

INTISARI

MODEL HYBRID GLOSTEN JAGANNATHAN RUNKLE GARCH DAN RADIAL BASIS FUNCTION NEURAL NETWORK (GJR GARCH-RBFNN) UNTUK PERAMALAN IHSG DI BURSA EFEK INDONESIA

Indah Puspita Sari

Abstrak: Masalah yang sering dihadapi dalam proses peramalan data *time series* bidang keuangan adalah masalah heterokedastisitas. Indeks Harga Saham Gabungan (IHSG) merupakan data *time series* di bidang keuangan yang memiliki karakteristik volatilitas tinggi dan varians yang tidak konstan (heterokedastisitas). Selain kondisi itu, terjadi pula masalah guncangan asimetris (*leverage effect*) dimana respon pasar lebih besar ketika *news* yang datang bersifat negatif daripada positif. Model *Glosten-Jagannathan Runkle* GARCH (GJR GARCH) merupakan model yang mampu mengakomodasi kondisi data tersebut. Lebih jauh lagi, pada fakta di kehidupan nyata kita seringkali dihadapkan dalam keadaan yang jauh lebih kompleks dimana satu model saja tidak mampu mengatasi keadaan tersebut secara maksimal. Sehingga pada penelitian ini dua buah model yaitu GJR GARCH dan RBF *Neural Network* digabungkan. Penggabungan tersebut dilakukan dikarenakan adanya asumsi awal bahwa model tunggal tidak mampu secara maksimal memodelkan karakteristik data *time series*. Dalam penelitian ini dilakukan peramalan IHSG periode 2014-2019 dan membaginya kedalam 5 kelompok data pengamatan. Alasan melakukan peramalan tersebut adalah karena IHSG merupakan salah satu faktor penting dalam menentukan keputusan investasi, dan dapat menggambarkan kondisi pasar serta dapat dijadikan benchmark dalam penilaian portofolio saham. Hasil peramalan menggunakan model gabungan GJR GARCH-RBF *Neural Network* tersebut menunjukkan performa atau tingkat keakurasian yang lebih baik dibandingkan model GJR GARCH secara individu pada seluruh kelompok data pengamatan. Hal ini tercermin dari nilai *Mean Square Error* (MSE) yang dihasilkan masing-masing model tersebut. Selain itu, diperoleh hasil peramalan nilai IHSG untuk 7 periode kedepan berturut-turut sebesar 6457.935, 6376.973, 6321.989, 6258.816, 6299.838, 6272.711 dan 6201.285.

Kata Kunci: Peramalan, IHSG, GJR GARCH, RBF *Neural Network*, MSE.

ABSTRACT

HYBRID GLOSTEN JAGANNATHAN RUNKLE GARCH AND RADIAL BASIS FUNCTION NEURAL NETWORK MODEL (GJR GARCH-RBFNN) FOR IHSG FORECASTING IN INDONESIA STOCK EXCHANGE

Indah Puspita Sari

Abstract: The problem that is often faced in the process of forecasting time series data in the financial sector is the problem of heterokedasticity. Composite Stock Price Index (IHSG) is a time series data in the financial sector that has characteristics of high volatility and variance that is not constant (heterokedasticity). In addition to these conditions, there is also the problem of asymmetric shocks (leverage effect) where the market response is greater when the news that comes is negative rather than positive. The Glosten-Jagannathan Runkle GARCH (GJR GARCH) model is a model that is able to accommodate the condition of the data. Furthermore, the facts in real life we are often faced with conditions that are far more complex where one model alone is not able to cope with these conditions to the full. So that in this study two models namely GJR GARCH and RBF Neural Network are combined. The merger is done because of the initial assumption that a single model is not able to optimally model the characteristics of time series data. In this study IHSG forecasting for the 2014-2019 period and dividing it into 5 groups of observational data. The reason for forecasting is because IHSG is an important factor in determining investment decisions, and can describe market conditions and can be used as a benchmark in assessing stock portfolios. Forecasting results using the combined GJR GARCH-RBF Neural Network model show better performance or level of accuracy compared to the GJR GARCH model individually on all groups of observational data. This is reflected in the value of Mean Square Error (MSE) generated by each of these models. In addition, IHSG forecasting results for the next 7 consecutive periods were 6457,935, 6376,973, 6321,989, 6258,816, 6299,838, 6272,711 and 6201,285.

Keywords: Forecasting, IHSG, GJR GARCH, RBF Neural Network, MSE.