Chapter 4

4 Review Of Literature

There does not seem to be an attempt made earlier to study the Enterprises, viz the Industrial Units and Trading houses, based in the North Eastern India, with respect to their Credit Rating. However whatever related Literature I could get hold of through my research on the Internet, particularly the websites of NIBM, Pune, IIMs Ahmedabad, Kolkata, Bangalore, and others, I have tried to review the same.

4.1 A Note on Measurement and Management of Credit Risk under Basel II

- Dr. Arindam Bandyopadhyay (Ph. D, M. Phil, M. Sc.) arindam@nibmindia.org

The monograph discusses relevant issues regarding tools to measure and manage credit risk in the banking sector especially in the Indian context. It portrays issues in the 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 roadmap to improve risk management culture in banks.

The monograph is divided into following six comprehensive segments:

I. Various credit rating models and many methods for estimation of PD

II. Validation and calibration of rating models
III. Quantification of EAD and LGD

IV. Portfolio approach of measuring economic capital

V. Risk Adjusted Performance Measurement Framework (RAPM) and Risk Based Profitability Analysis (RAROC based lending strategy and capital allocation)

VI. Evolution of Basel II and implementation plan for Indian banks including estimation of IRB regulatory capital estimation and explanation of formulas

This monograph also addresses some other crucial aspects relevant for Indian banks like:

I. Minimum requirements for IRB approach and conformity of NIBM’s credit rating models

II. Implications of Basel II on the Indian banking sector and stress testing of credit risk

The topics covered in the monograph are unique and first of its kind in India. This monograph would help the academicians / practitioners / risk managers / top executives alike in banks to understand the nuances of credit risk management including modern tools in identifying, evaluating credit risk and its implications on profits and business strategies.

4.2 Bankers' Credit Decisions

- Sampat P Singh NIBM Pune.

This is a book on Banker's credit Decisions. It is made up of two parts. Part one contains six chapters dealing with Credit Decisions, Working Capital Management, Norms of Lending, Loans versus Cash Credit System, Tools for
Financial Analysis and the Case Method. These concepts have to be understood and then applied in the analysis of the cases. Part two is comprised of ten cases. The first nine cases are built around three types of conflicts: Bankers' interest versus borrowers' interest; credit need versus credit risk; and the business mode versus the bureaucratic mode. The last case is focused on loan pricing and decision based on customer profitability analysis.

Financial analysis has often times been viewed as an alternate to judgment and pragmatism. Bankers' decision has also been mistaken as a binary choice between yes and no resulting in the neglect of behavioral aspect of the decision process. This book attempts a more balanced approach. With improved educational profile of new generation bankers, growth of foreign and private sector banks, and greater autonomy to public sector banks, it is hoped that a more balanced and more efficient approach to credit decision will be adopted by the banks. This book provides the necessary academic support.

4.3 Calibrating asset correlation for Indian corporate exposures

Implications for regulatory capital

Arindam Bandyopadhyay, Tasneem Chherawala and Asish Saha - National Institute of Bank Management (NIBM), Pune, India

This paper is a first attempt to empirically calibrate the default and asset correlation for large companies in India and elaborate its implications for credit risk capital estimation for a bank. The authors estimate default probabilities and default correlations of long-term bonds of 542 Indian corporate using rating transitions and pair-wise migrations over ten year cohorts of firms. Further, the
implicit asset correlation from the estimated default correlations and default thresholds are derived using the asymptotic single risk factor approach.

The authors find evidence that default correlations are time variant and vary across rating grades and industries. The highest correlations are observed between companies within the same rating grades (systematic risk impact) and within the same industry (industry specific impact). More interestingly, significantly smooth monotonic relationship between the probability of default (PD) and asset correlation as prescribed by the Basel II IRB document (2006) are not found. Moreover, it is found that the asset correlation range for Indian corporates do not match with what is prescribed for corporate exposures by BCBS.

4.4 Understanding the Effect of Concentration Risk in the Banks' Credit Portfolio: Indian Cases

*Arindam Bandyopadhyay National Institute of Bank Management (NIBM), India July 2010*

Credit Concentration Risk has been the specific cause of many occurrences of financial distress of banks worldwide. This paper analyzes the credit portfolio composition of a large and medium sized leading public sector Bank in India to understand the nature and dimensions of credit concentration risk and measure its impact on bank capital from different angles. In evaluating the bank wide measures in managing concentration risk, the author has demonstrated how economic capital approach may enable the bank to assess the impact of regional, industry and individual concentration. They have also shown how
portfolio selection can be done through correlation, stress tests, marginal risk contribution vis-à-vis risk adjusted return that will enable the top management to manage portfolio concentration risk and accordingly plan its capital.

