

The copyright © of this thesis belongs to its rightful author and/or other copyright owner. Copies can be accessed and downloaded for non-commercial or learning purposes without any charge and permission. The thesis cannot be reproduced or quoted as a whole without the permission from its rightful owner. No alteration or changes in format is allowed without permission from its rightful owner.



**MACROECONOMIC DETERMINANTS OF STOCK MARKET  
PERFORMANCE IN MALAYSIA**



**MASTER OF SCIENCE (FINANCE)  
UNIVERSITI UTARA MALAYSIA  
AUGUST 2021**

**MACROECONOMIC DETERMINANTS OF STOCK MARKET  
PERFORMANCE IN MALAYSIA**

**By**



**HASLYZA BINTI HASHIM**

**UUM**  
**Universiti Utara Malaysia**

**Thesis Submitted to  
School of Economics, Finance and Banking (SEFB)  
Universiti Utara Malaysia,  
in Partial Fulfilment of the Requirement for the Master of Science (Finance)**

## CERTIFICATION OF THESIS WORK



### PERAKUAN KERJA KERTAS PROJEK (Certification of Project Paper)

Saya, mengaku bertandatangan, memperakukan bahawa  
(I, the undersigned, certified that)  
**HASLYZA BT. HASHIM (825852)**

Calon untuk Ijazah Sarjana  
(Candidate for the degree of)  
**MASTER OF SCIENCE (FINANCE)**

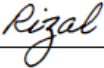
telah mengemukakan kertas projek yang bertajuk  
(has presented his/her project paper of the following title)

**MACROECONOMIC DETERMINANTS OF STOCK MARKET PERFORMANCE IN MALAYSIA**

Seperti yang tercatat di muka surat tajuk dan kulit kertas projek  
(as it appears on the title page and front cover of the project paper)

Bahawa kertas projek tersebut boleh diterima dari segi bentuk serta kandungan dan meliputi bidang ilmu dengan memuaskan.  
(that the project paper acceptable in the form and content and that a satisfactory knowledge of the field is covered by the project paper).

Nama Penyelia : **DR. AHMAD RIZAL B. MAZLAN**  
(Name of Supervisor)

Tandatangan :   
(Signature)

Tarikh : **19 AUGUST 2021**  
(Date)

## PERMISSION TO USE

In presenting this thesis in fulfillment of the requirement for the Post Graduate Degree of Master of Science (Finance) from Universiti Utara Malaysia, I agree that the university library make it freely available for inspection. I further agree that permission of copying of this thesis in any manner, in whole part or in part, for scholarly purposes may be granted by my supervisor(s) or, in their absence, by the Dean of School of Economic, Finance and Banking. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to Universiti Utara Malaysia for any scholarly use which may be made of any material from my thesis.

Requests for permission to copy or to make other use of materials in this thesis, in whole or in part should be addressed to:

Dean  
School of Economic, Finance and Banking  
Universiti Utara Malaysia  
06010 UUM Sintok  
Kedah Darul Aman Malaysia

## ABSTRACT

Year 2020 is a challenges year, not for Malaysia but also the whole country in the world due to the COVID-19 pandemic. The country's economy and the stock market were affected as a result of the implementation of the movement control order introduced to combat the COVID-19 infection. This study is to examines the relationship of the macroeconomic on the Malaysian stock market performance: FTSE Bursa Malaysia KLCI Index. More specifically, this research aims to extend the current literature reviews by including interest rate, inflation rate, GDP, exchange rate as the macroeconomic variable. Then, market capitalization and market turnover as the control variable in determining their relationships towards the Malaysian stock market performance. By using E-Views 10, Analytical model is performed to examine the hypotheses and statistical relationships in a yearly basis from 1990 to 2020. From the empirical result, it showed that two variables were significant (exchange rate and market capitalization) while other variables were not.

**Keywords:** Malaysian stock market performance, FTSE Bursa Malaysia KLCI Index, E-Views 10, interest rate, inflation rate, GDP Growth, exchange rate, market capitalization and turnover.

## ABSTRAK

Tahun 2020 merupakan tahun yang penuh cabaran bukan hanya kepada Malaysia malahan seluruh dunia kerana menghadapi pandemik COVID-19. Keadaan ekonomi negara dan pasaran saham terjejas ekoran daripada pelaksanaan perintah kawalan pergerakan yang diperkenalkan bagi mengatasi jangkitan COVID-19. Kajian ini adalah untuk mengkaji hubungan makroekonomi terhadap prestasi pasaran saham Malaysia: FTSE Bursa Malaysia KLCI Index. Lebih khusus lagi, penyelidikan ini bertujuan untuk memperluas tinjauan literatur semasa dengan memasukkan kadar faedah, kadar inflasi, KDNK, kadar pertukaran sebagai pemboleh ubah makroekonomi. Kemudian, permodalan pasaran dan jumlah pasaran sebagai pemboleh ubah kawalan dalam menentukan hubungan mereka dengan prestasi pasaran saham Malaysia. Dengan menggunakan E-Views 10, model analitik dilakukan untuk memeriksa hipotesis dan hubungan statistik secara tahunan dari tahun 1990 hingga 2020. Dari hasil kajian, menunjukkan bahawa dua pemboleh ubah adalah mempunyai hubungkait (kadar pertukaran dan permodalan pasaran) sementara pemboleh ubah lain adalah tidak.

**Kata kunci:** Prestasi pasaran saham Malaysia, Indeks FTSE Bursa Malaysia KLCI, E-Views 10, kadar faedah, kadar inflasi, Pertumbuhan KDNK, kadar pertukaran, permodalan pasaran dan perolehan.

## ACKNOWLEDGEMENT

### **In the Name of Allah, the Most Forgiving, Most Merciful**

All praises and gratitude to the Almighty Allah, for giving me the opportunity to undertake this Postgraduate Master's Degree and for giving me the great strength, patience, courage, and wisdom throughout the journey in completing this study in such a short time. The completion of this study also would not have been possible without the encouragement, contributions, and guidance from the people around me.

My deepest and utmost appreciation goes to Dr. Ahmad Rizal Bin Mazlan who has provided unlimited amount of encouragement, insight, professional guidance, and constructive feedbacks that put me on the right track. His profound knowledge and rich research experience had assisted the progress of my research; besides, he keeps on guiding and advising me with patience and care.

Besides, I would like to express my tremendous gratitude and appreciation to my loving family for encouraging and supporting me to take this journey. My very special gratitude and appreciation goes to my husband, Mohd Adha Bin Lemam for their unconditional love, prayers, and motivation and to all my kids Muhammad Adam Syazwan, Ummu Hawa Syazwany and Muhammad Ammar Syahmie for your really understanding and patient toward me.

Also, thank you to all lecturers in Universiti Utara Malaysia who taught me while I was pursuing my Master of Science (Finance) and to all my friends.

This research will not be being able to complete without the cooperation and support from the management of Universiti Utara Malaysia.

**May Allah bless all of you for your kindness. Amin.**



## TABLE OF CONTENT

Certification of Thesis Work .....	i
Permission To Use .....	ii
Abstract .....	iii
Abstrak.....	iv
Acknowledgement .....	v
Table of Content .....	vi
List of Tables .....	xi
List of Figures .....	xii
List of Abbreviations.....	xiii

### INTRODUCTION

1.0 Introduction of The Study .....	1
1.1 Background of the study .....	1
1.1.1 Review of Global Economic .....	1
1.1.2 Review of Malaysia Economic .....	4
1.1.3 Background of FTSE Bursa Malaysia KLCI .....	4
1.2 Problem Statement .....	5
1.3 Research Question .....	9
1.4 Research Objective.....	10
1.5 Significance of Study .....	11
1.6 Definition of Key Term .....	12
1.6.1 Interest rate .....	12
1.6.2 Inflation rate .....	12
1.6.3 Growth Domestic Product (GDP) .....	12
1.6.4 Exchange rate .....	13

1.6.5	Stock market performance .....	13
1.6.6	Market Capitalization .....	13
1.6.7	Turnover.....	13
1.7	Organization of study .....	14
 <b>LITERATURE REVIEW</b>		
2.0	Introduction of Literature Review.....	16
2.1	Literature Review.....	16
2.1.1	Stock Market Performance .....	17
2.1.2	Interest rate .....	18
2.1.3	Inflation rate .....	19
2.1.4	Gross Domestic Product (GDP).....	20
2.1.5	Exchange rate .....	21
2.1.6	Market Capitalization.....	22
2.1.7	Turnover.....	23
2.2	Theoretical Review .....	24
2.2.1	Market Efficiency Theory .....	24
2.2.2	Arbitrage Pricing Theory.....	25
 <b>METHODOLOGY</b>		
3.0	Introduction of Research Methodology.....	27
3.1	Research Framework .....	27
3.2	Hypothesis .....	29
3.3	Research Design .....	30
3.3.1	Type of study .....	30
3.3.2	Source of data .....	31
3.3.3	Unit of Analysis .....	32

3.3.4	Population of frame .....	33
3.4	Data processing .....	33
3.5	Data technique analysis .....	34
3.5.1	Multiple Linear Regression Model .....	35
3.5.2	Ordinary Least Square.....	35
3.5.3	E-Views 10.....	36
3.5.4	Diagnostic Checking.....	37
3.5.4.1	Normality Test- Jarque- Bera Test.....	37
3.5.4.2	Multicollinearity.....	37
3.5.4.3	Heteroscedasticity/ Heteroskedasticity.....	38
3.5.4.4	Autocorrelation.....	39
3.5.5	F -test.....	40
3.5.6	T-test.....	41
3.6	Conclusion.....	42
<b>RESULT AND DISCUSSION</b>		
4.0	Introduction.....	43
4.1	Diagnostic Checking.....	43
4.1.1	Descriptive Statistic .....	43
4.1.2	Normality Test- Jarque- Bera Test.....	45
4.1.3	Multicollinearity.....	46
4.1.3.1	High R Square.....	46
4.1.3.2	High Pairwise Correlation.....	47
4.1.3.3	Variance Inflation Factor (VIF) and Tolerance Factor (TOF).....	48
4.1.4	Heteroscedasticity/ Heteroskedasticity.....	49
4.1.5	Autocorrelation.....	50

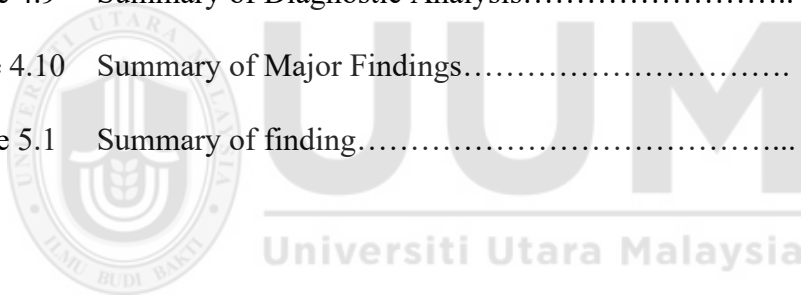
4.2	Hypothesis Testing.....	51
4.2.1	F-Test.....	51
4.2.2	T-Test.....	53
4.3	Summary of Statistical Analysis.....	49
4.4	Discussion of Major Findings.....	55
4.4.1	Inflation rate.....	57
4.4.2	Exchange rate.....	57
4.4.3	Gross Domestic Product (GDP).....	58
4.4.4	Interest rate .....	59
4.4.5	Market Capitalization.....	60
4.4.6	Turnover.....	60
4.5	Conclusion .....	61
<b>CONCLUSION AND RECOMMENDATIONS</b>		
5.0	Introduction .....	63
5.1	Summary of finding.....	63
5.2	Implications of the Study .....	64
5.3	Limitations of Study .....	65
5.4	Recommendations for Future Research.....	66
5.5	Conclusion .....	67
References .....		69
Appendix 1 .....		79
Appendix 2 .....		80
Appendix 3 .....		81
Appendix 4 .....		82
Appendix 5 .....		83

Appendix 6 .....	84
Appendix 7 .....	85



## LIST OF TABLES

Table 3.1	Source of data.....	31
Table 4.1	Summary of Descriptive Statistic Analysis .....	43
Table 4.2	Summary of Normality Test- Jarque-Bera .....	46
Table 4.3	Pair-Wise Correlation coefficients .....	47
Table 4.4	VIF and TOL results .....	48
Table 4.5	Heteroscedasticity Test – ARCH .....	49
Table 4.6	Autocorrelation – Breusch-Godfrey .....	51
Table 4.7	Result of F-Statistic .....	52
Table 4.8	T-Statistic and P-value result.....	53
Table 4.9	Summary of Diagnostic Analysis.....	55
Table 4.10	Summary of Major Findings.....	56
Table 5.1	Summary of finding.....	63



## LIST OF FIGURES

Figure 1.1	Timeline for Formation of Bursa Malaysia .....	5
Figure 1.2	The FTSE Bursa Malaysia Index performance graph from year 1990 until 2020 .....	7
Figure 3.1	Conceptual Framework .....	28
Figure 3.2	Diagram of Data Processing .....	34
Figure 3.3	Autocorrelation Problem Detection Test.....	39



## LIST OF ABBREVIATIONS

GDP	Growth Domestic Product
KLCI	Kuala Lumpur Change Index
PCE	Consumer Spending
US	United State
YOY	Year on Year
CPI	Consumer Prices Index
IMF	International Monetary Fund
DES	Dhaka Stock Exchange
S&P	Standard and Poor
EMH	Efficient Market Hypothesis
LKLCI	FTSE Bursa Malaysia KLCI index performance
LCPI	Inflation rate
LEXCHANGERATE	Exchange rate
LGDP	Growth Domestic Product rate
LI	Interest Rate
LMCAP	Market Capitalization of FTSE Bursa Malaysia KLCI
LT	Market Turnover of FTSE Bursa Malaysia KLCI
C	Intersect Value
OLS	Ordinary Least Square
VIF	Variance Inflation Factor
TOL	Tolerance Factor



# CHAPTER 1

## INTRODUCTION

### 1.0 Introduction of The Study

This study seeks to analyze the relationship created between the macroeconomic variable namely interest rate, inflation rate, Growth Domestic Product (GDP) and exchange rate towards the stock market performance of FTSE Bursa Malaysia KLCI Index. This study also analyzes the relationship of the market capitalization and turnover as the control variable towards the stock market performance of FTSE Bursa Malaysia KLCI Index.

