Chapter 1:

Introduction

1.1 Theoretical Framework

In the last ten to twenty years, financial markets have evolved significantly in wake of financial liberalization. They are more globally focused now with continuous evolvement more complex products. In many areas, market activities have become increasingly concentrated in a handful of very large firms. In other areas, the role of smaller more specialized entities has also grown significantly. In wake of such complexities, from a policy perspective, there is no clear consensus on whether the financial system today is more or less vulnerable to systemic disturbances than it was in 1990s. The global scale of large banks, securities firms and some major investors has expanded the channels which can transmit systemic risk across the globe. Moreover, several of the most significant financial market disturbances of the past, like the events of 1997 and 1998 involving currency crises in several Asian countries, the Russian debt default, the collapse of the Long-Term Capital Management hedge fund, the disturbances in payment and settlement arrangements following operational disruptions resulting from the terrorist attacks of 11th September 2001, have become
significantly important in its implication. These have exposed, to a large extent, relatively fragile macroeconomic conditions of global financial market, in prudential risk management perspective. It is further compounded with the tremendous growth in use of financial derivatives, which has increased tradability of financial risk. As a whole, the financial market, globally, has become increasingly exposed to newer kind of financial risk with their inherent complexities.

As a consequence, the Regulators have prudently driven the risk management agenda in recent years, in particular, through the introduction of Basel II for banks, Solvency II for insurance companies and Undertakings for Collective Investment in Transferable Securities (UCITS) for asset managers. As the global implementation process for Basel II has evolved slowly, the time is appropriate for the financial institutions to re-evaluate the contribution the risk management makes to the business as a whole. The risk managers are more inclined to maintain regulatory capital rather than internally built economic capital. The gap between the role played by the regulatory-focused role by the risk manager and value-focused future agenda for the risk manager is the known truth. Economic capital and other advanced risk-based capital methodologies enable financial institutions to quantify the risks they face, the capital needed to cover them and the real risk-adjusted returns that are being made. In that framework, risk-based capital management can help organizations to identify threats and
weaknesses, pinpoint opportunities that may be missed by the competitors, and target investment where it can earn its best return. This can also facilitate to align risk appetite with capital allocation and communicate the tangible strengths and potential of the business to analysts, investors and rating agencies. However, risk-based capital management is only as good as the reliability of the data, validity of the assumptions and quality of model application that underpin it, which precisely give scope for prudent and validated risk measurement and management practices. In this context, the relevance of advanced risk measurement and management techniques comes into play, which should proactively be implemented by Indian Banks and other financial institutions in the context of liberalization, consequent capital adequacy and income recognition guidelines by Reserve Bank of India and strategic alignment with the global financial market.

This paper aims at pinpointing the applicability of the advance risk measurement techniques, with relevant empirical study in Indian financial market, from a holistic global perspective of advanced quantitative risk measurement methodologies, which are being upgraded continuously by the academicians and practitioners across the globe.

1.2 Importance and Objective of the study

The concept of risk management goes back to the 1960’s and the 1970’s where it was used to address property and casualty
contingencies. More recently, risk management has become a comprehensive management process for the identification, analysis, measurement and control of various kinds of risks: market, credit and operational, including the regulatory aspect, organizational and structural matters. This means that risk management is vital for monitoring risky activities or investments; managing potential problem areas; and endorsing appropriate procedures. Any business activity is subject to risk and the standard finance theory defines risk as the “dispersion of unexpected outcomes due to movements in financial variables” (Jorion\(^1\), 2001). Risk is comprised of two components - uncertainty and exposure and is embedded in any business wherein add on risk means the “volatility of unexpected outcomes, generally the value of assets or liabilities of interest.”(Jorion\(^2\), 2001). This defines risk as the outcome of financial loss resulting from a risk factor such as, interest rates, exchange rates; commodity prices, and so on. The financial institutions and the economy as a whole are exposed to risks that change over time due to systematic and unsystematic risk events. The use of risk management has been promoted by the rapid expansion of a largely unregulated derivatives market trading in billions of dollars, and the heightened concern about the spread of leverage and derivatives, wherein a case in study is the $1.4 billion


\(^2\) ibid.
credit loss of Bank of America. Derivatives dealers are now promoting the use of financial risk management to hedge against market risk, which is why derivatives instruments are sometimes referred to as “risk management products” (Holton, 2002). Moreover there is a need for “global centralized risk management” due to exposure to new types of risks and the increased volatility of trading such products (Jorion, 2001). A more pertinent example that illustrates the complexity of financial risk management is the collapse of Enron in December 2001 as a result of management underestimation of the risks involved in derivatives trading. The relevance comes into play for building the prudent effect risk measurement and management process enterprise wise. This process involves risk modeling to identify and realize underlying risk factors, and modeling of their dynamics, then the quantification and significance of their influence on the portfolio value. The final step in this process is making informed decisions about the likely risk exposure. Likewise, it needs to be made clear that managing risk does not mean reducing risk; a key insight of risk management is to quantify and control risk. Hedging is an alternative; another might be to change the risk profile in response to market conditions. Value at risk based risk management system offers protection against market risks by measuring and quantifying financial risk. Nowadays the

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5 Enron is a US Energy Corporation.
rapid expansion of global financial markets requires the identification, measurement and pricing of various risks.

Risk management in today’s business organization is crucial for the reporting, overseeing and segregation of various duties within institutions. There have continuous evolvement of risk-based regulations like Basel II for banks, Solvency II for insurance companies and UCITS for asset managers. In post-Basel II scenario, there is an acute necessity for risk measurement and risk management in financial Institutions worldwide including India who is in rapid convergence with global financial markets in post-liberalization mode. The objective of this study is to evaluate the applicability of sophisticated risk measurement models in Indian context, with relevant empirical studies thereof, in the conformity with wide gamut of research continuously made by the numerous academicians and the practitioners around the globe for prudent and effective risk management purpose.

1.3 Organisation of the study

Our work focuses on the risk quantification practices study in Indian financial market with application of latest statistical tools as implemented and proposed by the academicians and the practitioners worldwide for risk prudential risk measurement and management, in line with the growing high regulatory standards and best practices. The chapter 1 gives introduction as to our approach to risk measurement on our paper along with objective and organisation of
study. The chapter 2 describes the evolution of Risk Regulations including Basel II and the evolution of Bank for International Settlement. The chapter 3 gives the brief review of the huge researches undertaken around the globe in respect of risk measurement techniques. The chapter 4 describes in brief the methodologies used in the subsequent section of empirical studies. The chapter 5 consists of the empirical study with use of advanced value at risk models with consequent back testing of the model, applied to the leading stock index of a prominent stock exchange of India. The chapter 6 consists of the empirical study with validation method of credit rating model in an Indian bank. The chapter 7 consists of the empirical work with application of Peaks Over Threshold (POT) method of Extreme Value Theory, in evaluating the movement of tails of extreme returns which is not quantified by other conventional risk quantification models, applied to a leading stock of a prominent stock exchange of India. The chapter 8 summarises the dissertation with concluding remarks.