

An application of the Wilkie model in analysing share price index in Malaysia

Cite as: AIP Conference Proceedings 2016, 020095 (2018); <https://doi.org/10.1063/1.5055497>
Published Online: 27 September 2018

Nur Afiqah Mohamed Hafiz, Norizarina Ishak, and Ahmad Fadly Nurullah Rasedee



View Online



Export Citation

ARTICLES YOU MAY BE INTERESTED IN

[The Wilkie model: A comparison of the discrete-time with the continuous-time](#)

AIP Conference Proceedings 1974, 020046 (2018); <https://doi.org/10.1063/1.5041577>

[Solution for nonlinear Riccati equation by block method](#)

AIP Conference Proceedings 1974, 020071 (2018); <https://doi.org/10.1063/1.5041602>

[A review on usability guidelines for designing mobile apps user interface for children with autism](#)

AIP Conference Proceedings 2016, 020094 (2018); <https://doi.org/10.1063/1.5055496>

Lock-in Amplifiers

Zurich Instruments

Watch the Video

An Application of the Wilkie Model in Analysing Share Price Index in Malaysia

Nur Afiqah Mohamed Hafiz¹, Norizarina Ishak^{2, a)} and Ahmad Fadly Nurullah Rasedee³

^{1,2} Faculty of Science and Technology,
Universiti Sains Islam Malaysia, Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan, Malaysia.

³ Faculty of Economics and Muamalat,
Universiti Sains Islam Malaysia, Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan, Malaysia.

^{a)}Corresponding author: norizarina@usim.edu.my

Abstract. Wilkie investment model is a stochastic investment model that was built by A. D Wilkie in 1984 and was updated in 1995. The model building objective is forecasting. Box-Jenkins method was the basic structure of Wilkie model. It involves various type of forecasting model. Some model handle stationary time series such as autoregressive moving average (ARMA) model while some of them handle non-stationary time series such as autoregressive integrated moving average (ARIMA) model. There are four sub-models in the Wilkie model which is retail price index model, share dividend yield model, share dividend index model and Consols yield model.

Keywords. Box Jenkins model, Share Prices, Wilkie investment model

I. INTRODUCTION

There are various stochastic investment models built to predict future stock price. A stochastic model is used to forecast the outcomes of an asset like bonds and stocks. It gives idea to traders and investors in optimizing asset allocation and manages asset-liability and is used mostly in financial planning and actuarial work. One of stochastic investment model is the Wilkie investment model. It was created by David Wilkie in 1984 to investigated United Kingdom investment behaviour [4] and the model was updated later in 1995 [5]. The objective of the Wilkie model is for forecasting. Box-Jenkins method was the basic structure of the Wilkie model. It involves various type of forecasting model. Some model handle stationary time series such as autoregressive moving average (ARMA) model while some of them handle non-stationary time series such as autoregressive integrated moving average (ARIMA) model.

Four interconnected models in the Wilkie model [4] such as price index or inflation model, share dividend yield model, share dividend index model and Consols yield or long term interest rate model. In 1995, the model was improved and includes new variables that may affect investment return such as wages index or wages inflation model, short-term interest rate model, property yield and income model, index-linked yield model and exchange rate model [4]. The price index model are handle by using autoregressive conditional heteroscedastic (ARCH) in the new transformed model.

In 1999, Whitten and Thomas continued the studies of the Wilkie model [5]. Instead of using Box-Jenkins method, it was created by involving threshold autoregressive (TAR) method. The different part for this new model from its original model is it was treated as a non-linear stochastic model. There were many past researches done related to Wilkie model such as extending the parameters and applying the Wilkie model to other countries data.

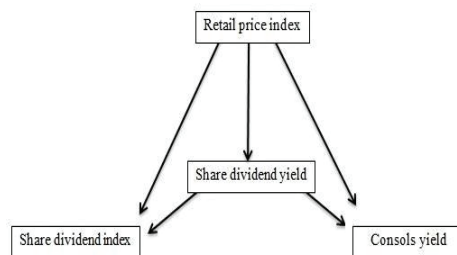


FIGURE 1. The Wilkie model [4]

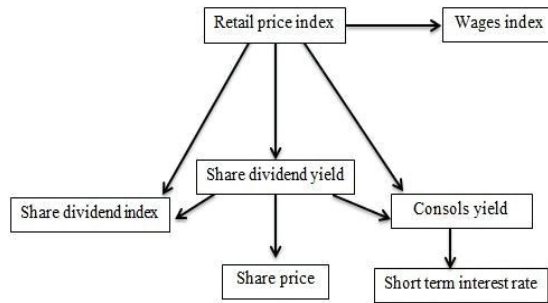


FIGURE 2. The Wilkie model [5]

Figure 1 shows the Wilkie model structure in 1984. The structure is cascade structure where the retail price index or price inflation model control other asset returns. Figure 2 shows the structure of updated Wilkie model in 1995. It has the same cascade structure from Wilkie model in 1984 but in this model, the retail price index or price inflation model control the wages index model that give salary inflation with other assets such as share dividend yield, the share dividend index, the share price and the Consols yield. Short term interest rate model are treat differently and it depend directly on Consols yield or long-term interest rate model. Price index has the strength in determining real asset returns; thus, making it as a main driving force.

This study specifies the stochastic process governing the behaviour of share prices in Malaysia. The purpose of this study is to build a share price model for Malaysia using the same method as the Wilkie model.

II. LITERATURE REVIEW

David Wilkie built a stochastic investment model known as the Wilkie investment model that consist of investment variables [4]. The variables are introduced to the model one by one which is in cascade fashion so it will be easier to add new variables and they won't affect one another. Dividend index depend on the residual of the share yield. There is also a fact that share prices participate in dividend changes. If there are falls in yield, there will be a rise in dividend index.

David Wilkie discussed, the updated and extended Wilkie investment model [4]. The model adds new variables such as wages index and short-term interest rates. A set of data are co integrated if they have constrained movement which moves along not far away from each other. It was found that share price and dividend index move along each other on a vertical logarithmic scale graph indicates that they are co-integrated, when dividends yield are low share price will be high and vice versa.

Ishak aims to apply the Wilkie model on Malaysia data [2]. Some modifications have been made to the Wilkie model because the model is originally being built based on UK data. Box-Jenkins model are fitted to the investment data in Malaysia. FTSE KLCI Bursa Malaysia represent share price index model. FTSE KLCI Bursa Malaysia follow ARIMA(2,1,1)(2,0,2)[12] model.

Miswan et al. has made a comparison study on performance of ARIMA and generalized autoregressive conditional heterocedasticity (GARCH) models [1]. Data used are Kuala Lumpur Composite Index (KLCI). The study found that ARIMA model is a better forecasting technique compared to GARCH model.

III. OBJECTIVE OF STUDY

The objectives of this study are:

- To study the Malaysian share price behaviour statistically
- To build a share price model for Malaysia using the same method as the Wilkie model.
- To compare the Wilkie share price model [2] with our new built share price model.

IV. DATA & METHODOLOGY

This study used Wilkie share price model in forecasting share prices in Malaysia. Monthly historical data from January 1996 to October 2015 are use as the base, whereas the monthly forecast will be for 36 month ahead from November 2015 to October 2018. The tool used is E-views software version 7, E-views 9.5 Student Lite version, Minitab 16. The Wilkie share price model are represent by price index which is FTSE Bursa Malaysia KLCI index. The data was representing by historical yearly share price index of FTSE Bursa Malaysia KLCI index from Bloomberg Terminal. Close price of share price index was chosen as the stock data because it highlights all the