### 1.1 Background of The Study

This background of study is cover on review of global economic, Malaysia economic and some background on the FTSE Bursa Malaysia KLCI Index. The review on economic is cover on the US, Eurozone, China and Malaysia on the current economic conditions and stock market performance.

#### 1.1.1 Review of Global Economic

Year 2020 is a challenges year, not for Malaysia but also the whole country in the world due to the COVID-19 pandemic. The country's economy and the stock market were affected as a result of the implementation of the movement control order introduced to combat the COVID-19 infection. Dow Jones the

main market index in US was drop about 22.4% in March 2020 from the opening in January 2020 as an impact from the COVID-19 pandemic. In year 2020, due to the coronavirus pandemic, the unemployment number were increase because of the unessential business were asked to be closed and it was making the unemployment rate record at 14.7% in April 2020. This is compounded by the fact that the restriction to travelling and closed of the business-like bars, restaurant and hotel, the US economy was lost about 20.8 million number of jobs in April 2020. As result from that, the 2<sup>nd</sup> Quarter 2020, U.S. Gross Domestic Product (GDP) was stood at 31.4%.

Even though a lot of stimulus packages is announced by the government to assist the people, but the high unemployment rates are causing people to less spend in 2020. The consumer spending (PCE) is declined of 6.9% in 1<sup>st</sup> Quarter 2020 before plunged to 33.2% in 2<sup>nd</sup> Quarter 2020. The biggest drop starting from April 2020 when people start to stay at home and it make the consumer spending stood only at \$1.5 trillion, or declined to 12%, from March 2020.

In the early stage, the mid-term outlook for economies, business cycle and company earning is seemed positive. With expectation in year 2021, the feature periods of lowest in inflation, lowest in interest rate are support the equities versus bonds. For the near-term risks is when people start to optimistic on the announcement of the vaccine. The biggest challenges for US markets are when the major equity market is concentration more on the big cap tech stocks, relatively luxury equity and credit valuations and obvious on the industry.

The Euro economic also not escaped from the coronavirus pandemic and all the restriction as others county facing. The pandemic is seemed was hit the Euro economy extremely hard starting in 2<sup>nd</sup> Quarter 2020. In 2<sup>nd</sup> Quarter 2020 the euro economic was reported its strongest recession was contracted at 11.8%, same as the worst situation experienced during the global financial crisis. Among the largest member countries, the stronger hit on the GDP on 2<sup>nd</sup> Quarter 2020 is from Spain, shrinking by 18%, followed by France reduce by 14%, Italy down 13% and Germany reduce 10% contraction.

The European stock market, FTSE 100 was decline 22% from the January 2020 as an impact from the coronavirus pandemic. Europe is gearing up for a strong post- vaccination, but the second wave of the pandemic has reversed the recovery to in line with others to record negative Gross Domestic Product (GDP) in the 4<sup>th</sup> Quarter 2020.

During the hit on coronavirus, 1<sup>st</sup> Quarter 2020 China economic was shrinking by 6.8%. The number of export and manufacturing decline and make the China's economic recovery accelerated in the 3<sup>rd</sup> Quarter 2020 as people still cautious on the coronavirus, with the resurgent of coronavirus cases globally and adding with the ongoing tension from US over the range issues.

The coronavirus pandemic in year 2020 was the biggest crash for the stock market over the world that giving a bad impact on the world economic. Hope with the announcement of the vaccine will boost the economic over the world to recovery in year 2021.

### **1.1.2 Review of Malaysia Economic**

Malaysia's economic is expected to be growing by 6.5% to 7.5% in 2021 following a Growth Domestic Product (GDP) rate was recorded negative 5.6% in 2020. The expectation in year 2021 that the economic activity to recovery is depending on the successful and effectively roll out and distribution of the vaccine. With the positive progress of the vaccination program, it will boost the faster recovery on the economic after the reopening of business activities as usual.

Malaysia was the first time reduce the interest rate to the lowest in 10 years of 1.75% starting in March 2020. This will continue the county to provide more stimulus to the economic. However, this is still subject to downside risks, especially on the ongoing uncertainties of the coronavirus pandemic situations domestically and globally.

Malaysia as other countries facing a challenging year in 2020 and hope for a recovering in year 2021 as a positive development of a vaccine for COVID-19. The recovering on the economic will gives a good and very positive impact on the stock market directly or indirectly.

### **1.1.3 Background of FTSE Bursa Malaysia KLCI**

The stock market exchange in Malaysia was started on early 1960s, the name was known as Malaysian Stock Exchange (MSE). While in 1973, the name

changes to Kuala Lumpur Stock Exchange (KLSE) until 2004 it was renamed as Bursa Malaysia. Then in 2006 KLSE was changed to FTSE Bursa Malaysia KLCI after Bursa Malaysia partner with FTSE.

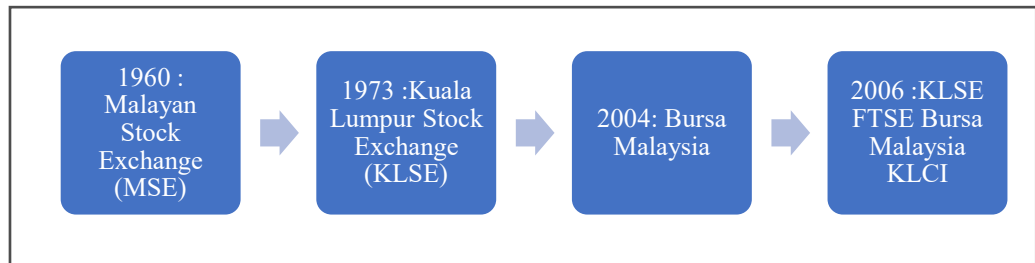


Figure 1.1  
*Timeline for Formation of Bursa Malaysia*

FTSE Bursa Malaysia consist of 2 market were Main Market and ACE Market.

Under Main Market there are 6 Index namely FTSE Bursa Malaysia KLCI, FTSE Bursa Malaysia Mid 70 Index that represent a FTSE Bursa Malaysia Top 100 Index, FTSE Bursa Malaysia Small Cap Index, FTSE Bursa Malaysia Emas Index and FTSE Bursa Malaysia Fledgling Index. Where, FTSE Bursa Malaysia KLCI consist of thirty largest companies listed.

The performance of FTSE Bursa Malaysia KLCI is the market indicator for the Malaysian stock market. That is important for Malaysia to have a stable and good performance in the stock market to shows that the Malaysia economic is in stable and good performance to attract the investors to invest to Malaysia.

## 1.2 Problem Statement

The nightmare for among the economic crisis was the Asian Financial Crisis in 1997 and 1998, Malaysian economy crippled and give a big impact to

Malaysia stock market performance. The KLCI had lost about 79% during that period. The overnight rate was jumped over 40% from 8% before the crisis. At that time, the Ringgit was hit by the speculators and Malaysia imposed the strict capital control and introduced a 3.80 against the US dollar.

In 2007 and 2008, Global Financial Crisis was dragging the KLCI performance reduce more than 40% at that period. The Real gross domestic products (GDP) were stood at 0.1% year-on-year (YOY) in the 4<sup>th</sup> Quarter 2008 compared to a 4.7% YOY growth in the 3<sup>rd</sup> Quarter 2008. Interest rates reduce from 3.5% to lower at 2%.

Currently starting in March 2020, Malaysia and over the world was shocked by the attacked from the COVID-19 pandemic. Malaysia economy has once again been plagued by the covid19 pandemic where all sectors within and outside the country had to be stopped to prevent the spread of the epidemic during the Movement Control Order (MCO) was implement. We can see the KLCI was drop of 25% from the higher of 1,600 points on the early of the year and drop to 1,200 points in March 2020. The interest rate also was reduced for 3 times in the year to the lower of 1.75%. The actual Malaysia Growth Domestic Product (GDP) was negative 5.6% in year 2020. The huge drop was in 2<sup>nd</sup> Quarter 2020 of negative 17.1% as an impact from the COVID-19.



Figure 1.2  
*The FTSE Bursa Malaysia Index performance graph from year 1990 to 2020.*  
 SOURCE: Bloomberg

The important that we can understand during the economic crisis, is how was the performance of the macroeconomic. The worst performance would lead to the movement of the stock price and economic growth. The expectation from the macroeconomic is that will give an impact to the Malaysia stock market or not.

The study to this related topic had well been studied by other research over the past decades. Stock market as the important role in establishment of the economic. It will involve in valuation of supply and demand of the equity in the stock market. This valuation is useful to investors, government, industry, central bank and creditors as an idea in making decision related to the stock market and economic. That why, they are concern more on what will happen on the stock market from times to times.

It was support by many researchers that make the study on the relationship of macroeconomic and stock market over the world like in New Zealand study

from Gan, Lee, Yong & Zhang (2006), Shubita and AL-Sharkas (2010) studies on related topic on New York Stock Exchange, in Taiwan research from Singh, Mehta & Varsha, (2011), in India investigation from Patel (2012), while, Tangjitprom (2012) investigate on Thailand stock market and in Pakistan examination from Alam & Rashid (2014) done on the related topic.

Recently, this topic become the popular topic to be discussed by researchers. Even though the results from the various study are ambiguous and vary from each country, it was due to the behavior and the economic condition of each country. It is still providing guidelines for the policy maker and investor in implementation or making the economic decision. It more on the matter to study on the economic theory and rules.

The study on the relationship between macroeconomic variable toward the stock market performance in Malaysia is seem needed to assist the related party in implementation of the related economic policy that is favorable. Since, the ongoing current event, the result and outcome from the previous study was outdated and may cannot be applied to the current economic conditions.

Therefore, it is important to understand the relationship between macroeconomic variable toward the stock market performance. This paper was extending to the question whether macroeconomic have a related behavior on the stock market. Hence, this study is targeted to testing the performance of FTSE Bursa Malaysia KLCI index that impacted by macroeconomic variables



of interest rate, inflation rate, Growth Domestic Product (GDP) and exchange rate.

Hence, this study will make further discussion on the behavior of the FTSE Bursa Malaysia KLCI index towards the various indicators or variable. So that, other than macroeconomic variable this study also examined the others control variable in determinant of the stock market performance. The control variable examine are the market capitalization and turnover.

### **1.3 Research Question**

The following questions need further discussion upon the issues that have been addressed in the research problem. The research questions are as follows:

- 1) Is there any relationship between interest rate and stock market performance among FTSE Bursa Malaysia KLCI index?
- 2) Is there any relationship between inflation rate and stock market performance among FTSE Bursa Malaysia KLCI index?
- 3) Is there any relationship between Growth Domestic Product (GDP) and stock market performance among FTSE Bursa Malaysia KLCI index?

- 4) Is there any relationship between exchange rate and stock market performance among FTSE Bursa Malaysia KLCI index?
- 5) Is there any relationship between market capitalization and stock market performance among FTSE Bursa Malaysia KLCI index?
- 6) Is there any relationship between turnover and stock market performance among FTSE Bursa Malaysia KLCI index?

#### **1.4 Research Objective**

The objective of this study is to analyze the relationship between macroeconomic variable of interest rate, inflation rate, Growth Domestic Product (GDP) and exchange rate towards the stock market performance of FTSE Bursa Malaysia KLCI index. This study also to analyze the relationship between market capitalization and turnover as the control variable towards the stock market performance of FTSE Bursa Malaysia KLCI index. To simplify this, the objective can be address as follows:

- 1) To examine the relationship between interest rate and stock market performance among FTSE Bursa Malaysia KLCI index.
- 2) To study the relationship between inflation rate and stock market performance among FTSE Bursa Malaysia KLCI index.

- 3) To investigate the relationship between Growth Domestic Product (GDP) and stock market performance among FTSE Bursa Malaysia KLCI index.
- 4) To explore the relationship between exchange rate and stock market performance among FTSE Bursa Malaysia KLCI index.
- 5) To understand the relationship between market capitalization and stock market performance among FTSE Bursa Malaysia KLCI index.
- 6) To assess the relationship between turnover and stock market performance among FTSE Bursa Malaysia KLCI index.

## **1.5 Significance of Study**

Firstly, the expectation from this study is to encouraging the students to be more excited to find and explore more models or variables that will be benefit to the public and private universities to examine the relationship toward the stock market performance.

Second, this will be guidance for the investors or any person that have an interest in stock market to have a better understanding and have a good strategy in identified the macroeconomic variables have or not a relationship to the stock market.

Third, this study will be very meaningful to the policy makers and the government agencies. Where they can use this finding as a guidance or additional information in making a decision on the related issues.

Fourth, hopefully from the result of this study, it will give a more view to the related topic and issue that can be used to other researcher as the literature, reference and to have an improvised on the selected variable for further study on this related topic.

## **1.6 Definition of Key Term**

### **1.6.1 Interest rate**

Alam and Uddin (2009) stated that an interest rate is identified as a cost of capital, borrowing rate and lending rate as well.

### **1.6.2 Inflation rate**

Inflation is defined as a continuous growth in the general price level of common goods and services in a country (Hossain, 2012).

### **1.6.3 Growth Domestic Product (GDP)**

Gross Domestic Product (GDP) denotes by sum up all the production of residents in a country's economy, adding all the taxes and subsidies will be not include the value of the product. (Khalid Kalam, 2020)

### **1.6.4 Exchange rate**

Exchange rate refers to a value of one country's currency exchange for another country's currency. (Singh, Metha & Varsha, 2011).

