UNIVERSITI TEKNOLOGI MARA

COMBINING GEOMETRIC BROWNIAN MOTION MODEL AND MULTIPLE LINEAR REGRESSION MODEL FOR PREDICTING KIJANG EMAS SELLING PRICE

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ABSTRACT

Gold is widely known as the most valuable thing in this world which leads to the securing of gold as an investment portfolio among people. In making a profitable investment, it is extremely important to have an accurate decision on the buying and selling periods. Therefore, this paper attempts to analyze the appropriate forecast method for forecasting Malaysia's own gold bullion coin selling price namely Kijang Emas. The objectives of this research are to investigate the factors that affect the fluctuation of Kijang Emas gold prices, to develop forecasting model by using Multiple Linear Regression (MLR) method according to the factors that affect the Kijang Emas gold prices and to enhance the forecasting method by combining two individual methods, Geometric Brownian Motion (GBM) and MLR method. In order to improve the accuracy of the forecast, the combination of both forecast methods is proposed and it is done by using two combinations of forecasts methods; Simple Equal Weighted Average and Inverse Mean Square Forecast Error Combination method. Then, the forecast accuracy for each method is calculated by using Mean Absolute Percentage Error (MAPE) and the last result shows that the combination of forecast with Inverse Mean Square Forecast Error Combination method gives the lowest MAPE result. Hence, this method is highly recommended to be used in forecasting Kijang Emas selling price.

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IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL.

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Dedicated to my beloved parent,

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Yours Truly,

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INTRODUCTION

1.1 INTRODUCTION

Gold is one of the world's most valuable natural resources. It is indeed universally accepted for decades until now. It had been used as a monetary system before United States of America introduced the fiat paper money. The word gold is perhaps related to the Sanskrit word 'jvalita' which originates from the verb 'jval', means to shine since gold is the only yellow colour metal when in mass and in a state of purity as cited in Rose (1898). This shining metal can be categorized as a commodity and a pecuniary resource which is like money in feature but much more stable in terms of value (Tully & Lucey, 2007).

In terms of visual perception of gold, a distinguish difference of this metal is its golden yellow colour. From pure yellow golden colour, it can vary in multiple colours such as white, red, purple, dark brown and even black. The difference in colour depends on the combination of alloying metals to make diversification in jewellery production. For example, white gold can be gained by combining gold with nickel, palladium, platinum or iron since these metals are strong bleaches for gold (Corti, 2005).

The caratage of gold determines the content of gold. For example, 22 carat gold has 91.6% of pure gold and the other 8.4% consist of other metals such as aluminium, copper, zinc and iron whereas 24 carat gold is an original gold metal in its processed form. This 24 carat gold is not suitable for jewellery products or daily usage purpose as it is soft, flexible, and even delicate but is a favourite among the Chinese especially for wedding occasions (World Gold Council, 2012).

According to Oxford Dictionary Online (2012), carat means a unit for measuring how pure gold is or how heavy jewels are, whereas, the World Gold Council (2012) expresses the term carat in two parts. First as 'fineness' which