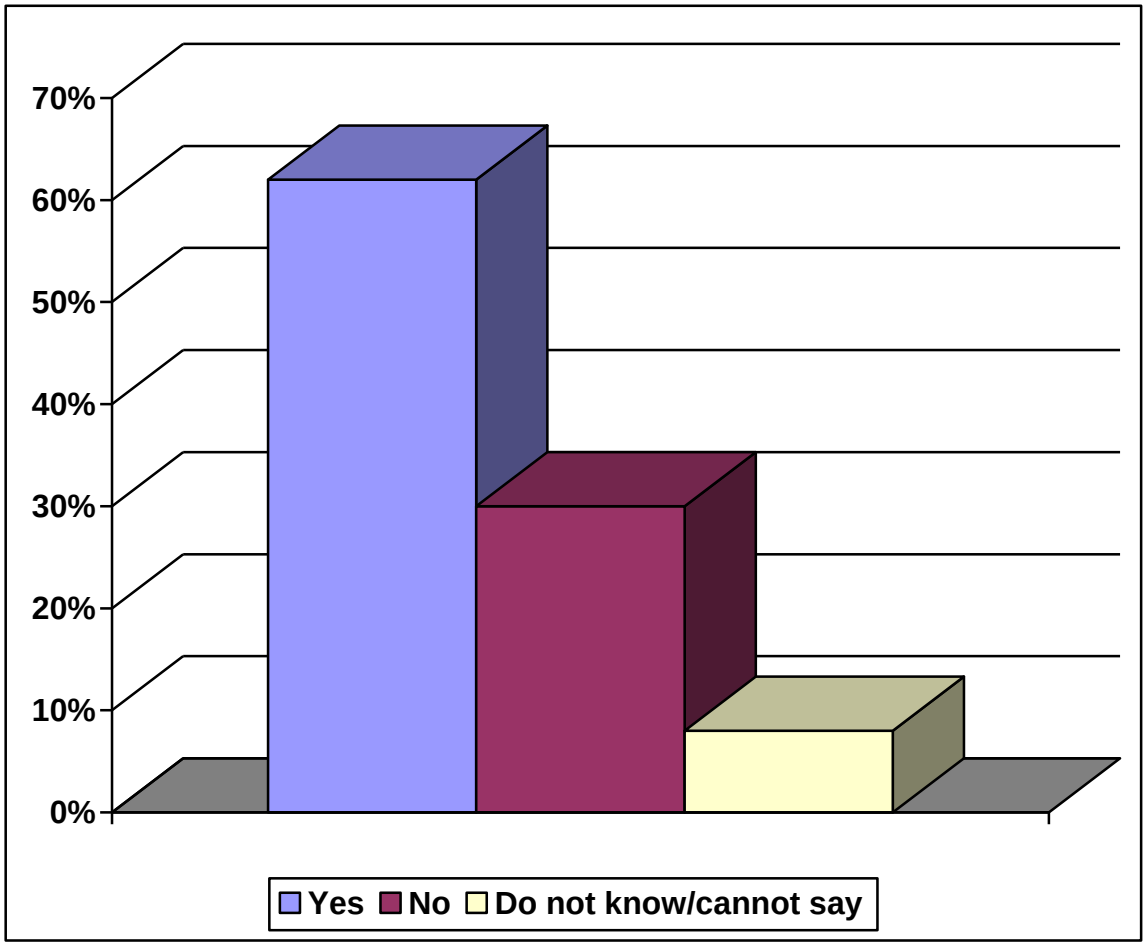
High Risk	36%
Risky	20 %
Volatile	22 %
Low Risky	17%
Do not know/ cannot say	05%



Interpretation: The risk factor appears to be on higher side as far as the Indian private sector banking is concerned. However, the degree of risk varies, if we go by the respondent's view.