### **1.6.5 Stock Market Performance**

Stock market performance is the assessment of an efficient market. A basic feature of an efficient capital market is constant liquidity, an easy mechanism for entry and exit by investors. This requires sufficient volume and size of transactions in the market. (Yartey and Adjasi, 2007).

### **1.6.6 Market Capitalization**

Ime T. Akpan stated in the research that from Yasmin and Yusuf (2009) in their own contribution defined market capitalization as "A measurement of corporate size". It can also be referred to as the value of a company, reflecting the number of outstanding stocks multiplied by the number of current stock price.

### **1.6.7 Turnover**

The ratio of the number of shares traded to the number of shares outstanding is known as turnover, or sometimes as relative volume. Turnover is used as the volume measure in most previous studies. (Jain and Joh (1988) and Mulherin and Gerety (1989)).

## **1.7 Organization of Study**

There are five (5) chapters have been organized for this study as follows:

Chapter one (1) is addressing on the whole idea of the research. This chapter consists of introduction to this research and followed by the definition of key term, research background, research objective, problem statement, significance of the study, research question and organization of study.

Chapter two (2) are discussing and highlighting on the literature review of the variables involved which are inflation rate, interest rate, Growth Domestic Product (GDP), exchange rate, market capitalization and turnover. Besides, it is included with the theory used for the study.

Chapter three (3) will further explain on the research methodology. There will be complete explanations on the research framework, data technique analysis, hypothesis, research design and data processing.

Chapter four (4) will continue with the diagnostic checking. After that do a hypothesis testing. The outcomes from all the testing will be analyze and will be discussing to answer the hypothesis question.

Chapter five (5) will summarize the result from the diagnostic checking and hypothesis test to identify the implications, limitations and to give a recommendation on how to overcome the issue exist for future study.



## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.0 Introduction of Literature Review**

The literature review chapter has been carried out to justify the literature review addressed from this study. Literature review is about the summarization, evaluation, and view on the different from the previous study. It to assist a future researcher to have an idea in preparing the study on the related topic. In addition, literature review can used as reference from the previous finding whether the independent and dependent variable is having a correlation or not based on the same or different methodology. The focus of this study is to investigate the variables involved namely inflation rate, interest rate, Growth Domestic Product (GDP), exchange rate, market capitalization and turnover. This Chapter also discuss on the underpinning theoretical model and the supporting theoretical models.

#### **2.1 Literature Review**

A literature review is a logical review report and finding from the previous study on the related theory. This review and finding will assist the future researcher to have an idea on the choosing the related variable, hypothesis and theory to have a better development on the related topic.



### 2.1.1 Stock Market Performance

According to Tang, Habibullah & Pua (2007), to have a good decision making on the stock market is needed to have a good knowledge on the behavior of stock market and other factors that will give an impact directly or indirectly to the stock market. Normally, the return from stock market is derive from the dividend and capital gain. With the good understanding on the stock market behavior especially on the macroeconomic will assist the investor to forecast the future value and market trend.

In addition, from Tetlock, (2007) said that other than the good return of the corporation listed in the stock market, any related information that will affect directly or indirectly on the stock market will influence on the decision made by the investor. In order to have a quick and fast decision on the stock market it is necessary to ensure all the information is faster to understand and faster to digest. It is to give a change to the investor to get the benefit from the situation rather lose the opportunity.

Furthermore, other than related information, the stock market also can be influence by the investor and market sentiment. It was approved by the finding from Zouaoui, Nouyrigat & Beer (2010) that the investor and market sentiment giving a positive relationship on the stock market. It supported on how importance to have a good knowledge on the factors that will pressure on the stock market.

Lastly from Ng Siew Wen & friends' study in 2015, was conclude that market performance is the main indicator to develop the confidence of the investor and as a reference to forecast the future trend and development. From that investor can have a good capital gain.

### **2.1.2 Interest Rate**

Interest rate is identified as an essential economic variable which can give a positive pressure on the economic. In general, interest rate is classified as the cost of capital, it is also to assist investor on the decision on having a capital on their investment. It can be seen from the point of view of lender and borrower. For the borrower, interest rate is recognised as the cost which is the borrower need to pay the interest. While for the lender, interest rate is recognised as the return or income received from the borrower. In situation when the bank increases the rate for depository, everyone will invest into bank rather than stock market that have riskier.

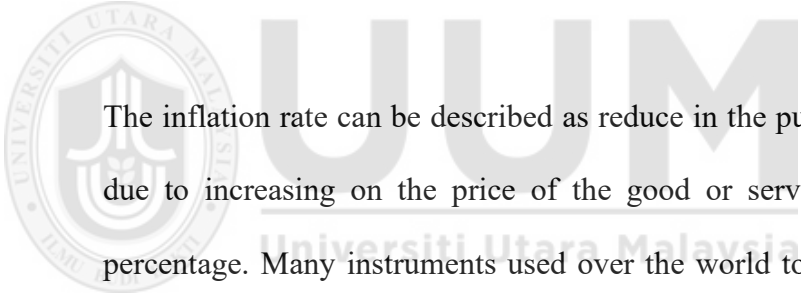
From the study by Ratanapakorn and Sharma, (2007), they conclude that interest rate is having a positive and negative impact on the stock market based on the consensus finding from another researcher. While, in addition, according to Maysami, Lee & Hamzah, (2004) study conclude that interest rate has a short- and long-term different impact on the stock market. It is influence by the other alternative investment

rather than stock market where investor always considered on the cost of investment.

The addition to support this related topic, the study from Erdogan and Ozlale (2005), conclude that changes in interest rate and exchange rate give an impact toward the movement in the stock market.

Again, it proves that to have a good understanding of the behaviour of interest rate and stock market is important to assist the investor.

### **2.1.3 Inflation Rate**

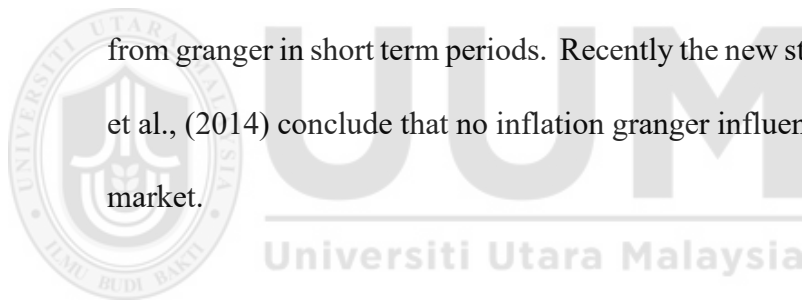


The inflation rate can be described as reduce in the purchasing power due to increasing on the price of the good or services in term of percentage. Many instruments used over the world to explain on the inflation rate, the most comment instrument is the Consumer Prices Index (CPI). This instrument measure the combination of various cost of items of good and services in one basket and it can be fixed or non-fixed items. International Monetary Fund [IMF], (2004).

The study from Barasa Job Wanjala (2014), said that the result from the change of inflation rate can be significant or insignificant towards the stock market. The significant negative value is comprising the depreciation in value of money over the time. It will give an impact on

the result or decision made by the investor on the investment and saving issues.

Granger causality test is normally used by the researcher to test on the relationship of this related variables. According to Garza-Garcia and Yue (2010), they found a positive relationship between inflation and stock price in China by using Granger Causality test. Next, from Ali (2011), the study on Dhaka Stock Exchange (DES) concludes that there is insignificant relationship of the related variable towards the stock market. Another study by Mohd Thas Thaker, Rohilina, Hassama and Amin, (2009) conclude that Athen stock market influenced by inflation from granger in short term periods. Recently the new study from Kibria et al., (2014) conclude that no inflation granger influences on the stock market.



A lot of studies was discussing on the relationship of inflation rate toward the stock market performance, and it was supporting this study to examine the relationship to have a clear understanding on this relationship between inflation rate and the stock market performance.

#### **2.1.4 Gross Domestic Product**

Gross domestic product (GDP) is a popular method used by the countries to calculate the income and output of the economic. It comprised of a total market value of all the final goods and services

produced by labour in an economic at a specified time frame. Explain by Kira, (2013).

For instance, Patel (2012) from the study found that there is a significant positive impact of this variable and stock market return. It describes as increase in production will result on the highest revenue however, it is also increase in the cashflows volume. The finding from Ritter (2005), was contrary, where the finding explains the relationships between equity return and this related variable is from the several countries under the examination.

As a conclusion, GDP also may have an impact positive or negatively between the stock market and this variable. It makes this study is relevance to understand the relationship exist.

### **2.1.5 Exchange Rate**

Exchange rate can be explaining from the dealer perspective as a direct or indirect quote. The value of external currency of one country and denominated on the local currency it defined as direct quote. While for indirect quoted is the local currency in denomination of external currency.

According to Pramod and Puja (2012), explain that the international trade market is effect to the movement of exchange rate very

significantly. That means the huge impact of exchange rate is dependent on active or inactive value trade on the international market.

Additionally, to measure this variable is by comparing the two currencies of two country. It also known as ratio of currency like mention by Aslam, (2014). To trigger the relationship of the variable is attract others researcher to have a look and to examine this topic to have a good and better understanding on the existing of the relationship.

Malaysia stock market in the long run have a significant relationship with the exchange rate, it proves by the study from Aisyah, Noor Zahirah and Fauziah in (2009). It consistent with the finding Hussain and Mohamed Ibrahim in (2012) which mention other than long run-in short run Malaysia stock market also impacted from this variable.

Interest rate may have a significant or insignificant relationship between the stock market performance. It makes this study is relevance to understand the relationship exist.

#### **2.1.6 Market Capitalization**

Market Capitalization: Market value is one of the most important indicators pointing to the health of companies, and an important indicator for measuring the efficiency and development of markets as refer to study from Juaijati & Rafiaa, (2007).

According to Ime T. Akpan (2013), the study on the performance of Nigerian economy, the finding concludes that the significant relationship of this variable towards the Nigerian economy is exist. This study was done in 1988 to 2008 as the sample data.

### **2.1.7 Turnover**

In stock market, turnover is a volume of stock that traded on the stock market at the specific time. The study from Lawrence Blume, David Easley & Maureen O'hara (1994) have study on the effect of volume, accurate information and price movement on the stock market. The study needs to understand on how this think can reflect to the stock performance and can be used by investor in making their decision for future investment.

As refer to previous study from other researcher, volume of stock market is playing an important key. It proved by the study from Gallant, Rossi, and Tauchen in 1992 and by Karpoff in 1987. It concludes the volume and the share price movements giving a very positive relationship in equity and futures markets.

Among previous studies of this turnover or market volume, Schwert (1990) has study on the correlation on volume or volatility for the S&P500 Index on the stock market and future volume. The finding

show that the relationship is exist where, when the volume is of S&P500 is high the volume of stock market and future also high. However, in 1989, Smith was found that S&P 500 future volume had no impact from the volatility of S&P 500 index return. This is supported by the finding from Santoni (1987), Darrat and Rahman (1995) and Bessembinder and Seguin (1992) there is negative relationship of this variable on the stock market.

## **2.2 Theoretical Review**

Theoretical review is the theoretical as the foundation of a study. The theory and the hypothesis of this study will determine of this theoretical research. The previous study on this related topic was based on the testing, knowledge, and valuation at that time. However, this study is doing based on the existing theory and the previous study on this related topic. The underpinning theory of this study is the Market Efficiency Theory, while the supporting theory is Arbitrage Pricing Theory.

### **2.2.1 Market Efficiency Theory**

The efficient market hypothesis (EMH), or efficient market theory, is a hypothesis that explain the share prices reflect on all the information. It is impossible in consistent generating alpha. This theory is highly controversial and always being discussing.



The points that always being be discuss is to search for the undervalued stock through technical or fundamental analysis to forecast the future trends on the market. If it can consistently evaluate the risk -adjusted excess returns (alpha) doesn't matter it is technical or fundamental analysis.

Along with that, this theory was defined that how the stock market is reflecting on all information. It can be understood that the information like macroeconomic variables can determinant the performance of the stock market. From here, this hypothesis was required the researcher to study on the factors that can influence the stock market.

### 2.2.2 Arbitrage Pricing Theory

As explain by Ross (1976), this theory is referring to the expectation of the asset or portfolio return on the effect or the selected variable on the stock market. This assumption is an auxiliary to evaluate the stock performance as mentioned by Kuwomu & Owusu-Nantwi, (2011).

This theory is formulated as below:

$$E(r_j) = r_f + b_{j1}RP_1 + b_{j2}RP_2 + b_{j3}RP_3 + b_{j4}RP_4 + \dots + b_{jn}RP_n$$

Where:

$E(r_j)$  = the expected return of asset or portfolio investment

$r_f$  = the risk-free rate

$b_j$  = the sensitivity of the asset return to the particular factor

RP = the risk premium associated with the particular factor

According to Iqbal and Haider (2005), this theory is to develop the stock return using the model function to identify the effect of all variables. All the market balancing will interpret from this model to see the connection from the independent variable and the dependent variable will taking into consideration of all risk direct or directly with expectation no arbitrage profit. Explain by Roll & Ross, (1980).



## CHAPTER 3

### RESEARCH METHODOLOGY

#### **3.0 Introduction of Research Methodology**

This study aims to understand the relationship between macroeconomic variable towards the stock market performance of FTSE Bursa Malaysia KLCI index. There are four macroeconomic variables namely inflation rate, interest rate, Growth Domestic Product (GDP) and exchange rate. This study also examined the relationship of the control variable namely Market Capitalization and Turnover towards the stock market performance. This study was conducted quantitatively, and it used statistical instrument to analyze its data.

The research methodology provides a design on how to gather the data and analyzed it using specific method. From this chapter, it will explain the methodology used to in conducting this study and will be highlighting on the research framework, hypothesis, research design, data processing and data technique analysis.

