

## ABSTRACT

Multi-objective Genetic Algorithm NSGA-II is one of the evolutionary algorithm that is popularly used in multi-objective optimization problem that is to find Pareto optimal solution. In this final project research the Multi-objective Genetic Algorithm NSGA-II is used to solve the optimization problem of the stock portofolio of Indeks LQ45.

Some parameters used are size of population, maximum generation, probability of crossover, and probability of mutation. The final result of the Multi-objective Genetic Algorithm NSGA-II is a form of graph efficient frontier, where it is a set of the best options for the investor which offer the minimum level risk at a given expected return. The number of stock used in portfolio will influence the convergence of the Multi-objective Genetic Algorithm NSGA-II, the more number of stock used in portfolio will more difficult convergence. It can be seen from the result of performance algorithm that gives fairly good result for 5 to 10 stocks and defective for more than 10 stocks.

**Keywords:** *Multi-objective optimization, Stock Portfolio, Multi-objective Non-dominated Sorting Genetic Algorithm (NSGA-II)*