ENDE BUDI MULYADI. Optimization of Stock Portfolio at Indonesian Stock Exchange by Using Genetic Algorithm. Under Direction of PRAPTO TRI SUPRIYO and AGUS BUONO.

The selection process of investment portfolio comprise of the selection of investment that have high returns and determine its weight allocation. Determinations of stock weight allocation of shares that consist of millions of possible combinations with manual calculations require a long time and high accuracy. Furthermore, it is needed a tools to facilitate the optimizing process for selection of stock portfolio in the Indonesian capital market in order to easier for investors to determine stock portfolio. The aim of this research was to (1) design the genetic algorithm (GA) model to optimize the allocation of stock portfolio in the Indonesian capital market, (2) develop a prototype system for stock portfolio optimization by using GA. The data used were based on data published by the Indonesia Stock Exchange from January 2004 until December 2009. In order to facilitate the selection of stocks that have good performance, it is needed to groups the stocks in the LQ45 index. In addition, the company's financial condition and its growth prospects were another factor in the selection process. Furthermore, the stock prices be used as research data were the closing price of each month. The design of GA to optimize the stock portfolio was done by determine the components of GA including encoding scheme, fitness function, parent selection, crossover, mutation, elitism and population replacement. Thus, validation testing of the model to analysis the model that has been developed. Beside that, it will be tested the weight changes of the stock allocation at certain periods, to assess the implementation of portfolio rebalancing. The results showed that GA can be used as a tool in the preparation of an optimal stock portfolio. Stock portfolio allocation using adaptive GA method to generate the highest total profit compared with the market index or same weight methods.

Keywords: Stock portfolio, genetic algorithm, optimization, Indonesian stock exchange, investment