#### **3.1 Research Framework**

As refer to the literature review discussed in the last chapter and suggestions by several studies, this study has developed a framework. Firstly, independent variables which are four macroeconomic variables namely interest rate, inflation rate, Growth Domestic Product (GDP) and exchange rate. Secondly,

the control variable are market capitalization and turnover. Thirdly, the dependent variable is the stock market performance: FTSE Bursa Malaysia KLCI index.

The following conceptual framework is developed based on the literature review with the intention of answering the research questions and meeting the research objectives.

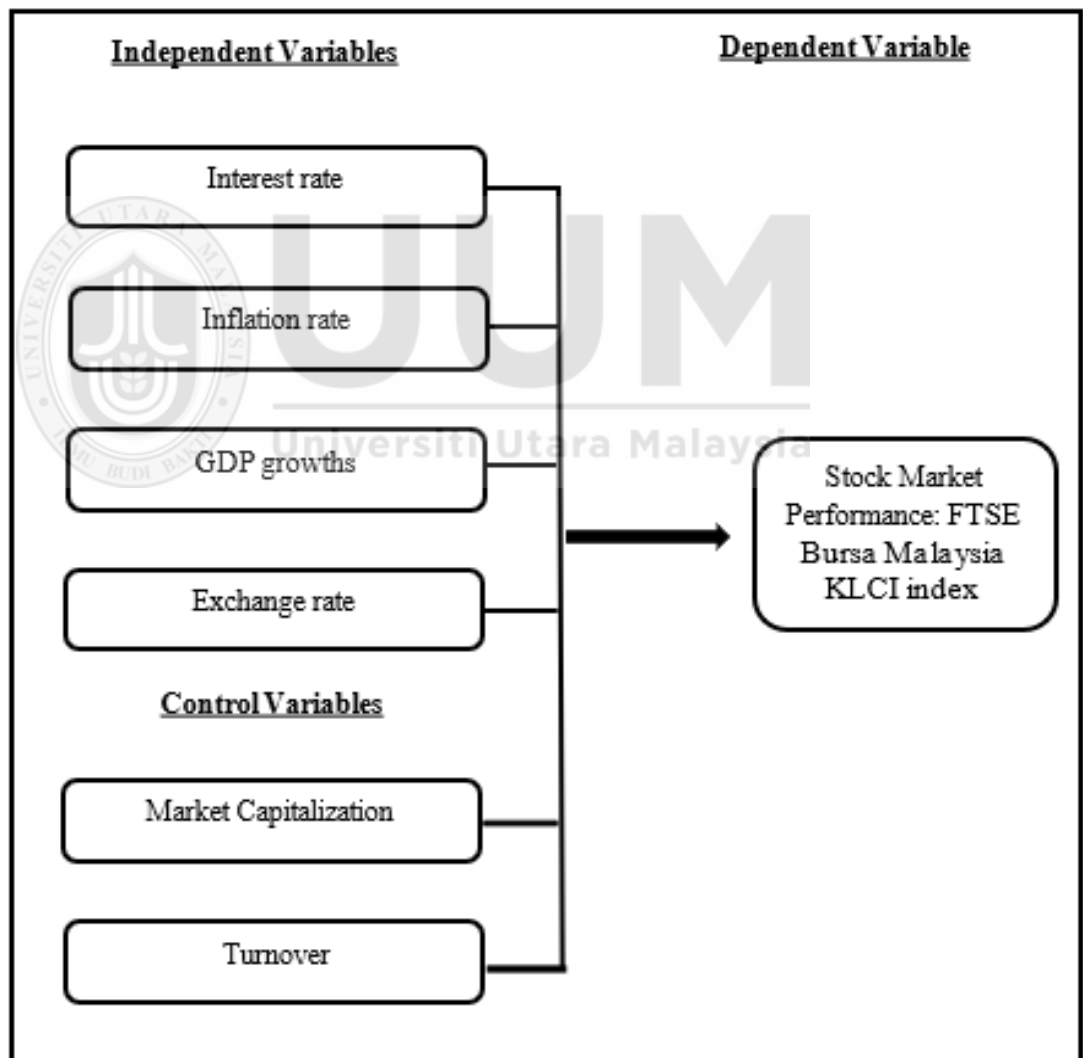


Figure 3.1  
*Conceptual Framework*

## 3.2 Hypothesis

These following generated hypotheses are hereby proposed to test the relationship between all the independent variable of this study and the market capitalization and turnover as the control variable towards the FTSE Bursa Malaysia KLCI index. The summary of hypotheses that were formulated for the present study as follows:

**H1:** There is significant relationship between Interest Rate and stock market performance among FTSE Bursa Malaysia KLCI index.

**H2:** There is significant relationship between Inflation Rate and stock market performance among FTSE Bursa Malaysia KLCI index.

**H3:** There is significant relationship between GDP and stock market performance among FTSE Bursa Malaysia KLCI index.

**H4:** There is significant relationship between Exchange Rate and stock market performance among FTSE Bursa Malaysia KLCI index.

**H5:** There is significant relationship between Market Capitalization and stock market performance among FTSE Bursa Malaysia KLCI index.

**H6:** There is significant relationship between Turnover and stock market performance among FTSE Bursa Malaysia KLCI index.

### **3.3 Research Design**

Research design is one of the significant master plans related to the collection, measurement and analysis of data which depends on the research questions developed for the study (Sekaran & Bougie, 2013). Besides, this process is crucial in ensuring that the data that will be using is capable in providing the valid and reliable answer for the researchers.

This section will be further discussing on the type of study, data sources, unit of analysis and population of frame.

#### **3.3.1 Type of Study**

The nature of this study is quantitative design which investigates the relationship between the independence variables from macroeconomic of interest rate, inflation rate, GDP and exchange rate, the control variable of market capitalization and turnover and the dependence variables is the stock market performance: FTSE Bursa Malaysia KLCI index.

According to Sekaran, Robert and Brain (2001), as for social sciences and business-related field, quantitative is a suitable and common use for the empirical evidence, besides, being able to determine and validate the connection between the variables (Leedy & Ormond, 2005).

### 3.3.2 Source of Data

This study uses a secondary data. All the data are collected based on annually basis from year 1990 to 2020. The detail of the source of data is stated in table below:

Table 3.1

*Source of data*

<b>Independent/ dependent Variables</b>	<b>Proxy</b>	<b>Units</b>	<b>Details</b>	<b>Data Source</b>
Stock Market Performance	FTSE Bursa Malaysia KLCI Index	Index	FTSE Bursa Malaysia KLCI Index using the closing index.	Bloomberg
Interest Rate	Overnight Policy Rate (OPR)	Percentage	OPR based on the announcement by BNM after the Monetary Policy Committee (MPC) meeting.	Bank Negara Malaysia (BNM)/ Bloomberg
Inflation Rate	Consumer Price Index (CPI)	Percentage	Inflation is an increasing of the prices of goods and services.	Department of Statistics, Malaysia / Bloomberg
GDP	Gross Domestic Product (GDP)	Percentage	GDP is the total monetary or market value of all the finished goods and services produced	Central bank of Malaysia (Bank Negara Malaysia- BNM)/ Bloomberg

<b>Independent/ dependent Variables</b>	<b>Proxy</b>	<b>Units</b>	<b>Details</b>	<b>Data Source</b>
Exchange Rate	Exchange Rate-Currency	RM/USD	Direct quote of Ringgit Malaysia per US Dollar.	Bank Negara Malaysia-(BNM)/Bloomberg
Market Capitalization	Market size of FTSE Bursa Malaysia KLCI Index	RM	Total market value of a company's equity listed on the FTSE Bursa Malaysia KLCI Index	Bloomberg
Market Turnover	Market volume	Unit	Total volume traded on the FTSE Bursa Malaysia KLCI Index.	Bloomberg

This study also refers to the additional informations in collecting the data for each variable likes journals, articles, official website and text books. It is as an additional information related to this topic to support all the variable.

### **3.3.3 Unit of Analysis**

For this study, unit of analysis involved is individual level that indicates the data collected from the secondary data and will be analyzed, and the result will be treated as an individual data source.



### 3.3.4 Population of frame

This study focusses to examine on the relationship between the macroeconomic variable as the independent variable towards the stock market performance of FTSE Bursa Malaysia KLCI index as the dependent variable. The selected macroeconomic variable as an independent variables are interest rate, inflation rate, Growth Domestic Product (GDP) and exchange rate. This study also examining the relationship between control variable namely market capitalization and turnover towards the stock market performance of FTSE Bursa Malaysia KLCI index. FTSE Bursa Malaysia KLCI index is consisting of 30 top companies in Malaysia. The data of this study is collecting by annually basis from year 1990 to 2020.

## 3.4 Data Processing

On the other hand, the data of all variables was collected from the Bloomberg and official website of Bank Negara Malaysia and Department of Statistics, Malaysia. The input will be sorting in the Microsoft Excel. After that the input will be transfer into E-Views 10 for diagnostic checking and hypothesis testing.

The data processing's flow is shown as follows:

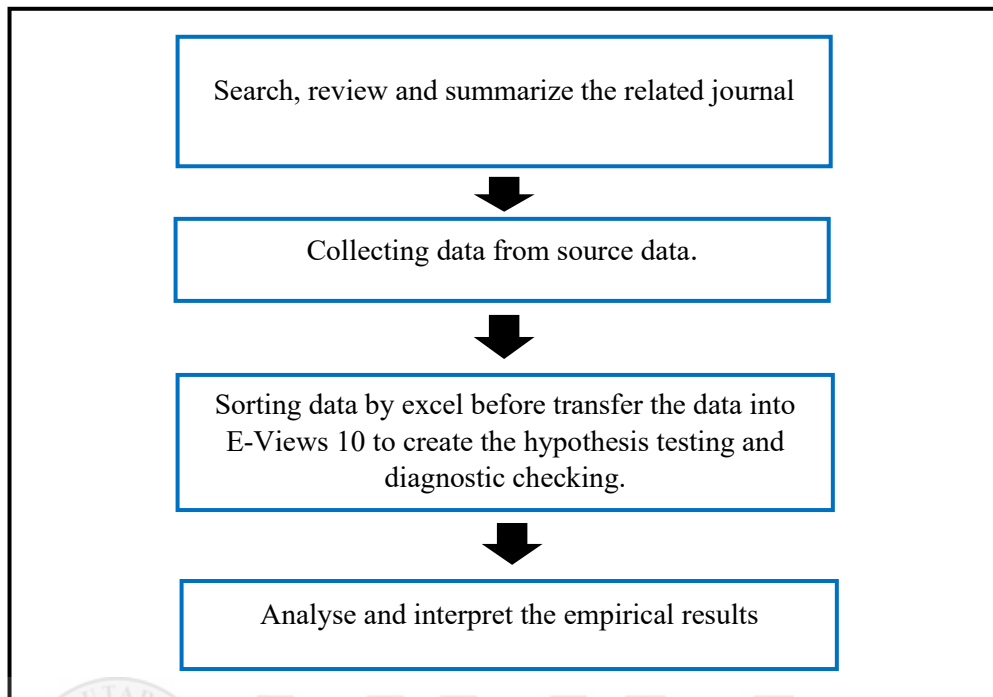


Figure 3.2  
*Data Processing Diagram*

### 3.5 Data Techniques Analysis

Several data analysis techniques will be applied in order to reach the conclusion besides determining the connection among the related variables (Neuman, 2000). As per Mugenda and Mugenda (2003) explain that the input should clear, rearrange and accurately evaluate to make sure the relevance and accurate information. For this study, statistical analysis will be practices using the E-Views 10. The finding from this study will be summarized in the table and explain briefly.

### 3.5.1 Multiple Linear Regression Model

According to Cohen, Cohen, West and Aiken (2003), this Model is containing two or more independent variables to forecast the determinants' impact on the dependent variable.

The model of this study is as follow:

$$\begin{aligned} \text{LKLCI} = & \text{C(1)*LCPI} + \text{C(2)*LEXCHANGERATE} + \text{C(3)*LGDP} \\ & + \text{C(4)*LI} + \text{C(5)*LMCAP} + \text{C(6)*LT} + \text{C(7)} \end{aligned}$$

Where:

**LKLCI** = FTSE Bursa Malaysia KLCI index performance

**LCPI** = Inflation rate

**LEXCHANGERATE** = Exchange rate

**LGDP** = Growth Domestic Product rate

**LI** = Interest Rate

**LMCAP** = Market Capitalization of FTSE Bursa Malaysia KLCI

**LT** = Market Turnover of FTSE Bursa Malaysia KLCI

**C** = Intersect Value

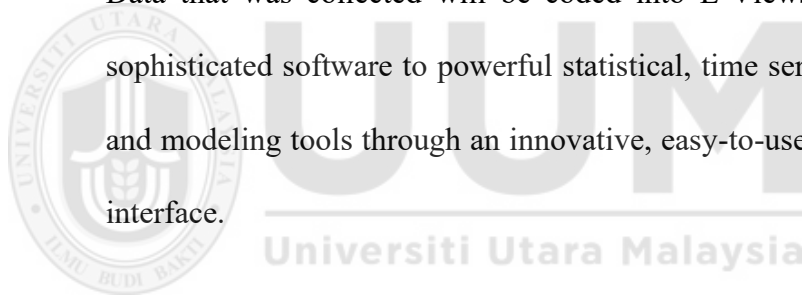
### 3.5.2 Ordinary Least Square

Ordinary Least-Square (OLS) regression is a generalized linear modelling technique which is used to estimate the figures of the

parameters to fit a function to a set of data. This regression is widely used and can be easily adapted to include a number of explanatory variables, including dummy variables (Hutcheson & Moutinho, 2011). In other words, OLS regression is applicable to a single explanatory variable, multiple explanatory variables, and categorical explanatory variables.

### 3.5.3 E-Views 10

Data that was collected will be coded into E-Views. E-Views is a sophisticated software to powerful statistical, time series, forecasting, and modeling tools through an innovative, easy-to-use object-oriented interface.