4.5 Empirical estimation of default and asset correlation of large corporates and banks in India

Arindam Bandyopadhyay National Institute of Bank Management (NIBM), Pune, India, and Sonali Ganguly, National Institute of Bank Management (NIBM), Pune, India

Estimation of default and asset correlation is crucial for banks to manage and measure portfolio credit risk. The purpose of this paper is to find empirical relationship between the default and asset correlation with default probability, to understand the effect of systematic risk. The authors have estimated single default and implicit asset correlations for banks and corporates in India and compare it with global scenario. This paper deduces a simple methodology to estimate the default correlations from the variance of temporal default rates.

Next, the asset correlations have been estimated analytically by decomposition of variance equation in Merton’s one factor risk model following approaches of Gordy and of Bluhm and Overbeck.

The authors empirically find a negative relationship between asset correlation and the probability of default using Moody’s global corporate data that support Basel II internal ratings-based (IRB) correlation prescription. However, they do not find any smooth relationship between the probability of default (PD) and asset correlation for Indian corporate. The magnitude of correlation estimates based on a large bank’s internal rating-wise default rates are much lower than
what is prescribed by the Basel committee. Thus, the standardized correlation figures as assumed by the Basel Committee on Banking Supervision need to be properly calibrated by the local regulators before prescribing their banks to calculate IRB risk weighted assets.

These correlation estimates will help the regulators, insurance firms and banks to understand the linkage between counterparty default risks with the systematic factors. The findings of this paper could be used further in estimating portfolio economic capital for large corporate.

4.6 Firm size and corporate financial-leverage choice in a developing economy: Evidence from Nigeria

Author(s): Ahele Fhele Ezeoha, (Department of Banking and Finance, Faculty of Management Sciences, Ebonyi State University, Abakaliki, Nigeria)

The purpose of this paper is to investigate, from an undeveloped market perspective, the nature and significance of firm size as a determinant of corporate financial leverage.

A panel data fixed-effects regression model is used to estimate the relationship between financial leverage and firm size, while controlling also for the effects of other acclaimed determinants like asset tangibility, profitability and firm age. The dataset used covers 71 firms quoted in the Nigerian stock markets over a 17-year period (1990-2006).
The study reveals that as much as 91.4 percent of the total finances of Nigerian-quoted firms are of short-term liabilities, with just 8.6 percent constituting long-term liabilities. It finds that firm size is negatively and significantly related to financial leverage.

Controlling for some other determinants, the arising results tend to confirm an over-bear-ing influence of the pecking order theory in the financing patterns of Nigerian-quoted firms – by revealing that the relationship between profitability and financial leverage is highly significant and negative; and that firm-age is positively and significantly related to financial leverage.

Using data from a country with undeveloped and inefficient financial markets, this paper provides an important insight on the international debate on the effects of size on corporate decisions.

4.7 Defining and measuring business risk in an economic-capital framework

Authors: (Rene Doff, Twente University, Enschede, The Netherlands Eureko, Zeist, The Netherlands)

The objectives of this paper are to: define business risk; identify whether economic capital could be used to mitigate this risk; and investigate business-risk measurement methodologies.

The paper analyzes definitions used in theory and practice and derived a definition. It analyzes three measurement methodologies: analogue companies/peer group analysis, statistical methods, and scenario analysis. These methodologies are tested against the criteria of effective management
control, because economic capital is increasingly used as a management control instrument.

Economic capital can be used as business-risk mitigant albeit not the only one. The measurement methodology of scenario analysis satisfies most of the criteria for effective control.

This paper opens a discussion to further develop the scenario approach in theory and practice.

Despite the amount of economic capital that financial institutions hold to cover business risk, it has received little attention in literature.
4.8 Operational drivers affecting credit risk of mutual guarantee institutions

Author(s): Lorenzo Gai, (Department of Business and Economics, University of Florence, Florence, Italy), Federica Ielasi, (Department of Business and Economics, University of Florence, Florence, Italy)

The purpose of this paper is to investigate the drivers influencing the risk of default on mutual guaranteed loans. The authors aim to verify whether default is influenced by the specific business policies of mutual guarantee institutions (MGIs) and to recommend guidelines for directing their operating management.

The authors analyse the guaranteed portfolios of 19 Italian MGIs and investigate the determinants of the defaulted positions at the end of June 2011. The sample consists of 167,777 guaranteed loans, of which 11,349 are in default. Using regression models, the variables related to the business model of MGIs that are significantly associated with default on their positions have been identified by the authors.

The defaulted positions of MGIs are significantly correlated with the type of issued guarantees. This condition should be considered in defining product and price policies.

