Universiti Teknologi MARA

Fuzzy Time Series and Geometric Brownian Motion in Forecasting Stock Prices in Bursa Malaysia

Nur Ezzati Dayana Binti Mohd Ramli

Report submitted in fulfillment of the requirements for
Bachelor of Science (Hons.) Management Mathematics
Faculty of Computer and Mathematical Sciences

June 2019

STUDENT'S DECLARATION

I certify that this report and the research to which it refers are the product of my own work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.

……

NIR EZZATI DAYANA BINTI MOHD RAMLI

2016329111

JUNE 21, 2019

ABSTRACT

Every country has its own stock market exchange, which is a platform to raise capital and is place where shares of listed company are traded. Bursa Malaysia is a stock exchange of Malaysia and it is previously known as Kuala Lumpur Stock Exchange. All over the world, including Malaysia, it is common for investors or traders to face some lost due to wrong investment decisions. According to the conventional financial theory, there are so many reasons that can lead to bad investment decisions. One of them is confirmation bias where an investor has a preconceived notion about an investment without a good information and knowledge. In this paper, we study the best way to provide good information for investors in helping them make the right decisions and not to fall prey to this behavioral miscue. Two models for forecasting stock prices data are employed, namely, Fuzzy Time Series (FTS) and Geometric Brownian Motion (GBM). This study used a secondary data consisting of AirAsia Berhad daily stock prices for a duration of 20 weeks from January 2015 to May 2015. The 16-weeks data from January to April 2015 was used to forecast the stock prices for the 4-weeks of May 2015. The results showed that FTS has the lowest values of the Mean Absolute Percentage Error (MAPE) and the Mean Square Error (MSE), which are 1.11% and $MYR^2 0.0011$, respectively. For comparison, for GBM, the MAPE is 1.53% and the MSE is $MYR^2 0.0017$. In addition, the foracasted stock prices by FTS are almost similar to the actual stock prices and the findings imply that the FTS model provides a more accurate forecast of stock prices.

TABLE OF CONTENTS

CHAPTER THREE: RESEARCH METHODOLOGY

CHAPTER FOUR: RESULTS AND DISCUSSIONS

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS