GENERATING ONE MILLION RINGGIT MALAYSIA USING ARMA MODEL

WONG SOOK NEE

A DISSERTATION IS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF BACHELOR OF SCIENCE WITH HONOURS

MATHEMATICS WITH ECONOMICS PROGRAMME
SCHOOL OF SCIENCE AND TECHNOLOGY
UNIVERSITI MALAYSIA SABAH

2010

PUMS99:1

UNIVERSITI MALAYSIA SABAH

BORANG PENGESAHAN STATUS TESIS@

JUDUL: Generating One Million Ringgit Malaysia Using ARMA Model

IJAZAH: BACHELOR OF SCIENCE WITH HONOURS

SAYA WONG SOOK NEE (HURUF BESAR) SESI PENGAJIAN: 2009/2010

mengaku membenarkan tesis (LPSM/Sarjana/Doktor Falsafah) ini disimpan di Perpustakaan Universiti Malaysia Sabah dengan syarat-syarat kegunaan seperti berikut:-

1. Tesis adalah hakmilik Universiti Malaysia Sabah.
2. Perpustakaan Universiti Malaysia Sabah dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan dibenarkan membuat salinan tesis ini sebagai bahan pertukaran antara institutsi pengajian tinggi.
4. Sila tandakan (/)

☐ SULIT (Mengandungi maklumat yang berdarjah keselamatan atau Kepentingan Malaysia seperti yang termaktub di dalam AKTA RAHSIA RASMI 1972)

☐ TERHAD (Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan)

☒ TIDAK TERHAD

(TANDATANGAN PENULIS)

Alamat Tetap: 492, JALAN 5, KEPONG ULU, 52100 KL.

Tarikh: 5/5/2010

Disahkan Oleh

(TANDATANGAN PUSTAKAWAN)

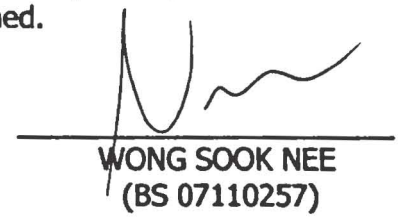
Prof. Dr. Zainodin Haji Jubok
Nama Penyelia

Tarikh: 06/05/2010

CATATAN:- *Potong yang tidak berkenaan.
**Jika tesis ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa /organisasi berkenaan dengan menyatakan sekali sebab dan tempoh tesis ini perlu dikelaskan sebagai SULIT dan TERHAD.
@Tesis dimaksudkan sebagai tesis bagi Ijazah Doktor Falsafah dan Sarjana secara penyelidikan atau disertai bagi pengajian secara kerja kursus dan Laporan Projek Sarjana Muda (LPSM).

DECLARATION

I declare that this dissertation is the result of my work, except the quotations and summaries each of which the source has been mentioned.



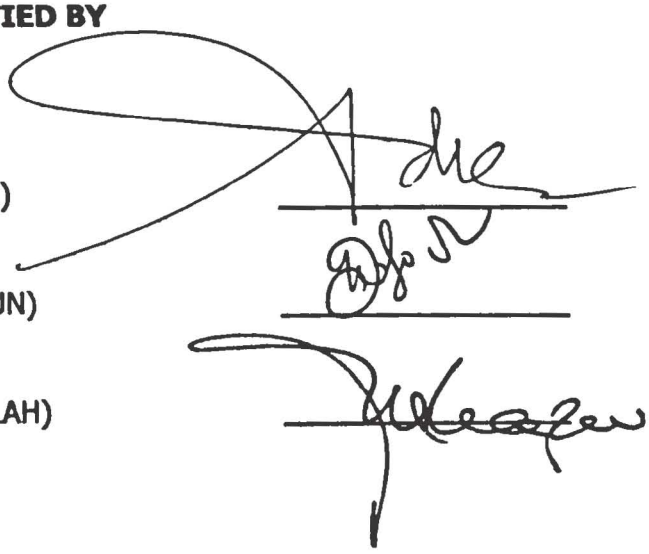
WONG SOOK NEE
(BS 07110257)

03 MAY 2010

CERTIFICATION

CERTIFIED BY

Signature



1. **Supervisor**
   (PROF. DR. ZAINODIN HAJI JUBOK)

2. **Examiner**
   (ASSOC. PROF. DR. HO CHONG MUN)

3. **Dean**
   (PROF. DR. MOHD HARUN ABDULLAH)

ACKNOWLEDGEMENT

I am heartily thankful to my supervisor, Prof. Dr. Zainodin Haji Jubok for his guidance, encouragement and support from the initial to the final stage which enabled me to develop and complete the project. Besides, I am sincerely thanks to all the lecturers and coursemates who providing me knowledge and support all along the way.

Lastly, I offer my regards and blessings to those people who supported me in any respect during the completion of the project.

ABSTRACT

Everyone is looking for methods to increase their income. Buying share is one of them and it is a kind of risky investment to increase the income. Irrational or inappropriate investment will lead to investment loss or investment failure. In this project, time series methods are used to overcome the problems stated. Initially assume that there exist of modal RM 1 000 000 to invest in the Malaysia stock market and then look for the return doubly. ARMA model is used after all the data are stationary and best model will be obtained to estimate the shares' price. The three selected shares, there are Maybank Banking Bhd company, Hong Leong Bank Bhd company and PPB Group Bhd company will be bought and sold according to the estimated price, for instance buy in low price and sell in high price. Nevertheless only the Hong Leong Bank Bhd company achieves the stationary. M78.7 of the highest price and M75.3 of the lowest price are the best models and used to do the forecasting. Approximate 80% of the modal is used to invest in this share. All the profit is accumulated after six months of investments in stock market. The initial RM 1 000 000 is gained a profit of RM 1 212 090 in the end of the project. Now there is RM 2 212 090 on hand. This project will bring benefit to the stock market investor to avoid irrational and inappropriate investments and finally only profit but no loss.

Peruntukan Satu Million Ringgit Malaysia Dengan Menggunakan ARMA Model

ABSTRAK

Setiap orang selalu mencari kaedah untuk meningkatkan pendapatan mereka. Membeli saham adalah salah satu daripada kaedah kaedah tersebut dan itu adalah jenis pelaburan yang berisiko untuk meningkatkan pendapatan. Pelaburan irasional atau tidak tepat akan mengakibatkan kerugian atau kegagalan. Dalam projek ini, kaedah siri masa digunakan untuk mengatasi masalah-masalah yang dinyatakan. Awalnya berasumsi bahawa terdapat modal RM 1 000 000 untuk melabur di pasaran saham Malaysia dan kemudiannya balik pulang the modal dalam dua kali ganda. Model ARMA digunakan selepas semua data mencapai kestabilan dan model terbaik akan diperolehi untuk menganggarkan harga saham. Terdapat tiga saham terpilih, iaitu syarikat Maybank Bhd, syarikat Hong Leong Bank Bhd dan sayrikat PPB Group Bhd yang akan dibeli dan dijual dengan anggaran harga, misalnya membeli pada harga rendah dan menjual pada harga tinggi. Tetapi hanya syarikat Hong Leong Bank Bhd mencapai kestabilan. Harga tinggi terdapat M78.7 dan harga rendah terdapat M75.3 sebagai model terbaik untuk peramalan harga saham. Oleh itu, 80% daripada modal RM 1 000 000 dilaburkan dalam saham ini. Semua keuntungan akan dikumpul selepas tiga bulan pelaburan di pasaran saham. RM 1 000 000 mendapat keuntungan sebanyak RM 1 212 090 pada akhir projek. Sekarang terdapat RM 2 212 090 pada tangan. Projek ini akan membawa manfaat kepada pelabur pasaran saham untuk mengelakkan pelaburan yang tidak rasional dan tidak tepat dan akhirnya hanya keuntungan, tetapi tidak ada kerugian.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF SYMBOLS

=	is equal to
±	is plus or minus
×	is multiplication
≤	is less than or equal to
>	is greater than
Σ	is summation of the term
$\sqrt{}$	is square root of
3E-18	is 3×10^{-18}

CHAPTER 1

INTRODUCTION

1.1 Introduction

An investment in stock market by buying shares of company is only one of the many different ways of investments. By the way, it is a risky form of investment once the predictions are not accurate or the share's prices come with unexpected result. Nevertheless this investment will bring high return in short or long period of investment if compare to other kind of investment. As people said, no pain no gain.

According to Mladjenovic (2009), if an investor was looking for more return on the money, then have to tolerate with more risk. The risk is growing linearly with the return. Thus risk is a response on how the money is concerns and goals. Risk does not only exist during investment period but is present no matter how the money is used or kept. Even though a man just kept the money in his wallet, he will face some kinds of risk such as lost the money or stole by thief. An investor should always be aware of the existed risk to keep the growth of money.

