

**ANALYSIS OF COLOMBO STOCK EXCHANGE AND BUILDING RISK
MINIMISED PORTFOLIOS THROUGH CAPITAL ASSET PRICING MODEL AND
MARKOWITZ PORTFOLIO THEORY**

Y.M. Manamperi*

*Department of Mathematics, Faculty of Science, University of Colombo, Colombo, Sri Lanka
milindamanamperi@gmail.com

Small to medium-range capital market investors in Colombo Stock Exchange (CSE) usually tend to invest without proper analysis, predominantly based on rumours by stock market manipulators. This study focuses on applying theoretical mathematical models (Capital Asset Pricing Model - CAPM and Markowitz Portfolio Theory - MPT) to manage investment portfolios and improve profitability even for retail investors. The main objectives of this study are to identify the beta value (which represents risk) for a company share through CAPM and build a risk minimised portfolio according to the investor's risk appetite while proving the concept of asset diversification through MPT. CAPM was applied to listed companies in CSE with share prices, All Share Price Index (ASPI) values, and government treasury-bill rate (risk-free rate). MPT was also applied with CSE data for selected two companies, and a share portfolio was created by plotting the efficient-frontier graph. The share portfolio represents the return fluctuation according to the risk, and an investor can select the minimised risk portfolio according to the Sharpe ratio. Risk-free assets (treasury bills) were included for the analysis by plotting the capital market line to further reduce the portfolio risk according to the investor's risk appetite. Findings of the CAPM study have shown the beta value for the selected share (2.16 for AEL.N) and can be used to find the expected return of the share. MPT study shows the importance of asset diversification to improve profitability according to the investor's risk appetite. Here the treasury-bill rate was assumed to be 0.5%. Weights of the optimised share portfolio (86% of AEL.N and 14% of GHLL.N) or risk-free asset included portfolio can be derived through the calculation. The investor's capital can be invested accordingly. These techniques can be applied to shares of all the listed companies and build a better portfolio according to the investor's risk appetite.

Keywords: Capital Asset Pricing Model, Efficient frontier, Markowitz Portfolio Theory, Risk appetite, Sharpe ratio