To run all the checking and testing, this study was used E-Views 10. The diagnostic checking and hypothesis were run on T-statistics test (T-Test), F-statistic test, (F-Test), Multicollinearity, Heteroskedasticity (ARCH), Autocorrelation (Breusch-Godfrey) and Normality Test - Jarque-Bera. This is using Ordinary Least Square Method.

### 3.5.4 Diagnostic Checking

#### 3.5.4.1 Normality Test- Jarque-Bera Test

To test on the normality distribution of the data the best test or diagnostic is using Jarque-Bera test. It is proposed by Jarque and Bera (1987) and gained a huge acceptance among the econometricians. The test is based on the sample of skewness (S) and kurtosis (K) of the OLS model. The test statistic formula is shown as below:

$$JB = \left[ \frac{S^2}{6} + \frac{(K-3)^2}{24} \right]$$

#### 3.5.4.2 Multicollinearity

As explained by Adeboye, Fagoyinbo & Olatayo, (2014), when 2 or more than the variables have a high correlation with each other it may trigger a multicollinearity problem happened on the model.

There is various method to checked on the existing of multicollinearity problem on the model. Firstly, if the R-Square is higher with a few significant T- Ratios can trigger to have multicollinearity. Secondly, look at the correlation coefficients test. The multicollinearity problem is detecting when the result is same as 0.7 or more as suggest by Yu, Jiang and Land (2015).

Thirdly, multicollinearity problem can be detecting from Variance Inflation Factor (VIF) and Tolerance (TOL). According to Akinwande, Dikko and Samson (2015), the value of VIF should be below than value 10. If the value of VIF is more than 10 it will trigger to have a multicollinearity problem. While, for TOL, the value should be far from 0, if the value is near to 0 it will trigger the model have this problem. The formula of VIF and TOL are as followed:

$$VIF_j = \frac{1}{1 - R_j^2} \qquad TOL_j = \frac{1}{VIF_j}$$

#### 3.5.4.3 Heteroscedasticity

Heteroskedasticity refers to the inconsistent variance in a regression model. The behaviour of the variance is depending on the revision. However, the variability is depending on the mean of the data or depends on one or more explanatory variables as explain by Payne, (2014).

In addition, Gujarati and Porter (2009) also mentioned that to test the existing heteroscedasticity in the model, there are 2 methods. Normal and abnormal way. For normal way is used a graph method. While for abnormal way is using the formal test likes Breusch-Pagan test, Glesjer test, Harvey-Godfrey test, Park test, Goldfeld-Quandt test, ARCH test and White's test.

To test the Heteroskedasticity on this model, this study is chosen ARCH Test. The hypotheses are as follows:

H<sub>0</sub>: There is no heteroscedasticity problem.

H<sub>1</sub>: There is heteroscedasticity problem.

The significant level is 0.05 or 5%. The decision rule is to reject H<sub>0</sub> if the probability value is < than the significant level,  $\alpha = 0.05$ . Otherwise, do not reject the H<sub>0</sub>.

#### 3.5.4.4 Autocorrelation

Autocorrelation problem is identified when there is a nonzero covariance of the variable exist in the model. In simple word, there is relationship among the error terms. As explain by Gujarati and Porter (2009).

To detect the autocorrelation problem, there are several tests can be used as describe in the Figure 5.

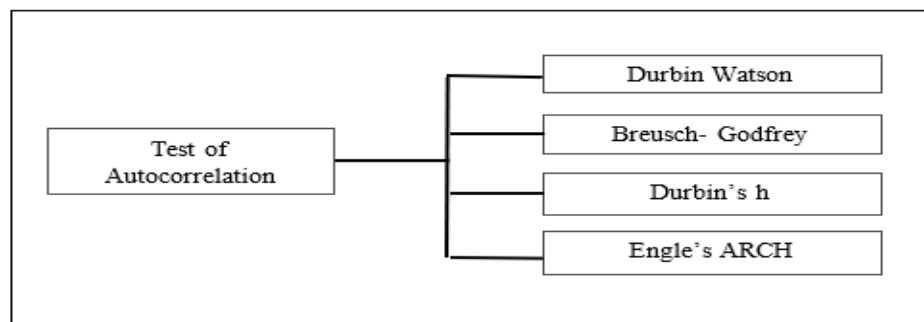


Figure 3.2  
*Autocorrelation Problem Detection Test*

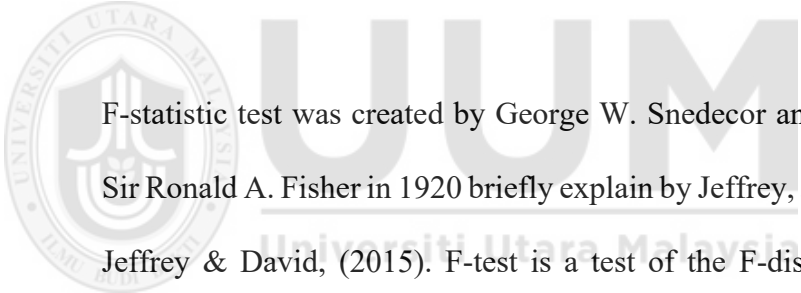
This study applied a Breusch-Godfrey Test. The hypotheses for this test are as follows:

H<sub>0</sub>: No autocorrelation problem.

H<sub>1</sub>: Have an autocorrelation problem.

The significant level is 0.05 or 5%. The decision rule is to reject H<sub>0</sub> if the probability value is lower than the significant value. Otherwise, do not reject the H<sub>0</sub>.

### 3.5.5 F- Test



F-statistic test was created by George W. Snedecor and developed by Sir Ronald A. Fisher in 1920 briefly explain by Jeffrey, James, Michael, Jeffrey & David, (2015). F-test is a test of the F-distribution of the hypothesis of the model. This test will compare the statistical model that has been setting from this model to identify that the data set is fit the population. This test can be run by using E-Views 10. The P-value of F-statistic is generated as a result to be analyse.

The hypothesis for this test is as follows:

H<sub>0</sub>:  $\beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$  (Model is not significant)

H<sub>1</sub>: At least one of the  $\beta_i \neq 0$  (Model is significant)



Where:

$i = 2,3,4,5$

- Reject  $H_0$  if the F-statistic value is lower than critical value at significant level (assume = 0.05). Otherwise, do not reject  $H_0$ .
- Reject  $H_0$  if the P-value is smaller than the significant level (assume = 0.05). Otherwise, do not reject  $H_0$ .

### 3.5.6 T-Test

T-statistic test was developed and introduced by William Sealy Gosset in 1908 and was published under the pseudonym of “Student”. A t-statistic test is any statistical hypothesis test in which the test statistic follows a student’s t-distribution under the null hypothesis. It can be used to determine if two sets of data are significantly different from each other.

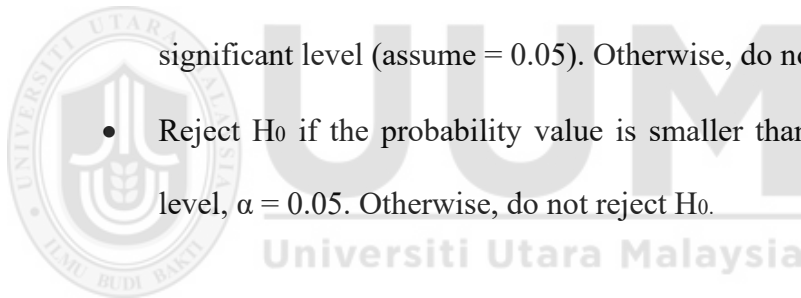
This study, T-statistic test is used to examine whether the independent variables (Inflation rate (CPI), Exchange Rate (EXCHANGERATE), Growth Domestic Product rate (GDP), Interest Rate (I), Market Capitalization (MCAP), Turnover (T)) are individually significant to the dependent variable (FTSE Bursa Malaysia KLCI Index (KLCI)).

This study used E-Views 10 to generate the result on T-Test. The hypotheses for T-test are as follows:

H<sub>0</sub>: There is no significant relationship between the independent and dependent variable.

H<sub>1</sub>: There is a significant relationship between the independent and dependent variable.

- Reject H<sub>0</sub> if F-value is larger than the critical value at a specific  $\alpha$  (significant level assume = 0.05). Otherwise, do not reject H<sub>0</sub>.
- Reject H<sub>0</sub> if F- value is lower than the critical value at a specific  $\alpha$  (significant level assume = 0.05). Otherwise, do not reject H<sub>0</sub>.
- For two-tailed test, reject H<sub>0</sub> if t-statistic value is larger than the upper critical value, or less than lower critical value at a specific significant level (assume = 0.05). Otherwise, do not reject H<sub>0</sub>.
- Reject H<sub>0</sub> if the probability value is smaller than the significant level,  $\alpha = 0.05$ . Otherwise, do not reject H<sub>0</sub>.



### 3.6 Conclusion

As a conclusion, on this chapter has included detail explanations on research framework, hypothesis, research design, data processing and data technique analysis. This chapter clearly explain on the methodology used in evaluate the model and how the result can be analyzing. The result and discussion of the testing will be clearly explained on the next chapter.

**CHAPTER 4**  
**RESULT AND DISCUSSION**

**4.0 Introduction**

This chapter is more on interpreting discussing the finding generating from E-View 10. The result explains or analyze from the Descriptive Analysis, Normality Test and three others evaluation method including Multicollinearity, Heteroscedasticity and Autocorrelation. While the Hypothesis Testing is derived from T-Test and F-Test to evaluate the hypothesis results. The finding will be summarized in the table and briefly describe.

**4.1 Diagnostic Checking**

**4.1.1 Descriptive Statistic**

Table 4.1  
*Descriptive Statistic Analysis*

	<b>LKLCI</b>	<b>LCPI</b>	<b>LEXCHANGE</b>	<b>LGDP</b>	<b>LI</b>	<b>LMCAP</b>	<b>LT</b>
<b>MEAN</b>	7.143891	0.706317	1.299439	1.558938	1.098815	13.42350	24.03194
<b>MEDIAN</b>	7.329624	0.712758	1.332231	1.677053	1.098612	13.58733	24.15932
<b>MAXIMUM</b>	7.532067	1.691939	1.501006	2.001480	1.252763	13.90544	24.74424
<b>MINIMUM</b>	6.471295	-0.400478	1.117925	-0.693147	0.989541	12.55729	23.17214
<b>STD. DEV.</b>	0.363809	0.526035	0.114238	0.579467	0.080957	0.476410	0.446881
<b>SKEWNESS</b>	-0.623524	-0.164428	-0.036351	-3.493362	0.380606	-0.643128	-0.499836
<b>KURTOSIS</b>	1.796943	2.650481	1.992983	14.24802	2.392490	1.921590	2.598343

As refer to Table 2 above, shows the summary of descriptive statistical analysis related to FTSE Bursa Malaysia KLCI (LKLCI) variables. The average LKLCI is 7.143891. The LKLCI reached the bottom of 6.471295 and the hig of 7.532067 from 1990 to 2020 with a standard deviation of 0.363809.

For Inflation Rate (LCPI) variable, the value for 30 years is at the mean, maximum and minimum of 0.706317, 1.691939 and -0.400478 respectively with a standard deviation of 0.526035.

While the average of Exchange Rate (LEXCHANGE) variable is at 1.299439. The highest and lowest of the variable are 1.501006 and 1.117925 respectively. The standard deviation is 0.114238.

For other variable, Growth Domestic Product (LGDP) the mean is 1.558938 and the maximum and minimum value are 2.001480 and -0.693147 respectively. While the standard deviation is 0.579467 being the highest among other variables.

Being the lowest value of standard deviation of 0.080957 the Interest Rate (LI) mean, maximum and minimum value are 1.098815, 1.252763 and 0.989541 respectively.

For the control variable of Market Capitalization (LMCAP) and Turnover (LT), the average value is 13.42350 and 24.03194 each.

While the maximum and minimum value of both control variables are 13.90544, 12.55729 and 24.74424, 23.17214 respectively. The standard deviation is 0.476410 and 0.446881 respectively.

#### 4.1.2 Normality Test- Jarque-Bera Test

##### Hypothesis

H0: The model is normally distributed.

H1: The model is not normally distributed.



##### Significance level

0.05

##### Decision rule

P-value < 0.05, reject H<sub>0</sub>.

P-value > 0.05, Accept H<sub>0</sub>.

## Decision Making

Table 4.2  
*Summary of Normality Test- Jarque-Bera*

	LKLCI	LCPI	LEXCHANGE	LGDP	LI	LMCAP	LT
<b>Jarque-Bera</b>	2.251855	0.172732	0.764527	131.4991	0.711385	2.113066	0.870504
<b>Probability</b>	0.324351	0.917259	0.682315	0.000000	0.700688	0.347659	0.647102
<b>Decision</b>	<b>Accept</b>	<b>Accept</b>	<b>Accept</b>	<b>Reject</b>	<b>Accept</b>	<b>Accept</b>	<b>Accept</b>
<b>Making</b>	<b>H<sub>0</sub></b>	<b>H<sub>0</sub></b>	<b>H<sub>0</sub></b>	<b>H<sub>0</sub></b>	<b>H<sub>0</sub></b>	<b>H<sub>0</sub></b>	<b>H<sub>0</sub></b>

Since the P-value of LKLCI, LCPI, LEXCHANGE, LI, LMCAP and LT are more than 0.05 or 5% of the significant level, accept H<sub>0</sub>. But for LGDP the P-value is less than 0.05 or 5%, so reject the H<sub>0</sub>.



### Conclusion

According to Normality – Jarque-Bera test, the significant value of 0.05 or 5% is explain the data is normally distributed. According to the P-value of each variable shows in Table 3, all the variable data is normally distributed except for one variable namely Growth Domestic Product, (LGD) has a P-value less than 0.05 or 5% of 0.00000.

### 4.1.3 Multicollinearity

#### 4.1.3.1 High R Square

Firstly, as per result on the Appendix 1, the R-squared of this model is high, which is 0.993303 and only 2 significant t-value of the variable

that is LCPI and LMCAP of 0.497948 and 26.32203 respectively. The model is suspecting to have a multicollinearity problem since R-squared is high and a few of significant t-ratios.