Generally, an investor will receive dividend from the shares or stocks that he/she buys in the stock market as dividend is declared once or twice a year. The amount of dividend is dependent on how much the company pays the profits to shareholders. Classically, a company will only take a small part from its profits as a dividend and will be announced at annual general meeting. A company's performance

is reflected on its yield and it is shown as a gross percentage of the current share price in the market.

As mentioned, the share price that both buyer and seller agree to trade is called market price. As usually, it move up and down on trading day and this reflects the demand and supply of shares of companies.

1.2 Introduction of Kuala Lumpur Stock Exchange (KLSE)

According to Robert Chia and Doreen Soh (1991), Malaysia today's stock exchange was started from ten firms in Singapore and seven firms in Malaya on 21st March 1960. There were established Malayan Stock Exchange and the public trading of shares began on 9th of May. After that, the Board system was published in 1961 and there were two proper trading rooms were set up for shares changed hands. One trading room was in Singapore and one was in Kuala Lumpur and linked by direct phone lines in 1962. Both boards were sharing the same shares and stocks with the single price list that listed on the both boards.

In 1964, after Singapore was participated in the Federation of Malaysia and Singapore, the Stock exchange of Malaysia was formed officially. One year later, means in 1965, Singapore was seceded from Malaysia. Then in May 1973, the Malaysian Government had made a decision to stop the interchange ability of the Malaysian ringgit and Singapore dollar. In consequently, the exchange was abrupt into two different boards and there existed the Kuala Lumpur Stock Exchange (KLSE) and Stock Exchange of Singapore (SES). Although the abruption happened, however, share prices on one board will bring small changes to the other due to activity intercession. As both of the boards are having more than 70% of 300-odd companies co-listed on both exchanges.

According to Othman Yong (1995), in the end of year 1973, there were 262 companies listed in KLSE. 155 companies of the total amount were issued in Malaysia, 69 companies were issued in Singapore and others were from other countries especially from United Kingdom. The total amount was increased to 268 in 1975.

However it drop to 250 companies at the end of 1980 after add-drop and rearranging. Few years later, there is a rapid increase with 13 new companies registered in KLSE in 1989. For details, 307 companies were listed on the board. 53 companies were issued in Singapore and 3 companies were issued in United Kingdom.

At 1st January 1990, all the companies from Singapore were dropped from the board to separate SES from KLSE. This caused to a result of a decrease of total companies listed on board to 254. Nevertheless, rapid growth economy had brought another increase of amount of new companies listed on the board for the next coming years. In the end of 1991, there was a total amount of 324 companies on the board.

Nowadays, KLSE is one of the biggest bourses in Asia. It has over 1000 listed companies that offer a wide range of investment choices. These help in development of Malaysia capital market and growth in economy. For local and global investors, KLSE can be said as an efficient, active and secure trading stock market in the world with its vision that is to be preferred partner in Asia for fund-raising, trading and investment. This is the reason it is offering a fair and orderly market that leads to easy access with variety of products and services.

1.3 Objectives

There are many people interested in doing investment in stock market. As people invest in buying shares is aimed to earn more money, the most important aim of this study on the stock market is to double one million Ringgit Malaysia till the end of 2009, which is from July till December of 2009. This means while that have to make another one million Ringgit Malaysia within this six months.

- To double the one million Ringgit Malaysia
- To earn more money in stock market
- To do the forecasting in stock market
- To have the maximum return and minimize the risk in stock market
- To benefit the investor

1.4 Scope of Study

To achieve all the objectives that mentioned before, there is a scope of study on the stock market has to be done. For overall, the most important thing is that have to know how to make money from the stock market and this involves theories and applications works.

At first, it is necessary to have a clear picture how KLSE's system is running in the market so that none would need a broker. Moreover, the performances of certain companies that being concentrated should be record down as references for further investments in the market. For a high return in investment, stock picking is the most important part for this study. It will be done by referring to the performance of companies as will choose those companies with good performance previously and expect to be continued in the following days.

Besides, a company's annual report is also vital in the determination of stock picking because it is reflecting its previous performance. Therefore analysing the annual report in details will be done for a precise stock picking. After the basic concerns, the best portfolio will be started to setting up and monitor it consequently. In order to have the best result, daily update about the open price and close price is compulsory and also the up and down of the market price of those shares.

