PREDICTABILITY OF THE KLCI PRICE MOVEMENT: EVIDENCE FROM THE TIME SERIES MODELS

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ABSTRACT

This study utilises autoregressive integrated moving average (ARIMA) time series models to predict the price movement of the Kuala Lumpur Composite Index (KLCI). ARIMA-ARCH models, which are ARIMA time series models with GARCH errors (relaxing the normality assumption), are also considered. All fitted models excluding those that exhibit non-stationary autoregressive roots are utilised to generate out-of-sample forecast over the forecast horizons of 1 day, 1 week, 1 month, 3 months, 6 months, 9 months and 1 year. Our forecasting evaluation exercise is based on the commonly used mean absolute percentage error (MAPE). Our results show that all the 17 forecasting models produce MAPE of less than 10% for forecast horizons of 3 months or shorter. For forecast horizons of 6 months and above, the forecast errors range from at most 7% in the case of autoregressive integrated (ARI) models to 16% in the case of integrated moving average (IMA) models. The best performing models are the ARIMA (11, 1, 0) models, with and without GARCH errors, which dominate over the others for 5 out of 7 forecast horizons. The results of the study also show that ARIMA (1,1,0) model is the next best alternative model as far as the parsimonious principle is concerned. In short, this study demonstrates that securities market forecasters may resort to time series approach, which is less resource demanding, for satisfactory short-run forecasts of stock prices.

INTRODUCTION

Time series models

The application of time series models in forecasting financial time series has several advantages. The most important one is that time series models enjoy great simplicity as compared to econometric (structural) models without losing forecastibility. In other words, the forecasting performance of time series models are at least comparable to structural models considering the fact that the former requires minimum information set only.

Unlike a structural model, which needs to include related explanatory variables, a time series model requires only the historical records of the variable under study. (One problem encountered by forecasters using structural models is that the explanatory variables introduced on the right-hand side of the equations make them difficult to use for projection (Six, 1989). It is the simplicity of the time series requirement that enables the resulting model to be a good alternative to the solution of many forecasting problems. It is assumed that movements of time series are solely explained in terms of its own past and therefore forecasts can be made by extrapolation of the past (Harvey, 1993).