#### 4.1.3.2 High Correlation Coefficient

Table 4.3  
*Pair-Wise Correlation coefficients*

	LKLCI	LCPI	LEXCHANGE	LGDP	LI	LMCAP	LT
LKLCI	<b>1.000000</b>	0.006040	-0.071480	0.357625	0.366122	0.990533	0.695140
LCPI	0.006040	<b>1.000000</b>	-0.271607	0.188715	0.399544	0.003736	0.343637
LEXCHANGE	-0.071480	-0.271607	<b>1.000000</b>	-0.188230	-0.123897	0.013700	-0.245314
LGDP	0.357625	0.188715	-0.188230	<b>1.000000</b>	0.192067	0.373346	0.423364
LI	0.366122	0.399544	-0.123897	0.192067	<b>1.000000</b>	0.405711	0.715751
LMCAP	<b>0.990533</b>	0.003736	0.013700	0.373346	0.405711	<b>1.000000</b>	0.721645
LT	0.695140	0.343637	-0.245314	0.423364	0.715751	0.721645	<b>1.000000</b>

Secondly, the model is triggered to have a multicollinearity problem since the correlation coefficients is high. As refer to Table 4, the correlation coefficient of LMCAP and LKLCI is high of 0.990533. Therefore, this model is suspecting to have the multicollinearity problem.

### 4.1.3.3 Variance Inflation Factor (VIF) and Tolerance Factor (TOL)

Table 4.4  
*Summary of VIF and TOL results*

VARIABLES	VIF	TOL
	$VIF_j = \frac{1}{1-R_j^2}$	$TOL_j = \frac{1}{VIF_j}$
C	NA	NA
CPI	1.285046	0.7781823
EXCHANGE RATE	2.627336	0.3806137
GDP GROWTH	1.552287	0.6442108
INTEREST RATE	2.137367	0.4678654
MARKET CAPITAL	2.611644	0.3829006
TURNOVER	2.494323	0.4009104

Thirdly, when (VIF) exceeds 10 and (TOL) closed to 0, the model is triggered to having a serious multicollinearity problem. However, based on Table 5 above, the VIFs obtained for all variables are below than 10, while the TOLs obtained are far from 0.

### **Conclusion**

As a conclusion, this model is do not have a multicollinearity problem even though from this model is having a high R-squared value and high correlation coefficients value. The VIF and TOL value was denied it.



#### 4.1.4 Heteroskedasticity

This study using heteroskedasticity- ARCH model to detecting the heteroskedasticity.

##### Hypothesis

H0: No heteroscedasticity problem.

H1: Have a heteroscedasticity problem.

##### Significance level

0.05

##### Decision rule

P-value < 0.05 = Reject H<sub>0</sub>

P-value > 0.05 = Accept H<sub>0</sub>

##### Decision Making

Table 4.5  
*Heteroscedasticity Test – ARCH*

<b>F-statistic</b>	1.198973	<b>Prob. F (1,14)</b>	0.2920
<b>Obs*R-squared</b>	1.262162	<b>Prob. Chi-Square (1)</b>	0.2612

Since the P-value of 0.2612 is > than the significance level Accept H<sub>0</sub>.

### **Conclusion**

The conclusion is there is no heteroskedasticity problem on this model at the 5% significant level.

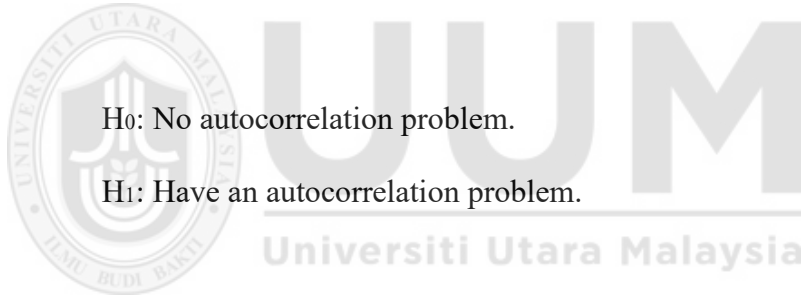
#### **4.1.5 Autocorrelation**

To determinant the existing autocorrelation problem in this study was using Breusch-Godfrey Test.

### **Hypothesis**

H<sub>0</sub>: No autocorrelation problem.

H<sub>1</sub>: Have an autocorrelation problem.



### **Significance level**

0.05

### **Decision rule**

P-value < 0.05 = Reject H<sub>0</sub>

P-value > 0.05 = Accept H<sub>0</sub>

## Decision Making

Table 4.6

*Autocorrelation – Breusch-Godfrey*

<b>F-statistic</b>	1.782033	<b>Prob. F (6,11)</b>	0.1923
<b>Obs*R-squared</b>	8.872294	<b>Prob. Chi-Square (6)</b>	0.1809

Since the P-value is 0.1809 is > than the significance level Accept H<sub>0</sub>.

## Conclusion

As a conclusion, no autocorrelation problem in the model at 5% significance level.

## 4.2 Hypothesis Testing

### 4.2.1 F- Test

## Hypotheses

H<sub>0</sub>:  $\beta_{LCPI} = \beta_{LEXCHANGE} = \beta_{LGDP} = \beta_{LI} = \beta_{LMCAP} = \beta_{LT} = 0$

(Model is not significant)

H<sub>1</sub>: At least one of the  $\beta_i$  not = 0 (Model is significant)

**Significance level**

0.05

**Decision rule**

P-value < 0.05 = Reject H<sub>0</sub>

P-value > 0.05 = Accept H<sub>0</sub>

**Decision Making**

Table 4.7  
*Result of F-Statistic*

<b>F-Statistic</b>	271.9142
<b>Prob (F-Statistic)</b>	0.000000

Since the P-value is 0.000000 is less than the significance level reject H<sub>0</sub>.

**Conclusion**

As a conclusion, this overall model is significant at 5% significance level.

## 4.2.2 T-Test

### Hypothesis

$H_0: \beta_{LCPI} = \beta_{LEXCHANGE} = \beta_{LGDP} = \beta_{LI} = \beta_{LMCAP} = \beta_{LT} = 0$

(Model is not significant)

$H_1$ : At least one of the  $\beta$  not = 0 (Model is significant)

### Significance level

0.05

### Decision Rule

P-value < 0.05 = Reject  $H_0$

P-value > 0.05 = Accept  $H_0$

### Decision Making

Table 4.8  
*T-Statistic and P-value result*

	<b>T-Statistic</b>	<b>Prob.</b>	<b>Decision Making</b>	<b>Conclusion</b>
<b>LCPI</b>	0.497948	0.6283	$P > 0.05$	Accept $H_0$
<b>LEXCHANGE</b>	-4.024250	0.0020	$P < 0.05$	Reject $H_0$
<b>LGDP</b>	-0.950102	0.3625	$P > 0.05$	Accept $H_0$
<b>LI</b>	-0.677124	0.5123	$P > 0.05$	Accept $H_0$
<b>LMCAP</b>	26.32203	0.0000	$P < 0.05$	Reject $H_0$
<b>LT</b>	-1.451231	0.1746	$P > 0.05$	Accept $H_0$
<b>C</b>	-2.260223	0.0451	$P < 0.05$	Reject $H_0$

### **Inflation Rate (LCPI)**

P-value is 0.6283 is > than 0.05, accept  $H_0$ .

### **Exchange Rate (LEXCHANGE)**

P-value is 0.0020 is < than 0.05, reject  $H_0$ .

### **Growth Domestic Product (LGDP)**

P-value is 0.3625 is > than 0.05, accept  $H_0$ .

### **Interest Rate (LI)**

P-value is 0.5123 is > than 0.05, accept  $H_0$ .

### **Market Capitalization (LMCAP)**

P-value is 0.0000 is < than 0.05, reject  $H_0$ .

### **Turnover (LT)**

P-value is 0.1746 is > than 0.05, accept  $H_0$ .

### **Conclusion**

As a conclusion, there are insignificant relationship between Inflation Rate (LCPI), Growth Domestic Product (LGDP), Interest Rate (LI) and Turnover (LT) towards the FTSE Bursa Malaysia KLCI index (LKLCI). While there is significant relationship between Exchange

Rate (LEXCHANGE) and Market Capitalization (LMCAP) towards the FTSE Bursa Malaysia KLCI index (LKLCI).

### 4.3 Summary of Statistical Analysis

Table 4.9  
*Diagnostic Analysis's summary*

<b>Diagnostic checking</b>	<b>Result</b>
Normality Test- Jarque-Bera Test	The error term is normally distributed except for one variable (LGDP)
Variance Inflation Factor (VIF)	No serious multicollinearity problem
Tolerance Factor (TOF)	No serious multicollinearity problem
Heteroskedasticity	No heteroskedasticity problem
Autocorrelation – Breusch-Pagan-Godfrey	No autocorrelation problem

Table 4.9 above is the summary for diagnostic checking result. As a conclusion this model is zero from normality, multicollinearity, heteroskedasticity and autocorrelation problem.

#### 4.4 Discussion of Major Findings

Table 4.10  
*Major Findings Summarization Table*

<b>Variables</b>	<b>P-Value</b>	<b>Result</b>	<b>Relationship</b>
Inflation Rate (LCPI)	0.6283	It is insignificant relationship between Inflation Rate and FTSE Bursa Malaysia KLCI index performance	Positive
Exchange Rate (LEXCHANGE)	0.0020	It is significant relationship between exchange rate and FTSE Bursa Malaysia KLCI index performance	Negative
Growth Domestic Product (LGDP)	0.3625	It is insignificant relationship between Growth Domestic Product and FTSE Bursa Malaysia KLCI index performance	Negative
Interest Rate (LI)	0.5123	It is insignificant relationship between Interest Rate and FTSE Bursa Malaysia KLCI index performance	Negative
Market Capitalization (LMCAP)	0.0000	It is significant relationship between Market Capitalization and FTSE Bursa Malaysia KLCI index performance	Positive
Turnover (LT)	0.1746	It is insignificant relationship between Turnover and FTSE Bursa Malaysia KLCI index performance	Negative

Based on the table 4.10, there are two (2) variables namely Exchange Rate and Market Capitalization are having a significant result towards FTSE Bursa



Malaysia KLCI index. While others four (4) variable are having insignificant result towards FTSE Bursa Malaysia KLCI index.

#### **4.4.1 Inflation Rate**

From this study, it is an insignificant positive impact from this variable towards the FTSE Bursa Malaysia KLCI index performance. This study is consistent with study from Taofik and Omosola in year 2013, Chakravarty and Mitra (2013) and Limpanithiwat and Rungsombudpornkul (2010) suggested that this variable has a positive correlation with the stock market either directly or indirectly.

However, this study is contra with the finding from Kimani and Mutuku (2013), Ali (2011) and Eita (2012). Besides, Geetha, Caroline, Mohidin, Rosle, Chandran, Victoria (2011) confirmed the negative correlation between expected or unexpected of this variable and stock price appeared in the long run. In addition, the study from Chia and Lim (2015), they found that the negative correlation was due to the unexpected changes in the price level during inflation.

#### **4.4.2 Exchange Rate**

From this study determine that this variable is having a significant negative relationship towards FTSE Bursa Malaysia KLCI index performance. These findings are consistent with Kadir, Hazlina,

Zarehan, Therisanyo & Reetsang (2011) where the result state that the correlation between exchange rate and KLCI returns are found to be negative, but significant. It also supports from the finding of Sharifah Zulaikha (2014), conclude that this variable seems to be good indicator on order to stabilize the stock price and targeted more capital inflow to the stock market.

However, this study is contra with the study from Tian and Ma (2010) explain that this variable and the stock market were positively correlated. Furthermore, Najafzadeh, Monjazez and Mamipour (2016) stated that when the exchange rate increases by one unit, on average, the stock returns will increase too, holding other variables constant. It also supports from a study of Kashan Pirzada (2016) on the volatility of US dollar and the impact on the Malaysian stock market found that the USD has a positive correlation with the FBM KLCI. The null hypothesis has been rejected, and the test was statistically significant.

#### **4.4.3 Growth Domestic Product (GDP)**

Growth Domestic Product variable from this study is having an insignificant negative relationship towards the FTSE Bursa Malaysia KLCI index performance. The result is contrary with the other finding on the relationship between GDP and stock market performance, where GDP is significantly and positively impacts on share price index. As mentioned by Almeida (2016) that stock price is a discounting

mechanism of an enterprise value. In other words, stock price is derived from the firm's value plus its future cash flows being discounted to present value. In this context, a growth in firm business value is a more important to influence the stock index than an increase in economic growth.

In addition, Almeida (2016) also said that GDP is explained on how much the value of consumer and government expenses. It does not give a clear picture that this variable can give a good return to the investor if the investor is depending their decision on this variable. It is clear that the stock market performance is more depending on the fundamental of the company listed on the stock market rather than the external factors.

#### 4.4.4 Interest Rate

This study found that interest rate is having an insignificant negative relationship towards the FTSE Bursa Malaysia KLCI index performance. This finding is consistent with the finding from Uma Murthy, Paul Anthony & Rubana ighnesvaran (2017) explain that the return of KLCI stock market is have a significant correlation with this variable.

It also supports by study from Cordelia Onyinyechi Omodero & Sunday Mlanga (2019) on the examination the impact of all related to

economic variables on stock market performance in Nigeria. It found that this name variable is do not have significant influence on share price index.

However, the result from this study is contrary with the result from Nijam et al, (2015) and Golam et al., (2017) where the study provided evidence that this variable is positively influenced on the share prices. This is also in line with the study from Arnes, (2014) and Barno,(2014) that found this variable also have a negative correlation on the stock market in Turkey and Ghana stock market.