1.5 Problem Facing

Nevertheless to achieve the two million goal is not an easy job. At least it requires a lot of work. In fact, doing investment in stock market is a risky investment. Thus one can only buy the shares with the money that on hand, that is one million Ringgit Malaysia. This means while only afford to lose the one million Ringgit Malaysia and of cause this is only the worst situation that has to face. For the worse, that has to compensate for occasional disaster if the company was bankrupt.

Furthermore, we are in the period of economy crisis and in consequently, this will affect the companies' performances to be worse at this moment. Scrip issue, rights issue or convertibles might occur by the companies in process to adjust the market price. It is harder for me in doing stock picking.

1.6 The Importance of this Work

This study is to double the one million Ringgit Malaysia to become two million Ringgit Malaysia. This will benefit all the local investors in doing investments in the local stock market to have the maximum return with the minimum risk to avoid any compensate.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

In order to complete the study of ARMA model used in stock market, there are several research regarding on the related topic are done.

2.2 The Relationship between Stock Prices and Inflation

According to the study of Boucher (2005), there was considered about a new perspective on the relationship of stock prices and inflation, by estimating the common long term trend in the earning price ratio and inflation. It was found that the transitory deviations from this common trend exhibit substantial out of sample forecasting abilities for excess returns at short and intermediate horizons.

For the past, there were studied that the relationship between real stock prices and both of the expected and realized inflation during the post-World War II is not a positive relationship. The negative relationship had meant that there is a correlation between inflation and expected real economic growth, the use of nominal interest rates to discount real cash flows by irrational investors or a subjective inflation risk premium.

The study is more concern on the subjective inflation risk premium explanation. A present value model with a conditional time varying risk premium is considered and the common long term trend in earning price ratio and actual inflation is estimated. After that, the role of the transitory deviations is investigated from the common trend to forecast the stock returns.

The data set contents of quarterly observations from 1951:Q4 to 2003:Q2 and the real data are inflated by Consumer Price Index (CPI). All the stock prices, dividends and earning per share are corresponded to the Standard and Poor's Composite Index.

At the end, the result had shown that the earning price ratio and inflation are statistically significant out of sample predictive power for excess returns over the post war period at the short and intermediate horizons. The forecasting comparison results suggest that the forecast is consistent compare to the forecast that using other popular forecasting variables.

These results prove that there is a strong relationship between earning price ratio and inflation. In addition, the decline in inflation since early 1980s is a result from a large part of the run up in equity ratios that observed from 1982 and also explain the reason for econometric test for structural change provide evidence of a break in the mean financial ratios in 1990s.

In the other hand, the results are contradicted on concerning the efficient market hypothesis. Firstly, the real stock prices are attracted by broad definitions of the fundamental value in the long run which also include the inflation conditional risk premium. Nevertheless, it is hard to rationalize this feature in a normative model. The results are more to the behavioral finance that can identify many of cognitive errors to those investors that are susceptible.

2.3 Factors of Stock Market Dynamics

According to Westerhoff (2004), his study is concerned about the stock market dynamics. In a behavioral stock market, traders are surrounding by greed and fear. Normally the agents are believe in rising markets and then buy stocks but if the share changed too rapidly then they will fear and sell it.

The study model is imitated some stylized facts of stock market dynamics. There is stock prices increase over time, stock markets sometimes crash, stock prices show little pair correlation between successive daily changes and periods of low volatility alternate with periods of high volatility. The most featuring of the model is that the stock prices evolve according to a deterministic low dimensional nonlinear law of motion.

The stock markets are with fast and hectic trading of lots of traders. The behavior of stock prices is complicated but certain universal features can be identified. For example, a positive price trend in the long run is occasionally interrupted by crashes. Furthermore, the log price changes are uncorrelated while temporal independence of total returns is rejected completely.

The study is developing a deterministic behavioral stock market model where agents are influenced by their emotions that are greed and fear. They will optimistically believe in booming markets but will fear when the stock prices change rapidly. Moreover, the agents alternatives change between two activity levels. If the market historical volatility is low, they are rather calm or in the opposite. Concern on what is going on in financial markets is important. It enables to develop some better investment strategies.

The model is the prices adjust according to a log linear price impact function which describes the relationship between the number of assets bought or sold in a certain period of time and the price change caused by the orders. Form the formula, can clearly see that excess buying will drive the prices up and vice versa.

The models with heterogeneous interacting agents bring a successive in replicating the stylized facts of financial markets. It is possible to view the asset price fluctuations as being the result of the interaction between deterministic elements. For example, the orders have generated by simple trading rules and stochastic elements and also the arrival of new information. Besides, better understanding of financial market dynamics is very important to solve practical investment problems and to improve policy tools to regulate the markets.