3. Does the Basel Accord helps in reducing the credit risks of the private commercial banks in India?

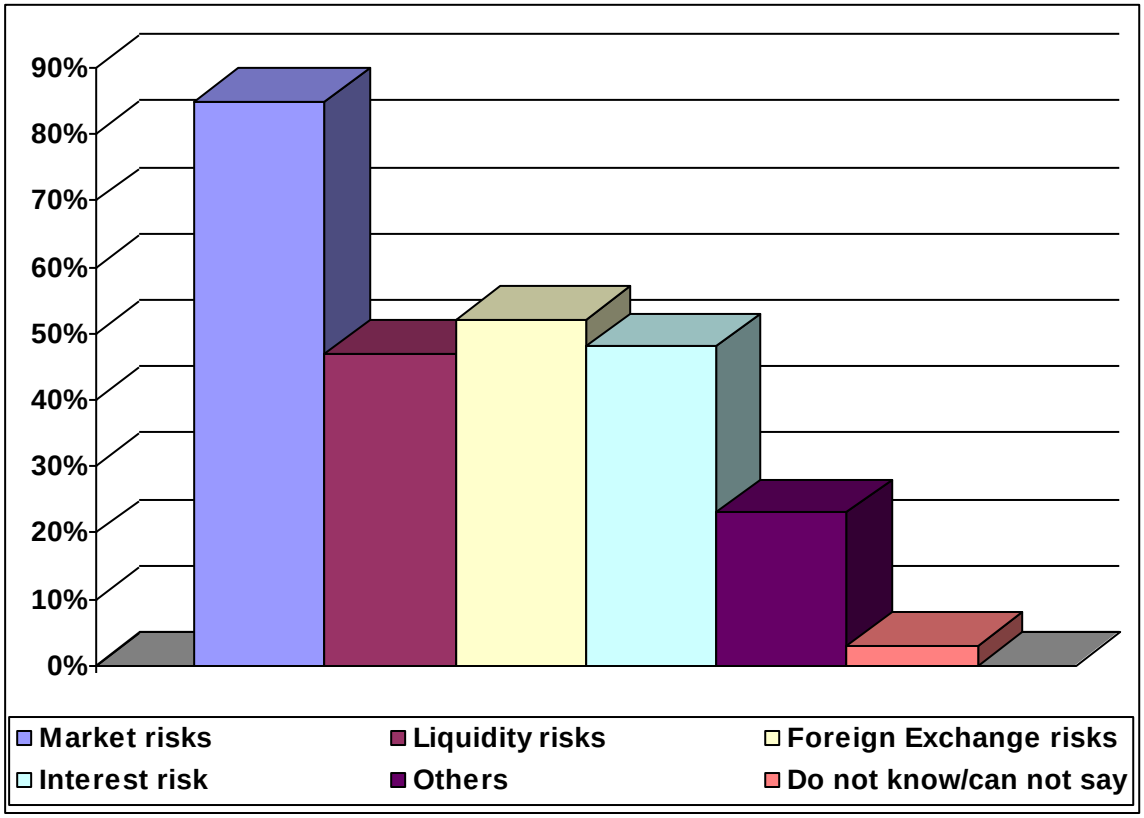
Yes	62%
No	30 %
Do not know/cannot say	08%



Interpretation: The BASEL accord helps considerably in reducing the credit risks suffered by the private commercial banks in India.

4. Apart from credit risk, what are other risk to which your bank is exposed to? You can choose more than one options

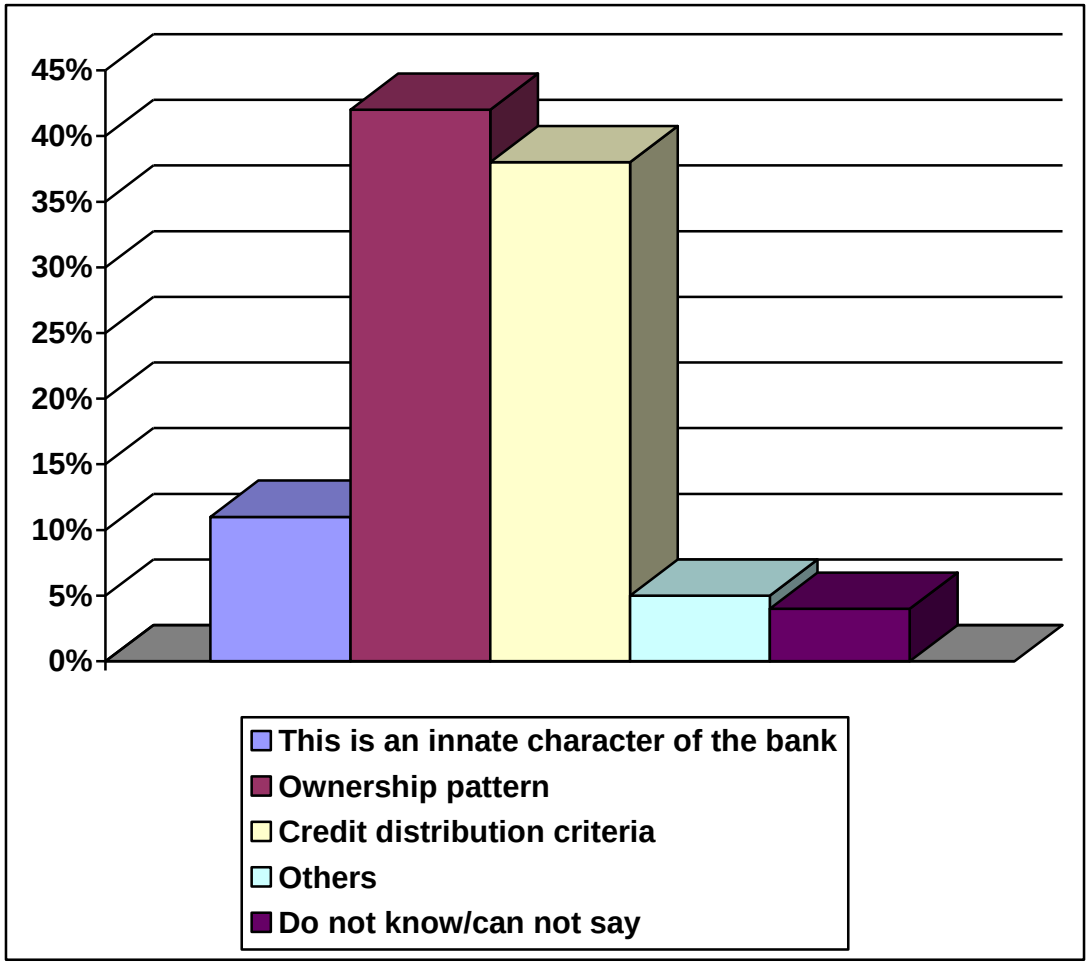
Market risks	85%
Liquidity risks	47%
Foreign Exchange risks	52 %
Interest risk	48%
Others	23%
Do not know/cannot say	03 %