The authors identify some critical issues in the risk-taking processes of MGIs. The tested hypothesis highlights the opportunities for the optimization of guaranteed loan portfolios, which is necessary for reducing the profitability/liquidity pressures of these financial institutions and enhancing their
efficiency as instruments for mitigating the effects of credit rationing and promoting the revitalization of small-and medium-sized enterprises.

The results are based on an original and reserved dataset, which is not available in public financial statements or public statistics, but is collected directly from the MGIs that are part of the study.

4.9 Forecasting bank credit ratings

Author(s): Periklis Gogas, (Department of Economics, Democritus University of Thrace, Komotini, Greece), Theophilos Papadimitriou, (Department of Economics, Democritus University of Thrace, Komotini, Greece), Anna Agrapetidou, (Department of Economics, Democritus University of Thrace, Komotini, Greece)

This study aims to present an empirical model designed to forecast bank credit ratings using only quantitative and publicly available information from their financial statements. For this reason, the authors use the long-term ratings provided by Fitch in 2012. The sample consists of 92 US banks and publicly available information in annual frequency from their financial statements from 2008 to 2011.

First, in the effort to select the most informative regressors from a long list of financial variables and ratios, the authors use stepwise least squares and select several alternative sets of variables. Then, these sets of variables are used in an ordered probit regression setting to forecast the long-term credit ratings.

Under this scheme, the forecasting accuracy of the best model reaches 83.70 percent when nine explanatory variables are used.
The results indicate that bank credit ratings largely rely on historical data making them respond sluggishly and after any financial problems are already known to the public.

4.10 Models for predicting default: towards efficient forecasts

Author(s): Fernando Castagnolo, (Citigroup, London, UK), Gustavo Ferro, (Instituto de Economía UADE, Universidad Argentina de la Empresa and CONICET, Buenos Aires, Argentina)

The purpose of this paper is to assess and compare the forecast ability of existing credit risk models, answering three questions: Can these methods adequately predict default events? Are there dominant methods? Is it safer to rely on a mix of methodologies?

The authors examine four existing models: O-score, Z-score, Campbell, and Merton distance to default model (MDDM). The authors compare their ability to forecast defaults using three techniques: intra-cohort analysis, power curves and discrete hazard rate models.

The authors conclude that better predictions demand a mix of models containing accounting and market information. The authors found evidence of the O-score’s outperformance relative to the other models. The MDDM alone in the sample is not a sufficient default predictor. But discrete hazard rate models suggest that combining both should enhance default prediction models.

The analysed methods alone cannot adequately predict defaults. The authors found no dominant methods. Instead, it would be advisable to rely on a mix of methodologies, which use complementary information.
Better forecasts demand a mix of models containing both accounting and market information.

The findings suggest that more precise default prediction models can be built by combining information from different sources in reduced-form models and combining default prediction models that can analyze said information.

4.11 Concentration risk model for Greek bank's credit portfolio

Author(s): Constantinos Lefcaditis, (Department of Public Administration, Panteion University of Social & Political Sciences, Athens, Greece), Anastasios Tsamis, (Department of Public Administration, Panteion University of Social & Political Sciences, Athens, Greece), John Leventides, (Section of Mathematics and Informatics, Department of Economics, University of Athens, Athens, Greece)

The IRB capital requirements of Basel II define the minimum level of capital that the bank has to retain to cover the current risks of its portfolio. The major risk that many banks are facing is credit risk and Basel II provides an approach to calculate its capital requirement. It is well known that Pillar I Basel II approach for credit risk capital requirements does not include concentration risk. The paper aims to propose a model modifying Basel II methodology (IRB) to include name concentration risk.

The model is developed on data based on a portfolio of Greek companies that are financed by Greek commercial banks. Based on the initial portfolio, new portfolios were simulated having a range of different credit risk parameters. Subsequently, the credit VaR of various portfolios was regressed against the credit risk indicators such as Basel II capital requirements, modified Herfindahl
Index and a non-linear model was developed. This model modifies the Pillar I IRB capital requirements model of Basel II to include name concentration risk.

As the Pillar I IRB capital requirements model of Basel II does not include concentration risk, the credit VaR calculations performed in the present work appeared to have gaps with the Basel II capital requirements. These gaps were more apparent when there was high concentration risk in the credit portfolios. The new model bridges this gap providing with a correction coefficient. The credit VaR of a loan portfolio could be calculated from the bank easily, without the use of additional complicated algorithms and systems.

The model is constructed in such a way as to provide an approximation of credit VaR satisfactory for business loan portfolios whose risk parameters lie within the range of those in a realistic bank credit portfolio and without the application of Monte Carlo simulations.

