

*Abstract of Doctoral Dissertation*

## **Estimation and Applications of some Risk Measures in Finance<sup>1</sup>**

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### **I. Introduction**

A MAJOR CONCERN for the regulators and owners of financial institutions is the market risk of a portfolio consisting of risky assets, e.g. a stock market index or a mutual fund, and the adequacy of capital to meet such risk. Market risk is the risk of losses in positions arising from the movements in market prices. The financial disasters of the early 1990s incurred by several institutions such as Orange County, Procter and Gamble and NatWest, through inappropriate derivatives pricing and management, as well as fraudulent cases such as Barings Bank and Sumitomo, have brought risk management and regulation of financial institutions to the forefront of policy making and public discussions. In a financial market, a risk measure is used to determine the amount of capital to be kept in reserve. The purpose of this reserve is to make the risks taken by financial institutions, such as banks and insurance companies, acceptable to the regulator. Some of the well known measures of market risk are: Value-at-Risk (VaR), Median Shortfall (MS) and Expected Shortfall (ES). VaR is an extreme quantile of the marginal loss distribution. Its use was recommended by the Basel Committee on Banking Supervision in 1996 and has been widely used by financial institutions for asset management and minimization of risk. MS is the median loss when the loss in the investment exceeds the VaR level. ES is the mean of the conditional loss distribution, given the event that the loss exceeds the VaR. In this thesis we study the problems of estimation of these risk measures based on asset or portfolio return data, and their applications in comparing the market risk of a wide variety of Indian mutual funds.

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