Interpretation: Banks will have to take charge of the major area of risk management for their own survival and growth. To cope up with these changes in the external environment and to meet the internal requirement, banks have to develop skills for managing newer types of risks, market risks, interest rate risks, foreign exchange risks, liquidity risks, in addition to traditional credit risks.

5. What are the reasons for credit aversiveness of your bank?

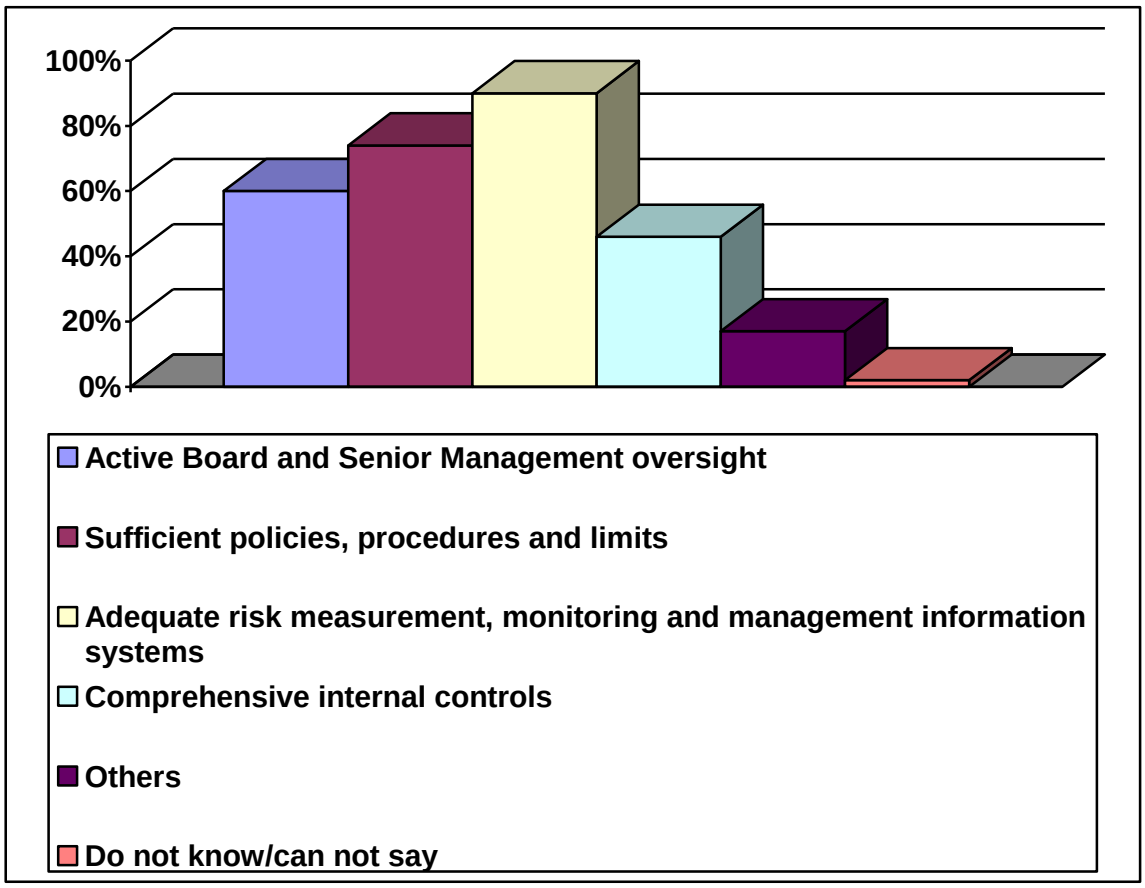
This is an innate character of the bank	11%
Ownership pattern	42%
Credit distribution criteria	38%
Others	05%
Do not know/cannot say	04%