4.12 Re-modeling of risk management in banking: evidence from the sub-continent and gulf

Author(s): Ahmad Raza Bilal, (Department of Management and Human Resource Development, Universiti Teknologi Malaysia, Johor Bahru, Malaysia), Noraini Bt. Abu Talib, (Department of Management and Human Resource Development, Universiti Teknologi Malaysia, Johor Bahru, Malaysia), Mohd Noor Azli Ali Khan, (Department of Management and Human Resource Development, Universiti Teknologi Malaysia, Johor Bahru, Malaysia)

The main purpose of this study is to investigate the remodeling of risk management, risk-averse mechanism and the importance of Basel-III framework to cope with the current financial challenges in the regime of post
global financial crises of 2008-2011 by evidences in the banking sectors of emerging economies of Bahrain, the UAE and Pakistan.

To ensure deep understanding in this cross-cultural study, two fold data collection techniques are used; one through distribution of questionnaires to relevant staff members and second through personal interviews of selected risk officials. Respondents are selected on the basis of minimum five years banking experience and relevant professional education of finance or risk management. Multistage sampling technique is used for data collection. To ensure the consistency from respondents, personal interviews were conducted with an interval of six months after receipt of questionnaires. Various statistical and econometric techniques were used to test the study hypotheses and to satisfy the study objectives.

Based on statistical analysis and personal surveys, research findings concluded that banking sectors of study-countries have deep concern with potential risk challenges and they are in continuous process to improve risk measurement framework in accordance with the latest regulatory obligations. All three types of banks have clear understanding of RM practices and strong relationship is observed between predictors and endogenous variables. Respondent banks of study-countries have deep attentiveness to manage all key risks and they recommend to transform existing regulatory framework including Basel-III reforms to develop a more comprehensive “one-size-fits-all” regulatory framework to cover loopholes of existing financial system.
This study is limited to the findings of remodelling of risk management to cope with the new financial challenges for the banking sector. Empirical investigation is conducted in emerging economies of the sub-continent and gulf and evidences are obtained from the UAE, Bahrain and Pakistan. Following this research model, future research can be extended to enlarge the sample size, by including other regional countries or a comparison between eastern and western countries to make it more useful to understand the risk management strategies, minimize banking default risks and to make this significant economic sector more strengthen.

Respondent countries of this study are fast growing and emerging economies of the sub-continent and gulf. Results of this cross-cultural study are likely to be beneficial for credit analysts, bankers and academic researchers. Findings are also beneficial for local and international business investors while they are taking prudent investment decisions in respective capital markets.

This is the first comparative study to empirically investigate the RM practices and risk-averse mechanism in banking sectors of Bahrain, the UAE and Pakistan. In perspective of study-countries, a critical analysis on risk-averse mechanism and Basel-III regulatory implications is demonstrated in this study.

4.13 Differences in the risk management practices of Islamic versus conventional financial institutions in Pakistan: An empirical study

Author(s): Owais Shafique, (Management School, University of Liverpool, Liverpool, UK and Department of Management Sciences, The Islamia University of Bahawalpur, Bahawalpur, Pakistan), Nazik Hussain, (Department of Management Sciences, The Islamia University of
The purpose of this paper is to provide an insight into the differences in the risk management practices of Islamic financial institutions (IFI) and conventional financial institutions (CFI) in Pakistan.

The study makes use of primary data collection method using a questionnaire survey. Literature review discovered that the types of risks faced by both types of financial institutions can be classified under six categories. The research concludes that credit risk, equity investment risk, market risk, liquidity risk, rate of return risk and operational risk management practices in IFI are not different from the practices in CFI. Whereas the overall risk management practices of IFI and CFI are alike in Pakistan.

The paper opens our eyes to the fact that much is unknown about the risk management practices in Pakistani financial system, creating a need for empirical studies for further discoveries to formulate better frameworks and to prevent an impending financial crisis. This study is expected to expand the existing literature by providing novel empirical evidence.

4.14 Small businesses and risk contingent credit

Firms facing significant income volatility can often suffer from downside risk such that return on assets is insufficient to meet fixed financial obligations. The purpose of this paper is to provide a prescriptive credit solution for small businesses facing exogenous income risk.

Formulas for risk-contingent operating and collateralized loans are developed and simulated in the context of a specific business sector.

The paper demonstrates that a structured credit product with an imbedded option can reduce or eliminate financial risks by providing payouts that decrease the amount of principal and/or interest that firms must repay under low income states.

The authors are unaware of any commercial financial products of the type considered in this paper and thus their approach is a prescriptive solution to the identified problem.