

Robust cryptocurrency portfolio optimization by using MNN and NNNPO

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Abstract

The more important the gain is for the investors, the more important the risk is. Therefore, the portfolio optimization is a major problem in the finance world. Harry Markowitz had proposed standard portfolio optimization method in 1952. In terms of dealing with the fitness function of the portfolio optimization model, solving this quadratic optimization problem is not that simple. In 2019, we proposed nonlinear neural network for portfolio optimization (NNNPO) which solves that complex problem for the standard portfolio optimization problem. Nowadays crypto assets more common than stock exchange market, but cryptocurrencies do not meet Markowitz's assumption which is assets have to be normally distributed. In this study, cryptocurrency data taken in to account between July 5, 2018 to July 4, 2019. Firstly, to evaluate a portfolio return for risk, information ratio, sharpe ratio, sortino ratio calculated. Secondly, to avoid normality assumption, robust parameters calculated. Thirdly, the forecasts obtained from multiplicative neural networks (MNN). Then, forecasted data taken into nonlinear neural network algorithm for portfolio optimization problem to determine the proportion of the currencies in the selected portfolio. Finally, the return of selected portfolio compared with the real cryptocurrency data.

Keywords

Nonlinear Neural Network, Robust Cryptocurrency Portfolio Optimization, Multiplicative Neural Networks

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