

Evaluating the Performance of Sectoral Optimal Investment using Second Order Stochastic Dominance

Amita Sharma* and Aparna Mehra

Department of Mathematics,

Indian Institute of Technology Delhi, Hauz Khas, New Delhi-110016, India

Email: amitaashrma.iitd@gmail.com

* Corresponding Author

Abstract

The research in portfolio optimization generally emphasized on optimal asset allocations to get maximum return (reward) with minimum risk (losses). But in almost all such studies the underline markets are considered on a whole and an asset performance is compared with all other assets listed in the market when constructing the optimal portfolio. However, it has long been observed that the economic environment of the industry in which a company operates hugely influences its stock performance. It is thus rational to think of creating dedicated funds for sectors rather than the individual companies. Moreover, the stock markets and investors across the globe are increasing looking for diversification and this can possibly be achieved by taking serious notes of changes in sectors than relying on the traditional ways of asset allocations.

In this paper we examine if the sectoral investment diversification can boost the chance of constructing a better performing portfolio with reduced risk. We propose a portfolio optimization scheme where we first construct a sectoral portfolio by optimally allocating budget to the best performing sectors. Here by sectors we mean clusters of companies within the stock market according to their similar functionality, for example FMCG (fast moving consumer goods), pharmaceutical (Health care) companies, banking and financial institutions, infrastructure, etc. And by sectoral portfolio optimization we mean to allocate budget to the sectors clusters in an optimal way instead to optimize the entire basket of assets in the market. Thereafter, in the next stage, we propose to design a portfolio comprising of those assets, within each allocated sector, which yield maximum return in the investment period. But then asset return is not the only parameter of its performance, we need to simultaneously take into account the associated investment risk. The strategy of investing in a sector may prove rewarding but its narrow focus on very few sectors can also make it highly risky. In the present work, we model risk by taking the second order stochastic dominance (SSD) criterion for optimal portfolios in both phases, be it sectoral optimization or within sector optimization.

The market of our study is the BSE S&P CNX 500. It comprises of 500 scripts and represents 93% of the total market capitalization listed in Bombay stock exchange, India, and the sample data is 6 years weekly return data from April 07-July 13.

We observed that the optimal portfolio obtained from our proposed optimization model (sectoral and then within sector) improved over the optimal portfolios from traditional mean-risk optimization model in terms of the Sharp ratio and the SSD criterion. Furthermore, while the portfolios from the traditional model require frequent rebalancing, the portfolios from our model are more long lasting with continuous good performance.

Keywords: Portfolio optimization; Sectoral investment; Second order stochastic dominance; Sharpe ratio; In-sample and out-of-sample analysis; Rebalancing