Interpretation: Ownership pattern and the credit distribution criteria and ratio are effective factors that influence the credit aversiveness of the bank

6. What are the key components of the credit risk management system of your bank?

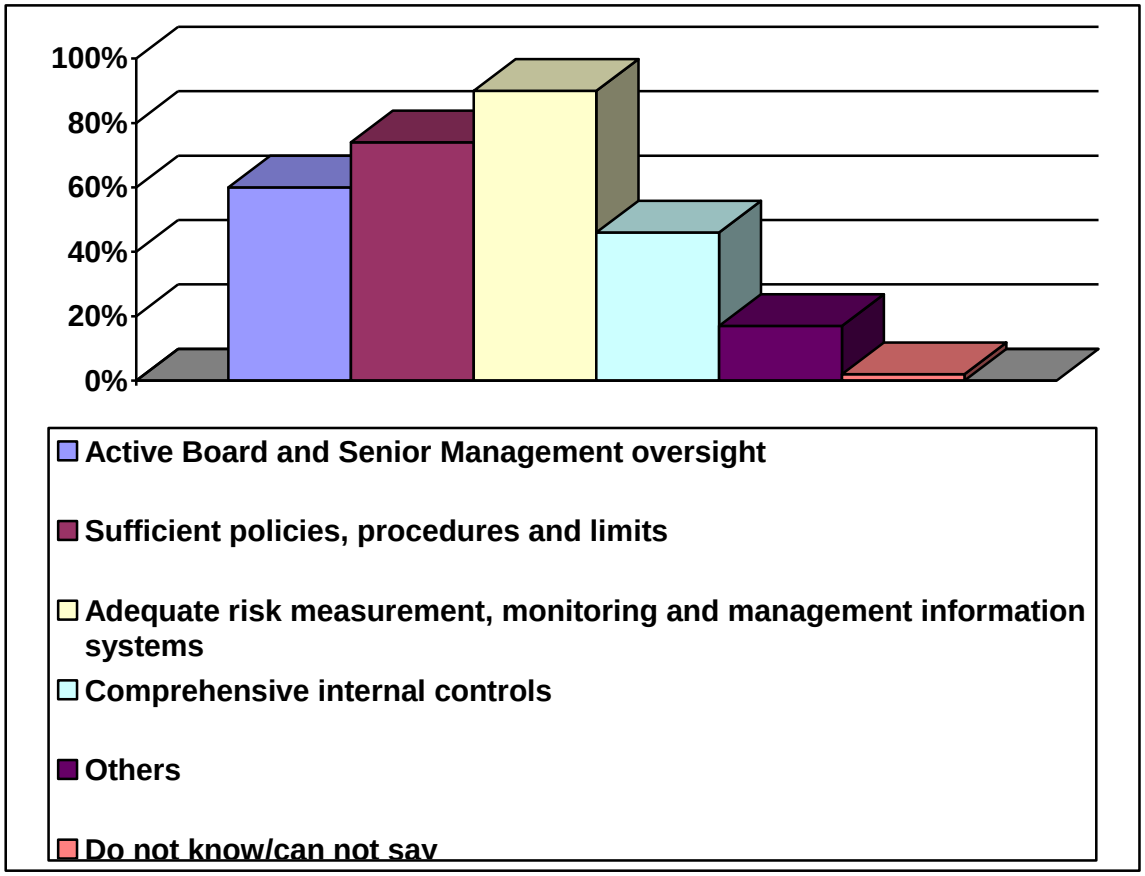
Active Board and Senior Management oversight	60%
Sufficient policies, procedures and limits	74%
Adequate risk measurement, monitoring and management information systems	90%
Comprehensive internal controls	46%
Others	17%
Do not know/cannot say	02%



Interpretation: Adequate risk measurement and management system accompanies with effective policies and management controls are the basic mechanisms for the credit risk system of the bank.

