Preface

In the present aura of capital market changes, the development of techniques and theories of portfolio selection so far has postulated attainment of a single objective. Since, in the present state of emerging stock market activity, while times and need change, so may the preferences of investor groups change and the technique and/or theory of portfolio selection decisions developed so far, postulating a single goal would be of little relevance.

The rapid growth of the voluminous literature on portfolio selection is indicative of widespread interest both among academic and business communities. The path breaking works of Nobel Laureates Harry Markowitz, William F. Sharpe and Robert C. Merton has evoked a serious interest of researchers globally in this field. The possibility of earning high returns by investing in equity portfolio is accompanied by high return variability. However, managing this risk–return paradox by incorporating multi-objective criteria has largely remained unexplored in current academic literature and hence provides the rationale for undertaking research in this field. Using multi-objective portfolio selection criteria, an investor is able to choose a "satisficing" portfolio within a range of efficient portfolios lying in the feasible region. Therefore, there

is a need for developing a technique or theory of portfolio selection decision, postulating a multi-objective set.

The primary objective of this work is to develop and suggest multi-objective criteria to the problem of portfolio selection decision both under the conditions of certainty and uncertainty by making use of the potentials of the goal programming approach.

Investor profiling has been undertaken with the help of a self-constructed close-ended questionnaire for retail investors. This questionnaire has helped in recording the psychological evidence on perception of individual investors. This cognitive resource records response to the issues related to investor portfolio allocation, goals and constraints, macroeconomic factors, equity selection and demographics. This book presents techniques for undertaking individual investor's profiling and portfolio programming. While investor profiling analysis is statistical in nature, portfolio programming is more mathematical in orientation. Wherever possible, an attempt has been made to explain the concepts in a simplified manner.

Most of the individual investors were found to pursue multiple goals. Investors preferred investing in diversified equity mutual funds and seldom invested in index funds. The empirical study revealed that four factors, namely Timing of Portfolio, Security from Portfolio, Knowledge of Portfolio selection and Life Cycle Portfolio affect portfolio objectives. While Contingency Analysis [Chi-Square (χ^2) Test of Independence] revealed the independence/dependence of the five hypotheses relating portfolio variables such as gain sought, goals, constraints, macroeconomic factors, market capitalisation and demographics. The empirical analysis of the two questionnaires has helped in understanding the practical way of handling portfolio selection problems and in making some generalisations.

The resultant portfolios from goal programming portfolio selection model have been compared graphically in risk–return space with Markowitz's efficient frontier. Also, Sharpe ratio (Sp), Treynor ratio (Tp) and excess return to unsystematic risk ratio (VAp) have been used for comparing the resultant eleven portfolios from Bombay Stock Exchange (BSE) 30 Index. Quartile 3 (Q3)—Quartile 1 (Q1) Minimum Un-desirable deviation model performed well on account

of multiple goals attainment and diversification but minutely violated the budget constraint. Maximum Minimum exact goal achievement model formulation was found suitable for risk lovers. Goal programming portfolio selection model formulations were tested on monthly and annual data of 11 years (1.4.1999–31.3.2010) for securities part of BSE Sensex. The empirical results provide a solution to the multi-objective optimisation problem even while there were conflicting objectives and constraints. The goal programming model formulated and applied would be of immense help in selecting an optimum solution and would be very relevant particularly to Foreign Institutional Investors (FIIs), mutual funds and investors.

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http://www.springer.com/978-3-319-54415-1

Portfolio Selection Using Multi-Objective Optimisation

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2017, XX, 230 p. 21 illus., Hardcover
ISBN: 978-3-319-54415-1