BROWN'S WEIGHTED EXPONENTIAL MOVING AVERAGE (B-WEMA) WITH LEVENBERG-MARQUARDT OPTIMIZATION TO FORECASTING RATE OF RETURN

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ABSTRACT

Infrastructure became the main program of the government that resulted in the construction of the role of the Indonesian economy. The construction sector is also believed to be unaffected by the political year. In fact, construction businessmen predict this sector will improve in 2018. One of the largest construction companies in Indonesia is PT Adhi Karya (Persero) Tbk. whose shares are corrected or called by buy on weakness. So investors can be in the bottom price, stock price down but potentially going up. n this paper, the authors will combine method of Weighted Moving Average and Brown's Double Exponential Smoothing. The combination of two methods called Brown's Weighted Exponential Moving Average (B-WEMA). The authors used 256 PT Adhi Karya (Persero) Tbk (ADHI.JK) stock closing data, taken daily from March 1st, 2017 to March 1st, 2018. The B-WEMA method will be compared with the Weighted Exponential Moving Average (B-WEMA) and Brown's Double Exponential Smoothing (B-DES) methods. Optimization of the alpha parameter with the Levenberg-Marquardt (LM) algorithm using the package library(minpack.lm) in software R is only done on the exponential smoothing model, namely in B-DES and B-WEMA. Optimization of alpha parameters on B-DES and B-WEMA respectively results in alpha parameter optimization values of 0.4420 and 0.4452. WEMA has MSE 3,337.4243 and MAPE 2.0270%, while B-DES has MSE 2,620.3177 and MAPE 1.7093%, and B-WEMA has MSE 2,606.4572 and MAPE 1.7057%. From the comparison of the three methods, it can be seen that B-WEMA is the best method because it has the smallest MSE and MAPE value. From the results of the best forecasting method is used to forecast the rate of return that yields a value of 0.6603%, 0.2544%, 0.2538% for next three periods with the average rate of return a value of 0.0809%. Which means during the investment year, investors get a profit of 0.0809% per day from the total funds invested in stock PT Adhi Karya (Persero) Tbk.

Keywords: Weighted Exponential Moving Average, Brown's Double Exponential Smoothing, Brown's   Weighted Exponential Moving Average, Optimization Levenberg-Marquardt, Rate of Return