7. Do you agree that technology plays an important role in the credit risk management system of your bank?

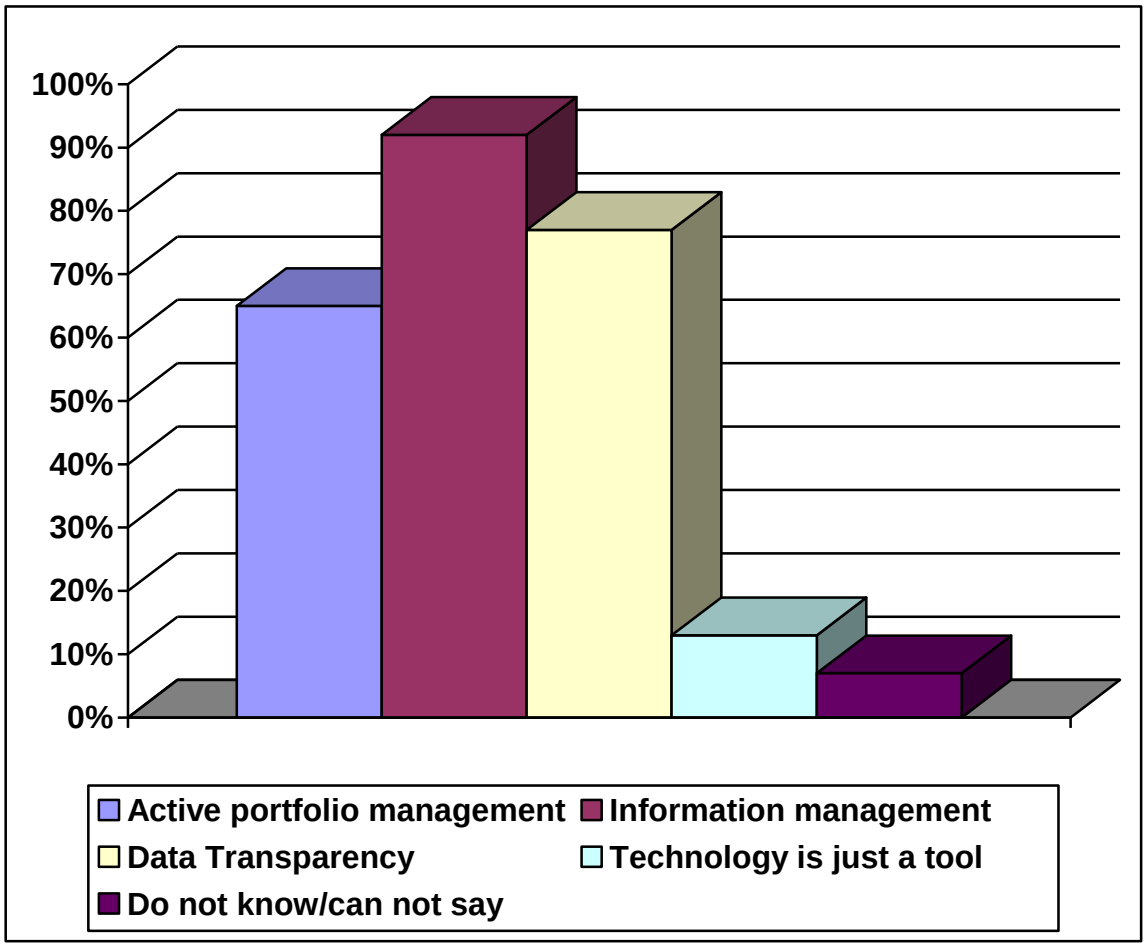
Strongly Agree	34%
Agree	42%
Disagree	15%
Strongly Disagree	08%
Do not know/cannot say	01%



Interpretation: Technology plays an important role in the credit risk management system of your bank.