This study is aimed to develop a complete deterministic model which can imitate some of the features of stock markets. A simple behavior model is found and able to generate quite intricate price changes and temporal dependence in volatility. The model also suggests that emotions such as greed and fear play a role in determinate the stock prices.

2.4 The Transformed Stationary Time Series

Stated by Hosoya and Terasaka (2009), the study is on instantaneous transformed stationary process for parametric inference with Whittle estimator of the parameters related. It also gives an explicit expression of the asymptotic covariance matrix that do not together with the innovation Gaussianity assumption. This study introduces a new version of the Box-Cox transformation study in deep the vector ARMA process with the transformation.

The Box-Cox transformation is aimed to simplify the functional form of the model and with the normality with homoscedastic variance of the error term and also dependent variables that involve in the model. The transformation is requires the argument to be positive and also delimitation of the transformed variables in certain ways that mentioned.

The actual transformation requires the transformed observations within a limited range or the observations with large positive values because of the large positive mean level. A transformation is proposed to solve this problem of limitation with that the variable x can be negative. However it has its own problem.

This study is applied the transformation in two cases of the DGP. The model is fitted in the ratio series of the call money rate (CR), the industry production index (IP), the monetary base (MB) and the nominal effective exchange rate (EXR) with two hypothesis. Each of the series contains 287 observations from March 1975 until January 1999.

The study has shown a method to find Gaussian ARMA model for a modified Box-Cox transformed data set. Nevertheless, there are still some remaining problems such as the extension to approach to non-stationary processes. If the transformation linear process is purely autoregressive with Gaussian innovation process, then the asymptotic result would be reduced to the standard one. If there is Gaussian innovation, then Whittle likelihood will reduce to a transformed Gaussian likelihood and also anticipated the equivalence.

2.5 Time Series Model Selection

According to Qian and Zhao (2007), the paper is study hot to select the model for time series model from many of the candidate ARMA model. A feasible computing

method is proposed based on the Gibbs sample to do the model selection with a random sample generation algorithm. By using the maximum likelihood method, the parameter estimation for a model of fixed dimension is done. It is focus on the computational part in ARMA model selection.

ARMA processes are usually used for modeling time series model. There are many ARMA model selection procedures and methods. Some of them is the graphic method based on autocorrelation and partial autocorrelation function and the information theoretic criteria such as AIC, AICC, BIC and HQC. ARMA model is build up from p autoregressive and q moving average. When p+q is moderately large, say 20, there is infeasible to do the computation all the possible models.

Hence, the paper shows some anticipant optimally of proposed algorithm. A sample of candidate models generated by the proposed algorithm is done the model selection. The best model is obtained if the model has a probability approaching to 1 in the limit and the trend appear early in the model sample. Meanwhile the candidate model has the best criterion value will have the highest probability value. Thus, the best candidate model of all has the highest probability to be generated with the proposed algorithm.

The proposed algorithm is combining of Gibbs sampler with some adjustments. The main adjustment is based on the conditional distributions to avoid the sample generated to be trapped in a local region. Besides, Gibbs sampler is used to determine the parameter to be included in each of the generated candidate model. For estimating parameters, it is still using the standard maximum likelihood principle.

There are four empirical procedures to use a generated sample of candidate model for model selection. Firstly, find the model with the best model selection criterion value on the sample. Secondly, find the model with highest sample

frequency. Thirdly, identify the most significant ARMA components. Lastly is a multi step procedure and may be regarded as a hybrid of the first three.

China's Consumer Price Index (CPI) data is used for motivating the model selection study. Data from December 1983 until December 2003 for China's CPI is used. Every score in the data is the ratio of the current price to be one 12 months earlier. China's economy has maintained a fast speed of growing for the past 20 years so can see that the inflation rate can achieve until 30% or more in the data. However China experienced deflation in 1999 and 2002.

The main idea of the method is that the best model is the model with high probability from a generated random sample of the candidate model. To apply the method in practice may encounter some complications, hence the four empirical procedures are developed to solve them. The result is shown that the method is computationally feasible, effective and also comprehensive.

2.6 Exponential Prediction Models

According to Sydow *et al.* (2001), sequence operators are introduced to solve for exponential prediction models of time series. Generally a time series will consist of some components, there are trend, cycle, seasonal variations and irregular fluctuations. Therefore no single method of forecasting has succeeded with very accurate prediction or forecasting. In addition, outlier will be excluded always and this causes the inaccuracy of forecast. Natural disasters are also a main element to bring the inaccuracy.