#### **4.4.5 Market Capitalization**

This study finding that market capitalization as the control variable to the FTSE Bursa Malaysia KLCI index performance has a significant positive relationship. That mean market capitalization can give a support and can determinant on the stock market.

Study from Ime T. Akpan (2013) on the study found that this variable is has a strong relationship on the Nigerian economic.

#### **4.4.6 Turnover**

Turnover as the control variable of the dependence variable have a results an insignificant relationship toward FTSE Bursa Malaysia KLCI

index performance. That means the turnover of market cannot determinant the stock market. The huge of the volume can be make the stock market trade on the upside or in the downside movements.

Where the turnover of the stock market a determinant by the turnover of the companies listed in the stock market, if the cheaper price of company for example RM0.10 is traded the volume trade is very huge, but it won't give a big impact to the stock market.

It explains in the study from P.A. Geroski & S. Toker (1994), The turnover-of market leaders in UK manufacturing industry, 1979-86 those two benchmarks are developed to help to decide whether observed turnover rates are "high" or "low". As it turns out, actual turnover rates are considerably lower than those generated by both of them, suggesting that market structures in the UK are relatively rigid. A model of firm growth rates is estimated to cast some light on why turnover rates are relatively low, and the results suggest that high advertising and innovation rates amongst top ranked firms help to preserve their place in the top five ranking, despite the fact that firm size displays a weak tendency to regress towards the mean.

#### **4.5 Conclusion**

This chapter is continuing with a diagnostic checking. The diagnostic checking is using the Descriptive Statistic, Normality Test- Jarque- Bera Test, Multicollinearity, Heteroscedasticity/ Heteroskedasticity and Autocorrelation

models. The hypothesis testing is using F-test and T-test. Finally, the evaluation of the result and discussion of the finding are briefly explained in this chapter. While the conclusion, implication, limitation, and recommendations will be discussing in another chapter.



## CHAPTER 5

### CONCLUSION AND RECOMMENDATION

#### 5.0 Introduction

From the last chapter, various examination on the data is doing for this study and a discussion on the major finding also has been discuss. For this chapter, it will start with an implication of the study and then on a limitation and recommendation of this study.

#### 5.1 Summary of finding

Table 5.1  
*Summary of the finding*

Variables	P-Value	Result
Inflation Rate (LCPI)	0.6283	It is insignificant relationship between Inflation Rate and FTSE Bursa Malaysia KLCI index performance
Exchange Rate (LEXCHANGE)	0.0020	It is significant relationship between exchange rate and FTSE Bursa Malaysia KLCI index performance
Growth Domestic Product (LGDP)	0.3625	It is insignificant relationship between Growth Domestic Product and FTSE Bursa Malaysia KLCI index performance
Interest Rate (LI)	0.5123	It is insignificant relationship between Interest Rate and FTSE Bursa Malaysia KLCI index performance
Market Capitalization (LMCAP)	0.0000	It is significant relationship between Market Capitalization and FTSE Bursa Malaysia KLCI index performance
Turnover (LT)	0.1746	It is insignificant relationship between Turnover and FTSE Bursa Malaysia KLCI index performance

According to table 12 above, summary of the finding is there are insignificant relationship between Inflation Rate (LCPI), Growth Domestic Product (LGDP), Interest Rate (LI) and Turnover (LT) towards the FTSE Bursa Malaysia KLCI index (LKLCI). While there is significant relationship between Exchange Rate (LEXCHANGE) and Market Capitalization (LMCAP) towards the FTSE Bursa Malaysia KLCI index (LKLCI).

## **5.2 Implications of Study**

As per explain in the early chapter, this study is to encourage the students to be more excited to find and explore more models or variables to examine the relationship toward the stock market performance. This study will be a guidance and as a reference for the investors or any person that have an interest in stock market to carrying out better and more attractive strategies in triggering the macroeconomic variables (Inflation Rate, Exchange Rate, Growth Domestic Product (GDP) and Interest Rate) towards the stock market performance of FTSE Bursa Malaysia KLCI index. In addition, this study also expected to provide an additional view on the relationship of macroeconomic variable towards the stock market performance as a literature, other than that, it also will be assisting the future research to adopt new approach of exploration for new potential variables.



### 5.3 Limitations of Study

In generating the result, there are some limitations facing from this study. These limitations may disturb on the results obtained. It is necessary to determinant the limitations from this study to ensure the future study will overcome the limitations. The limitations that can be identify from this study are on the frequency of data collection, restriction on the stock market, and restriction on Malaysia stock market.

The input for the variables on this study are collected in yearly basis. However, variables such as exchange rate, market capitalization, turnover and stock market performance are fluctuated daily. While for Inflation Rate is fluctuate every month, and Growth Domestic Product (GDP) and Interest Rate are fluctuating every quarter. The short frequency may not reflect all the volatility of stock market.

The Malaysian stock market performance is measured by using FTSE Bursa Malaysia KLCI index in this study. In fact, many studies on this topic are using KLCI as the indicator of Malaysian stock market performance. However, KLCI is not the perfect indicator to examine all companies in the Malaysian stock market since KLCI only comprises the largest 30 companies is not representing the majority of these companies. Besides, FTSE Bursa Malaysia KLCI index does not comprise of all sectors and the companies selected based on their best performance. Where, each sector and companies might have a different impact from the different macroeconomic variables.

As this study only makes investigation only in Malaysia, the findings and results presented are only useful and helpful for the Malaysian investor and policy only. Understand that different countries have a different status, culture, background, political factors and strength in the industry field that will lead to have a different pattern volatility and function of the data collecting.

#### **5.4 Recommendations for Future Research**

Firstly, the frequency of data collection is recommended to be change to quarterly, monthly, or weekly as a basis for all variables because all the variables have a difference sensitivity on a different frequency. For example, the exchange rate may act more sensitive in daily data rather than on the yearly movement. However, there is always a challenge while collecting secondary data.

Secondly, FTSE Bursa Malaysia KLCI index is only including 30 listed companies and it can't perfectly judge as a perfect indicator for Malaysian Stock market. There are various other indexes that listed in Malaysia Bursa Market. The future researcher should consider testing this topic using other indexes to have a good and best finding to achieve the objective.

Thirdly, in order to make this study a relevance for outside investor, it is recommended to have a comparison with other countries. Besides that, this study can be a reference for the outside investor, researcher and other policy maker on the related topic. It will give a clearer view and enhance understanding on those impacts between countries as well.

Lastly, future researchers are also recommended to include more variable that can be examine to determinant on relationship towards the stock market performance. The more variable being test is more reliance and more of variable we can understand on the relationship. For instance, the stock markets are affected by political uncertainties, behavior of the investor to understand the relationship toward the stock market performance are yet to be studied.

## **5.5 Conclusion**

The main objective of this study is to investigate the relationship between the macroeconomic variables namely interest rate, inflation rate, Growth Domestic Product (GDP) and exchange rate towards the stock market performance of FTSE Bursa Malaysia KLCI index. This study also examines the relationship of the control variable namely market capitalization and turnover towards the stock market performance of FTSE Bursa Malaysia KLCI index. From the empirical result, it showed that two variables were significant while other variables were not. More specifically, there was a significant relationship between exchange rate and market capitalization towards the stock market performance of FTSE Bursa Malaysia KLCI index performance. On the other hand, the inflation rate, Growth Domestic Products (GDP), interest rate and turnover were having an insignificant negative and positive relationship with the stock market performance of FTSE Bursa Malaysia KLCI index.

From the diagnostic check, found that the R-Squared of the results is higher and it is suspected to have a Multicollinearity problem. However, after running the

other diagnostic checking on correlation coefficient, Variance Inflation Factor (VIF) and Tolerance Factor (TOL) this data is do not have a Multicollinearity problem.

Hopefully the findings from this study are useful to assist the better understanding on the relationship of the macroeconomic variable towards the stock market performance of FTSE Bursa Malaysia KLCI index.



## REFERENCES

- Ab Rahman, S. M. B., & Hatta, S. A. B. M. (2013). Macroeconomic variables of stock prices (KLCI). Retrieved September, 30, 2015.
- Aisyah, A. R., Noor Zahirah, M. S., & Fauziah, H. T. (2009). Macroeconomic determinants of Malaysian stock market. *African Journal of Business Management*, 3(3), 95-106.
- Alam, M. M., & Uddin, M. G. S. (2009). Relationship between Interest Rate and Stock Price: Empirical Evidence from Developed and Developing Countries. *International Journal of Business and Management*, 4(3), 43- 51.
- Aziz, R. N. A. R., & Azmi, A. (2017). Factors affecting gross domestic product (GDP) growth in Malaysia. *International Journal of Real Estate Studies*, 11(4), 61-67.
- Andale. (2016). Jarque-Bera Test. Retrieved from <http://www.statisticshowto.com/jarque-bera-test/>.
- Adeboye, N. O., Fagoyinbo, I. S., & Olatayo, T. O. (2014). Estimation of the effect of multicollinearity on the standard error for regression coefficients. *Journal of Mathematics*, 10(4), 16-20.
- Akinwande, M. O., Dikko, H. G., & Samson, A. (2015). Variance Inflation Factor: As a condition for the inclusion of suppressor variable(s) in regression analysis. *Open Journal of Statistics*, 5, 754-767.
- Arnes, S. K. (2014). Impact of macroeconomic indicators on stock market performance: The case of the Istanbul Stock Exchange. M.Sc. Thesis submitted to Copenhagen Business School.

- Barasa, J. W. (2014). *Macro-economic determinants of stock market performance in Kenya: case of Nairobi securities exchange* (Doctoral dissertation, University of Nairobi).
- Bekhet, H. A., & Mugableh, M. I. (2012). Investigating equilibrium relationship between macroeconomic variables and Malaysian stock market index through bounds tests approach. *international Journal of Economics and finance*, 4(10), 69-81.
- Billi, R. M., & Kahn, G. A. (2008). What is the optimal inflation rate?. *Federal Reserve Bank of Kansas City Economic Review*, 93(2), 5-28.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.
- Cordelia Onyinyechi Omodero & Sunday Mlang (2019), Evaluation of the Impact of Macroeconomic Variables on Stock Market Performance in Nigeria, *Business and Management Studies*, Vol. 5, No. 2; June 2019, ISSN: 2374-5916 E-ISSN: 2374-5924, Published by Redfame Publishing. URL: <http://bms.redfame.com>
- Erdogan, E., & Ozlale, U. (2005). Effects of Macroeconomic Dynamics On Stock Returns: Case of Turkish Stock Exchange Market. *Journal of Economic Corporation*, 26(2), 69-90.
- Fama, E. F. (1965). Random walks in stock market prices. *Financial Analysts Journal*, 21(5), 55-59.
- Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance*, 25(2), 383-417

- Gitman, L. J. & Zutter, C. J. (2012). *Principles of Managerial Finance* (13th ed.). Boston: Pearson Addison Wesley growth in selected Asian countries.
- Gujarati, D. N., & Porter, D. C. (2009). *Basic Econometrics* (5th ed.). USA: McGraw-Hill.
- Greene, W. H. (2003). *Econometric analysis*. New Jersey, United States: Pearson Education LTD.
- Golam, M., Wali, U., Ashraful, I., Alam, S., & Khan, K. (2017). Effect of macroeconomic variables On stock market performance of SAARC countries. *Asian Economic and Financial Review*, 7(8), 770-779. <https://doi.org/10.18488/journal.aefr.2017.78.770.779>
- Gan, C., Lee, M., Yong, H. H. A., & Zhang, J. (2006). Macroeconomic Variables and Stock Market Interactions: New Zealand Evidence. *Investment Management and Financial Innovations*, 3(4), 89-101.
- Geetha, C., Mohidin, R., Chandran, V. V., & Chong, V. (2011). The relationship between inflation and stock market: Evidence from Malaysia, United States and China. *International journal of economics and management sciences*, 1(2), 1-16.
- Hannesson, R. (2009). Energy and GDP growth. *International Journal of Energy Sector Management*.
- Hoong, T. B., & Omar, E. Z. (2013). An Investigation of Stock Price Determinants: Case of MALAYSIA. *Journal of Contemporary Issues and Thought*, 3, 105-113.

- Hussain, M., & Mohamed Ibrahim, D. (2012). Impact of exchange rate on foreign direct investment in Pakistan. *Advances in Economics and Business*, 2(6), 223-231
- Hutcheson, G. D., & Moutinho, L. (2011). *The SAGE dictionary of quantitative management research*. London, United Kingdom: SAGE Publications Ltd.
- Hutcheson, G. D., & Sofroniou, N. (1999). *The multivariate social scientist*. London, United Kingdom: SAGE Publications Ltd.
- Hossain, M. E. (2012). Inflation and economic growth in Bangladesh. *Journal of Arts, Science & Commerce*, 3(4), 85-92.
- Ibrahim, M. H., & Aziz, H. (2003). Macroeconomic variables and the Malaysian equity market. *Journal of economic studies*.
- Ime T. Akpan Department of Banking and Finance University of Uyo, P.M.B 1017 Uyo - Akwa Ibom State, Nigeria. *Research Journal of Finance and Accounting, ISSN 2222-1697 (Paper) ISSN 2222-2847 (Online), Vol.4, No.19, 2013*.
- Jamaludin, N., Ismail, S., & Ab Manaf, S. (2017). Macroeconomic variables and stock market returns: Panel analysis from selected ASEAN countries. *International Journal of Economics and Financial Issues*, 7(1).
- Jain, Prem C., and Gun-Ho Joh, "The Dependence Between Hourly Prices and Trading Volume," *Journal of Financial and Quantitative Analysis*, XXIII (1988), 269-83.
- Jarque, C. M., & Bera, A. K. (1987). A test for normality of observations and regression residuals. *International Statistical Review*, 55, 163–172.