8. What role do technologies play in the credit risk management of the bank?

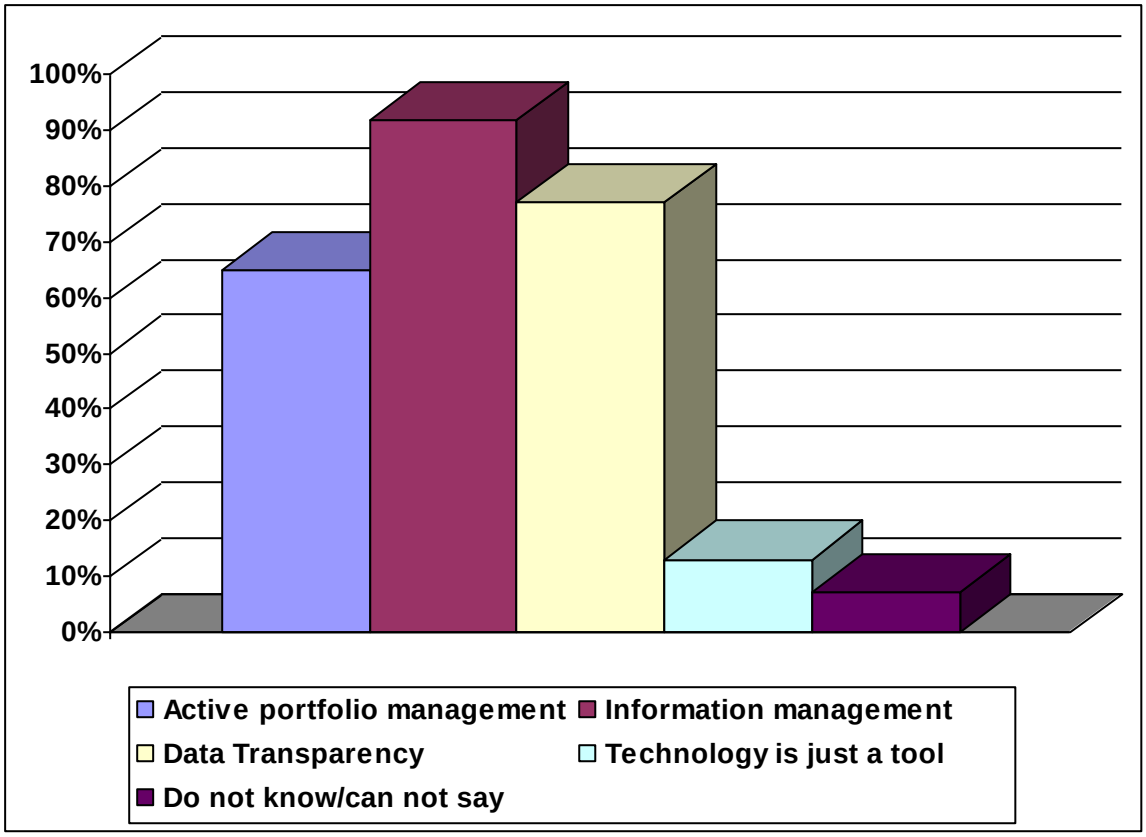
Active portfolio management	65%
Information management	92%
Data Transparency	77%
Technology is just a tool	13%
Do not know/cannot say	07%



Interpretation: As far as credit risk management is concerned, technology helps in data transparency, information management and active portfolio management of the customers in the bank.

9. Do you agree that integrating market risk and credit Risk into a single risk management system will help to minimize the credit risk of the bank?

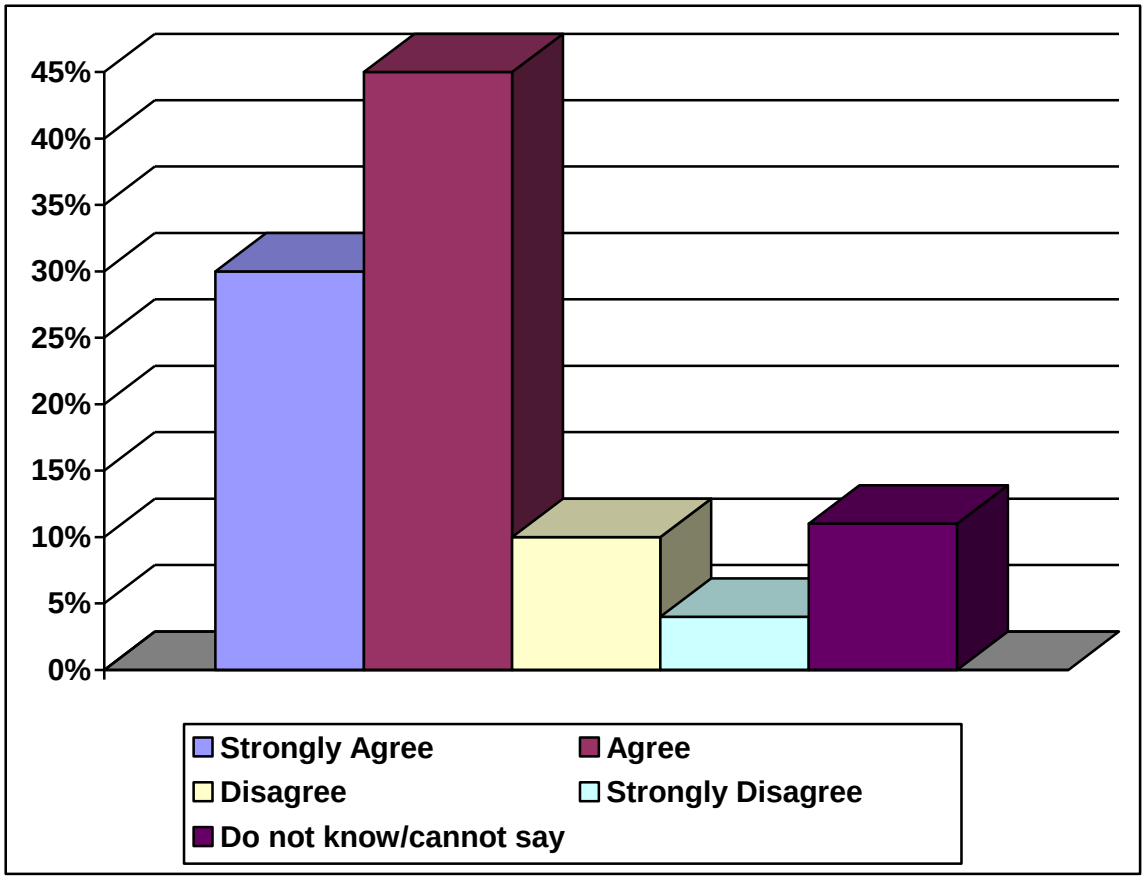
Strongly Agree	36%
Agree	50%
Disagree	07%
Strongly Disagree	04%
Do not know/cannot say	03%