The paper is aimed to present a method for point forecast and interval forecast and also techniques for disasters predictions, seasonal disasters, stock market-like predictions and system predictions.

REFERENCES

Akaike, H. 1969. Fitting autoregressive models for prediction. *Annals of the Institute of Statistical Mathematics,* **21**: 243-347.

Akaike, H. 1974. A New Look at Statistical Model Identification. *IEEE Transactions Automatic Control AC,* **19**: 716-723.

Ahmad Shukri Yahaya, Amran Ahmed, Darmesah Gabda & Na, C. S. 2008. *Problems & Solutions in Statistics for Engineer & Scientists.* Prentice Hall, Petaling Jaya.

Boucher, C. 2006. Stock Prices-Inflation Puzze and the Predictability of Stock Market Returns. *Economics Letters* ,**90**: 205-212.

Chorafas, D. N. 2006. *Wealth Management: Private Banking, Investment Decisions and Structured Financial Products.* Butterworth-Heinemann, Oxford.

Dickey, D. & Fuller, W. 1979. Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association,* **74**: 427-431.

Golub, G.H., Heath, M. & Wahba, G. 1979. Generalized cross-validation as a method for choosing a good ridge parameter. *Technometrics,* **21**: 215-223.

Hamilton, J. D. 1994. *Time Series Analysis.* Princeton University Press, Princeton, New Jersey.

Hannan, E.J. & Quinn, B. 1979. The Determination of the Order of an Autoregression. *J. Royal Stat. Society,* **41** (Series B): 190-195.

Hosoya, Y. & Terasaka, T. 2009. Inference on Transformed Time Series. *Journal of Econometrics* ,**151**: 129-139.

Ismail, B. M., Ningsih, S. C. & Dastril, Y. 2007. Unimodality Tests for Global Optimization of Single Variable Functions Using Statistical Method. *Malaysian Journal of Mathematical Sciences,* **1**(2):43-53.

Krefetz, G. 1993. *The Basic of Stocks.* S. Abdul Majeed & Co, Kuala Lumpur.

Madsen, H. 2007, *Time Series Ananlysis.* CRC Press, Boca Raton.

Mason, R. D., Lind, D. A. & Marchal, W. G. 1996. *Statistical Technique in Business and Economics.* McGraw-Hill Companies, Inc, Boston.

Mladjenovic, P. 2009. *Stock Investment For Dummies.* 3rd Ed., Wiley Publishing, Hoboken.

Qian, G.& Zhao, X. 2007. On Time Series Model Selection Involving Many Candidate ARMA Model. *Computational Statistics & Data Ananlysis* ,**51**: 6180-6196.

Ramanathan, R. 2002. *Introductory Econometrics with Applications.* Harcourt College Publishers, Fort Worth.

Rice, J. 1984. Bandwidth Choice for Nonparametric Kernel Regression. *Annals of Statistics.* **12**: 1215-1230.

Robert, C. & Doreen, S. 1991. *How to Invest in Stocks & Shares.* 3rd Ed. Times Books International, Singapore.

Schwarz, G. 1978. Estimating the Dimension of a Model. *Annals of Statistics.* **6**: 461-464.

Shibata, R. 1981. An Optimal Selection of Regression Variables. *Biometrika* **68**: 45-54.

Shkolnik, E. 2003. *When Buy Means Sell: An Investor's Guide to Investing When It Count.* McGraw-Hill, New York.

Studenmund, A.H. 2006. *Using Econometrics: A Practical Guide.* Addison Wesley Pearson, Boston.

Sydow, A., Lin, Y., Liu, S., DeNu, R. & Mennell, W. 2001. Exponential Prediction Models based on Sequence Operators. *Kybernetes* ,**30** (4): 397-410.

Weaterhoff, F. H. 2004. Greed, Fear and Stock Market Dynamics. *Physica A* ,**343**: 635-642

White, J. 1994. *How to Invest in Stocks & Shares.* 2nd Ed. How To Books, Plymouth.

Yong, O. 1995. *Saham: Satu Pengenalan tentang Gelagat Perubahan Harga Saham dan Maklumat Asas Bursa Saham Kuala Lumpur.* Dewan Bahasa dan PustakaKementerian Pendidikan, Kuala Lumpur.