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COMPARISON BETWEEN ARTIFICIAL NEURAL NETWORK AND AUTOREGRESSIVE INTEGRATED MOVING AVERAGE MODEL IN BITCOIN PRICE FORECASTING

(Perbandingan antara Rangkaian Neural Buatan dan Model ARIMA dalam Peramalan Harga Bitcoin)

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ABSTRACT

In this era of globalization, cryptocurrency is being created as one of the modern investment instruments and an alternative payment method. Many cryptocurrency has been created since the last decade, for examples Bitcoin, Litecoin, Peercoin, Auroracoin, Dogecoin and Ripple. The investment and usage of cryptocurrency is getting popular among the investors and consumers. Bitcoin is one of the most popular cryptocurrencies due to the low-cost-guaranteed transactions and its skyrocketed price. However, the price of Bitcoin depends on the consumers' and investors' speculation. The price volatility has caused losses to many investors. Two forecasting models, which are artificial neural network and the autoregressive integrated moving average (ARIMA) model will be used to forecast the price of Bitcoin. Comparison between the two models will be made and the most accurate model will be selected. Bitcoin price data dated from 1 January 2012 to 28 February 2018 is being used to build the forecasting models. The models will be used to forecast the price of Bitcoin in March 2018, and the predicted values will be used to compare with the actual values. Model building methods, pros and cons of the two models in forecasting will be discussed. Long-term and short-term forecasting will be carried out by using the two models. The suitability of each model in long-term and short-term forecasting will be discussed.

Keywords: cryptocurrency; non-linear autoregressive model; volatility

ABSTRAK

Dalam era globalisasi ini, mata wang digital telah muncul sebagai suatu instrumen pelaburan dan kaedah pembayaran moden. Pelbagai mata wang digital telah diwujudkan sejak sedekad yang lepas, antaranya Bitcoin, Litecoin, Peercoin, Auroracoin, Dogecoin dan Ripple. Pelaburan dan penggunaan mata wang digital semakin mendapat sambutan daripada para pelabur dan pengguna. Bitcoin adalah antara mata wang digital yang paling mendapat sambutan. Keadaan ini adalah disebabkan jaminan kos transaksi yang lebih rendah dan kenaikan nilai Bitcoin secara mendadak. Walau bagaimanapun, harga Bitcoin adalah bergantung pada spekulasi para pengguna dan pelabur. Ketidakstabilan harga Bitcoin juga merugikan banyak pelabur. Dua model peramalan, rangkaian neural buatan dan model autoregresi bersepadu purata bergerak (ARIMA) telah diperkenalkan untuk meramal harga Bitcoin. Perbandingan antara kedua-dua model peramalan dilakukan dan model yang paling tepat dalam peramalan harga Bitcoin telah ditentukan. Data harga Bitcoin dari 1 Januari 2012 hingga 28 Februari 2018 telah digunakan untuk membina model peramalan dalam kajian ini. Selepas model peramalan dibina, peramalan harga Bitcoin untuk bulan Mac 2018 dilakukan dan nilai peramalan akan dibandingkan dengan nilai sebenar. Kaedah pembinaan, kebaikan dan keburukan kedua-dua model dalam konteks peramalan juga dibincangkan dalam kajian ini. Dua jenis peramalan yang berbeza, iaitu, peramalan jangka masa panjang dan peramalan jangka masa pendek dijalankan dengan rangkaian neural buatan dan model ARIMA. Kesesuaian model dalam jenis peramalan yang berbeza turut dibincangkan

Kata kunci: mata wang digital; model autoregresif tak linear; kemeruapan

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