Interpretation: Integrating market and credit risk into a single risk management system will ultimately be cheaper and more productive than maintaining separate market and credit risk systems. It also enhances the decision-making process and allows banks to better adhere to current "best practice" guidelines and emerging regulations thus making regulatory reporting a far simpler task.

10. Do you agree that an effective credit risk management system can be a value enhancing system for your bank?

Strongly Agree	30%
Agree	45%
Disagree	10%
Strongly Disagree	04%
Do not know/cannot say	11%



Interpretation: If deployed correctly and effectively, credit risk management can be a value enhancing activity that goes beyond regulatory compliance and can provide a competitive advantage to institutions that execute it appropriately.

CHAPTER - 7

CONCLUSION

Today, the focus for many banks is to adopt an enterprise credit risk management approach as it gives an integrated view of risk. Best practice in credit risk management should demonstrate centralization, standardization, timeliness, active portfolio management and efficient tools for managing exposures. This is encouraged by the pressure from regulatory requirements such as Basel II. By constantly enhancing existing tools and methods, banks are able to work towards achieving best practice in credit risk management.

India's financial system is undergoing a major transformation. Market driven environment, de-regulation –led volatility in interest rates, increasing competition, deteriorating quality of portfolio, dwindling funding support from government and discerning and demanding investors and shareholders have made the institutions and banks realize the need for refined and structured risk management system to survive and succeed. Information system and database are to be further strengthened and risk management skills need up gradation to the higher plane of advanced risk management techniques through focused training. Risk management is gradually turning from intuitive to systematic but still remains largely as a defensive strategy to hedge or mitigate risk; it would need to emerge as a coherent process to optimize risk and return.

In the current scenario, banks are constantly pushing the frontiers of risk management. Compulsions arising out of increasing competition, as well as agency problems between management, owners and other stakeholders are inducing banks to look at newer avenues to augment revenues, while trimming costs. Consolidation competition and risk management are no doubt critical to the future of banking.

Yes bank has the tools, insights and expertise to help our clients use credit risk management to maximize customer profitability and sustain shareholder value. Facing increasing shareholder demands, they have helped more than 200 leading organizations improve their credit risk management process and realize true benefits such as a reduction in net bad debt, operational cost savings and a decline in customer churn.

Our theoretical analysis considered two models: the CVH model, which follows for competition only in deposit markets and where there is no contracting problem between banks and borrowers and the BDN model, which allows for competition in both deposit and loan markets and where banks solve an optimal contracting problem with their borrowers. We showed that the prediction of the CVH model is that risk of failure is strictly increasing in the number of firms. With the BDN model, on the other hand the risk predictions are opposite: risk of failure is strictly decreasing in the number of firms.

With regard to asset allocations both models make similar predictions. The equilibrium loan –to –asset ratio will be increasing in the number of firms N, at least when N becomes "sufficiently large".

Our empirical tests imply two different samples of banks with very different sample attributes. Our risk measure is a Z-score, our asset allocation measure is the ratio of loans of assets, and our measure of competition is the HHI computed in a variety of ways. First, we examined the relationship is negative, meaning that more competition (lower HHI) is ceteris paribus associated with a lower probability of failure (higher Z-score). This finding is consistent with the prediction of the BDN model, but inconsistent with the prediction of the CVH model.

Next, we examined the relationship between competition and asset composition, represented by the loan to assets ratio. Both theoretical models predict that this relationship will be positive, at least for sufficiently large N. In the empirical tests with both samples, we found a positive and significant relationship.

We draw three main conclusions. First there exist neither compelling theoretical arguments nor robust empirical evidence that banking stability decreases with the degree of competition. Theoretically, that result depends on a particular model specification (CVH) and can easily be reversed by adopting a different specification (BDN). Nor do the data support such a conclusion. Using two large bank samples with very different properties, we found a positive relationship between competition and bank stability. To us this suggests that positive or normative analyses that depend on CVH –type models should be re-examined.

