CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Work Carried Out

The main objective of the work undertaken in this thesis is to analyze the monthly average of BMCI data by employing ARIMA models and Kalman filtering technique. The results obtained from the ARIMA models and the Kalman filter are compared. First, the monthly average data of the past 5 years are gathered and three ARIMA models are developed based on these data. The parameters that defined each model are estimated with the help of R software and Microsoft Excel. The performances of the three ARIMA models are examined based on the values of Adjusted R square, the estimated error variance and their forecasting ability. It seems that the MA(1) model has a slight advantage over the AR(1) and ARMA(1,1) models. Then Kalman filter model is developed using C programming language. The parameters of Kalman filters are obtained from iterative minimization of least square error. It is observed that the performance of the Kalman filter is superior to those of the ARIMA model in terms of its estimated error variance. It appears that the forecasting ability of the three ARIMA models and that of the Kalman filter is nearly identical with the forecast of the Kalman filter showing the closest value to the real January 2005 average.

5.2 Further Work

Due to time restriction, a number of issues related to this work remain unsolved and are recommended for future work. First, the famous random walk model is not tested for the BMCI data. It would be interesting to develop the random walk model for the BMCI time series since the random walk model is generally regarded as the benchmark of market efficiency. There exist a one to one correspondence of the ARIMA models and the state space structural models that resemble the form of Kalman filter as suggested by Harvey (1990). Transforming the ARIMA models into their linear state space structural forms and using Kalman filter algorithm for computing optimal forecasts for those models would provide an effective method of computing the likelihood. Furthermore, for every model, an assumption of static condition or homoscedasticity is assumed. It would be worthwhile to investigate the effect of generalizing the assumption to include heteroscedasticity and time varying parameters in the ARIMA models and Kalman filter. Wavelet transform has found many applications including time series analysis. It is recommended that the wavelet analysis be carried out on the BMCI data and its performance compared to the traditional ARIMA models with conditional heteroscedasticity, the structural models, the dynamic Kalman filter and some well known smoothing techniques.