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MODELING AND FORECASTING OF BURSA MALAYSIA  
COMPOSITE INDEX USING LINEAR TIME SERIES MODELS  
AND  
KALMAN FILTER

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**Modeling and Forecasting of Bursa Malaysia Composite Index  
Using Linear Time Series Models and  
Kalman Filter**

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## **Abstract**

In this study, attempts have been made to analyze, model and forecast the average monthly movement of Bursa Malaysia composite index (BMCI) using Box-Jenkins ARIMA models. First the daily closing values of BMCI were averaged for each month from January 2000 until December 2004. Altogether, there are 60 monthly averages in the times series. The data was differenced once to remove trend and thus obtain stationarity. Differencing the data nullifies the use of back operator and reduces the general ARIMA model to ARMA form. Next, three models with the lowest Akaike Information Criterion were selected and they were the AR(1,0), MA(0,1) and ARMA(1,1) models. Statistical parameters associated with these models were obtained by minimizing the least square errors. Based on the values of the estimated parameters, predicted values of the time series of each model were compared to the actual values. The average value of BMCI closing index for January 2005 was forecasted by the three models and compared against its true value. Finally, a completely different model was developed using Kalman filtering technique and its performance was compared to those of the three ARIMA models. Results suggest that the Kalman filtering method offers the best least square estimate of the BMCI time series. The performances of the three ARIMA models are nearly identical with the MA model showing a slight advantage over the AR and ARMA models. Statistical softwares that were used to derive the para

the ARIMA models is a public domain software known as R which was developed by several universities. Microsoft excel was also used intermittently. The Kalman filter program was developed using C programming language.

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