Second, both the theory and the data suggest a positive ceteris paribus relationship between bank competition and willingness to lend (as opposed to hold government bonds). This is potentially important because it means there is another dimension that policy makers might consider when evaluating the costs and benefits of competition in banking. We know of no previous work on this relation and obviously more needs to be done. If our results hold up, however, the policy implication is obvious – and favors more as opposed to less competition in banking.

Third, reasonable models of imperfect competition in banking do not necessarily predict that profits or scaled measures of profitability will be monotonically decreasing in the number of competitors. Therefore, when empirical tests do not find a monotonic relationship it is unclear what can be made and it would be appropriate to conclude from such tests that one measure of competition or another is a "bad measure". Theory has provided no clear standard for such judgments.

In terms of future work, we believe that modeling efforts should focus on extending contracting –type models of banking. Important extensions include modeling the issuance of bank equity claims and bank debt, and possibly doing that in a general equilibrium frame work.

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ANNEXURE

Questionnaire

1. **ARE YOU AWARE ABOUT THE CONCEPT OF CREDIT RISK IN THE BANKING SECTOR?**

   - YES---------- 73 percent
   - No----------18 percent
   - Do not know----------09 percent

2. **HOW WOULD YOU CHARACTERIZE THE CREDIT RISK LEVEL IN THE PRIVATE BANKING SECTOR IN INDIA?**

   - High Risky----------36 percent
   - Risky----------20percent
   - Volatile----------22 percent
   - Low Risky---------- 17 percent
   - Do not know/Cannot say----------05 percent

3. **DOESNOT THE BASEL ACCORD HELPS IN REDUCING THE CREDIT RISKS OF THE PRIVATE COMMERCIAL BANKS IN INDIA?**

   - Yes---------- 62percent
   - No----------30percent
   - Do not know/cannot say----------08percent

4. **APART FROM CREDIT RISK, WHAT ARE OTHER RISKS TO WHICH YOUR BANK IS EXPOSED TO? YOU CAN CHOOSE MORE THAN ONE OPTIONS.**

   - Market risks---------- 85 percent
   - Liqidity risks---------- 47 percent
   - Foreign Exchange risks----------52 percent
   - Interest risk----------48 percent
   - Others----------23 percent
   - Donot Know/Cannot say----------03 percent

5. **WHAT ARE THE REASONS FOR CREDIT AVERSIVENESS OF YOUR BANK?**

- This is an innate character of the bank---------- 11 percent
- Ownership patter---------- 42 percent
- Credit distribution criteria---------- 38 percent
- Others----------05 percent
- Do not know /Cannot say----------04 percent

6. **WHAT ARE THE KEY COMPONENTS OF THE CREDIT RISK MANAGEMENT OF YOUR BANK?**

- Active Board and Senior Management oversight--------- 60 percent
- Sufficient policies, procedures and limits----------74 percent
- Adequate risk measurement, monitoring and management information system—
  ----------90 percent
- Comprehensive internal controls----------46percent
- Others----------17percent
- Do not know/Cannot say---------- 02 percent

7. **DO YOU AGREE THAT TECHNOLOGY PLAYS AN IMPORTANT ROLE IN THE CREDIT RISK MANAGEMENT SYSTEM OF YOUR BANK?**

- Strongly Agree---------- 34 percent
- Agree---------- 42 percent
- Disagree----------15 percent
- Strongly Disagree----------08 percent
- Do not know/Cannot say----------01 percent

8. **WHAT ROLE DO TECHNOLOGY PLAY IN THE CREDIT RISK MANAGEMENT OF THE BANK?**

- Active portfolio management---------- 65 percent
- Information management----------92percent
- Data Transparency----------77percent
- Technology is just a tool---------- 13 percent
- Do not know/Cannot say---------- 07 percent

9. **DO YOU AGREE THAT INTEGRATING MARKET RISK AND CREDIT RISK INTO A SINGLE RISK MANAGEMENT SYSTEM WILL HELP TO MINIMIZE THE CREDIT RISK OF THE BANK?**

   - Strongly Agree----------36 percent
   - Agree----------50 percent
   - Disagree----------07 percent
   - Strongly Disagree----------04 percent
   - Do not know/Cannot say---------- 03 percent

10. **DO YOU AGREE THAT AN EFFECTIVE CREDIT RISK MANAGEMENT SYSTEM CAN BE A VALUE ENHANCING SYSTEM FOR YOUR BANK?**

    - Strongly Agree----------30 percent
    - Agree----------45 percent
    - Disagree----------10 percent
    - Strongly Disagree----------04 percent
    - Do not know/Cannot say---------- 11 percent

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