- Jarvis, C. B., Mackenzie, S. B., & Podsakoff, P. M. (2003). A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of Consumer Research*, 30, 199-218.
- Jeffrey, D. C., James, J. C., Michael, J. F., Jeffrey, W. O. & David, R. A. (2015). *Essentials of business analytics*. Stamford, CT: Cengage Learning.
- Kalam, K. K. (2020). The Effects of Macroeconomic Variables on Stock Market Returns: Evidence from Malaysia's Stock Market Return Performance. *Journal of World Business*, 55, 101076.
- Kitov, I. O. (2008). GDP growth rate and population. arXiv preprint arXiv:0811.2125.
- Kwong, S. M., Tan, H. S., Tan, H. S., Tan, X. Y., & Tung, M. Y. (2017). Determinants of Stock Market Performance in Malaysia (Doctoral dissertation, UTAR).
- Kadir, H. B. A., Selamat, Z., Masuga, T., & Taudi, R. (2011). Predictability power of interest rate and exchange rate volatility on stock market return and volatility: evidence from bursa Malaysia. In *International Conference on Economics and Finance Research IPEDR (Vol. 4)*.
- Lawrence Blume, David Easley & Maureen O'hara (1994), *Market Statistics and Technical Analysis: The Role of Volume*. *The Journal Of Finance* Vol. Xlix, No. 1 March 1994.
- Limpanithiwat, K., & Rungsombudpornkul, L. (2010). Relationship between inflation and stock prices in Thailand.
- Modigliani, F., & Sutch, R. (1966). Innovations in interest rate policy. *The American Economic Review*, 56(1/2), 178-197.

- Moya-Martínez, P., Ferrer-Lapena, R., & Escribano-Sotos, F. (2015). Interest rate changes and stock returns in Spain: A wavelet analysis. *BRQ Business Research Quarterly*, (18), 95-110.
- Mulherin J. Harold, and Mason S. Gerety, "Daily Trading Volume on the NYSE During the Twentieth Century," unpublished paper, Clemson University, 1989.
- MSCI (2010). Is There a Link between GDP Growth and Equity Returns? *MSCI Barra Research Paper*, No. 2010-18.
- Mutuku, C., & Ng'eny, K. L. (2015). Macroeconomic variables and the Kenya equity market: A time series analysis. *Business and Economic Research*, 5(1), 1-10.
- Mohd, M. A., Thaker, T., Rohilina, W., Hassama, A., & Amin, M. F. (2009). Effects of macroeconomic variables on stock prices in Malaysia: An approach of error correction model.
- Nikmanesh, L., & Nor, A. H. S. M. (2016). Macroeconomic Determinants of Stock Market Volatility: An Empirical Study of Malaysia and Indonesia. *Asian Academy of Management Journal*, 21(1), 161.
- Nijam, H. M., Ismail, S. M. M., & Musthafa, A. M. M. (2015). The impact of macroeconomic Variables on stock market performance: Evidence from Sri Lanka. *Journal of Emerging Trends in Economics and Management Sciences*, 6(2), 151-157.
- Najafzadeh, B., Monjazed, M., & Mamipour, S. (2016). The analysis of real exchange rate volatility and stock exchange return with PANEL-GARCH Approach (Case study: D8 countries). *Iranian Economic Review*, 20(4), 525-550.
- Nordin, S., & Ismail, R. (2014). The impact of palm oil price on the Malaysian stock market performance. *Journal of Economics and Behavioral Studies*, 6(1), 1-9.

- Ouma, W.N., Muriu, P. (2014). The impact of macroeconomic variables on stock market returns in Kenya. *International Journal of Business and Commerce*, 3(11), 1-31.
- Phelps, E. S. (1973). Inflation in the theory of public finance. *The Swedish Journal of Economics*, 67-82.
- Pramod, N. K., & Puja, P. (2012). *The impact of macroeconomic fundamentals on stock prices revisited: An evidence from Indian Data* (Working Paper No. 38980). Retrieved from Munich Personal RePEc Archive website: [http://mpa.ub.uni-muenchen.de/38980/2/The\\_impact\\_of\\_Macroeconomic\\_Fundamentals\\_on\\_Stock\\_Prices\\_revisited\\_An\\_evidence\\_from\\_Indian\\_Data.pdf](http://mpa.ub.uni-muenchen.de/38980/2/The_impact_of_Macroeconomic_Fundamentals_on_Stock_Prices_revisited_An_evidence_from_Indian_Data.pdf)
- Paul, R. K. (2014). Multicollinearity: Causes, effects and remedies. *Journal of IASRI*, New Delhi, 1-14.
- Payne, N. (2014). Evaluating the impact of heteroscedasticity on the predictive ability of modern regression techniques (Master's thesis). Simon Fraser University, British Columbia, Canada.
- P.A. Geroski & S. Toker (1994), The turnover-of market leaders in UK manufacturing industry, 1979-86. London Business School, Sussex Place, Regent's Park, London NW1 4SA, UK. Accepted 15 December 1994
- Rahman, A. A., Sidek, N. Z. M., & Tafri, F. H. (2009). Macroeconomic determinants of Malaysian stock market. *African Journal of Business Management*, 3(3), 095-106.
- Ritter, J. R. (2005). Economic growth and equity return. *Pacific-Basin Finance Journal*, 13, 489-503.

- Reinganum, M. R. (1999). The significance of market capitalization in portfolio management over time. *The Journal of Portfolio Management*, 25(4), 39-50.
- Sensoy, A., & Sobaci, C. (2014). Effective transfer entropy approach to information flow between exchange rate and stock markets (Working Paper No. 14). Retrieved from Research Department of Borsa Istanbul website: <http://www.borsaistanbul.com/docs/default-source/research/14-effective-transfer-entropy-approach-to-information-flow-between-exchange-rates-and-stock-markets.pdf?sfvrsn=4>
- Sekaran, U., Robert, Y. C., & Brain, L. D. (2001). *Applied business research*.
- Singh, T., Mehta, S., & Varsha, M. S. (2011). Macroeconomic factors and stock returns: Evidence from Taiwan. *Journal of Economics and International Finance*, 2(4), 217-227.
- Tan, H. W., Lee, K. C., Tan, Y. L., Wan, S. L., & Wong, P. M. (2016). *Impact of Macroeconomic Factors on the Performance of Stock Market in Malaysia* (Doctoral dissertation, UTAR).
- Tang, H.P., Habibullah, M.S., & Puah, C.H. (2007). Stock market and economic growth in selected Asian countries.
- Tangjitprom, N. (2012). Macroeconomic factors of emerging stock market: The evidence from Thailand. *International Journal of Financial Research*, 3(2), 105-114
- Tian, G. G., & Ma, S. (2010). The relationship between stock returns and the foreign exchange rate: The ARDL approach. *Journal of the Asia Pacific Economy*, 15(4), 490-508.

- Teo, K. H., Ng, S. W., So, B. E., Tan, W. K., & Yu, K. C. (2015). The determinants of Malaysian stock market performance (Doctoral dissertation, UTAR).
- Tetlock, P. C. (2007). Giving content to investor sentiment: The role of media in the stock market. *The Journal of Finance*, 62(3), 1139-1168.
- Theriou, N. G., Aggelidis, V. P., & Maditinos, D. I. (2010). Testing the relation between beta and returns in the Athens stock exchange. *Managerial Finance*, 36(12), 1043-1056.
- Uma Murthy, Paul Anthony & Rubana Vighnesvaran, (2017). Factors Affecting Kuala Lumpur Composite Index (KLCI) Stock Market Return in Malaysia. *International Journal of Business and Management*; Vol. 12, No. 1; 2017
- Vatcheva, K. P., Lee, M. J., McCormick, J. B., & Rahbar, M. H. (2016). Multicollinearity in regression analyses conducted in epidemiologic studies. *Epidemiology*, 6(2), 1-9.
- Wooldridge, J. M. (2005). *Introductory econometrics: A modern approach (3rd ed.)*. Mason, OH: South-Western College Publishing.
- Wong, B. (2014). *Introduction to (generalized) autoregressive conditional heteroskedasticity models in time series (Honors thesis)*. University of Washington, Washington, United States.
- Yalçın, K. C. (2010). Market rationality: Efficient market hypothesis versus market anomalies. *European Journal of Economic and Political Studies*, 3(2), 23-38.
- Yartey, C. A., and Adjasi, C. K. (2007). *Stock Market Development in Sub-Saharan Africa: Critical Issues and Challenges. IMF Working Paper No. 07/209*. IMF.

Yu H., Jiang, S., & Land, K .C. (2015). Multicollinearity in hierarchical linear models. *Social Science Research*, 53, 118-136.

Zakaria, S., Saleh, M. S. M., Wahid, K. A., & Bakar, H. A. (2019). The Macroeconomic Determinants of Malaysian Stock Market Return. *AU ICBE 2019*, 241.

Zouaoui, M., Nourigat, G., & Beer, F. (2010). How does investor sentiment affect stock market crises? Evidence from panel data (Cahier de recherche n 2010-08 E2). Retrieved from HAL archives-ouvertes website: <https://halshs.archives-ouvertes.fr/halshs-00534754>



## APPENDIX 1

### R-Squared Result

Dependent Variable: LKLCI Method: Least Squares Date: 07/09/21 Time: 23:11 Sample (adjusted): 2001 2019 Included observations: 18 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCPI	0.010062	0.020207	0.497948	0.6283
LEXCHANGERATE	-0.349223	0.086780	-4.024250	0.0020
LGDP	-0.016758	0.017639	-0.950102	0.3625
LI	-0.115126	0.170022	-0.677124	0.5123
LMCAP	0.816392	0.031016	26.32203	0.0000
LT	-0.063998	0.044099	-1.451231	0.1746
C	-1.677641	0.742245	-2.260223	0.0451
R-squared	0.993303	Mean dependent var	7.143891	
Adjusted R-squared	0.989650	S.D. dependent var	0.363809	
S.E. of regression	0.037012	Akaike info criterion	-3.469826	
Sum squared resid	0.015069	Schwarz criterion	-3.123570	
Log likelihood	38.22843	Hannan-Quinn criter.	-3.422082	
F-statistic	271.9142	Durbin-Watson stat	1.906224	
Prob(F-statistic)	0.000000			

## APPENDIX 2

### Descriptive Test Result

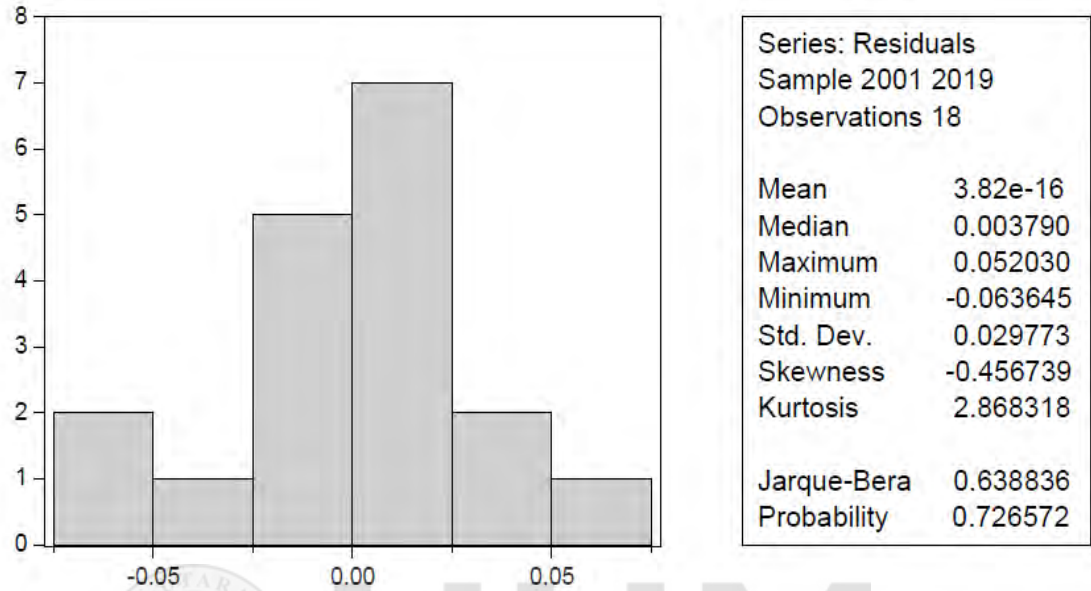
Date: 07/09/21 Time: 23:50 Sample: 1990 2020							
	LKLCI	LCPI	LEXCHANG	LGDP	LI	LMCAP	LT
Mean	7.143891	0.706317	1.299439	1.558938	1.098815	13.42350	24.03194
Median	7.329624	0.712758	1.332231	1.677053	1.098612	13.58733	24.15932
Maximum	7.532067	1.691939	1.501006	2.001480	1.252763	13.90544	24.74424
Minimum	6.471295	-0.400478	1.117925	-0.693147	0.989541	12.55729	23.17214
Std. Dev.	0.363809	0.526035	0.114238	0.579467	0.080957	0.476410	0.446881
Skewness	-0.623524	-0.164428	-0.036351	-3.493362	0.380606	-0.643128	-0.499836
Kurtosis	1.796943	2.650481	1.992983	14.24802	2.392490	1.921590	2.598343
Jarque-Bera	2.251855	0.172732	0.764527	131.4991	0.711385	2.113066	0.870504
Probability	0.324351	0.917259	0.682315	0.000000	0.700688	0.347659	0.647102
Sum	128.5900	12.71370	23.38991	28.06089	19.77867	241.6229	432.5750
Sum Sq. Dev.	2.250071	4.704115	0.221855	5.708294	0.111419	3.858426	3.394941
Observations	18	18	18	18	18	18	18





### APPENDIX 3

#### Normality Test



**UUM**  
Universiti Utara Malaysia

## APPENDIX 4

### Covariance Correlation Analysis Result

	LKLCI	LCPI	LEXCHANG	LGDP	LI	LMCAP	LT
LKLCI	1.000000	0.006040	-0.071480	0.357625	0.366122	0.990533	0.695140
LCPI	0.006040	1.000000	-0.271607	0.188715	0.399544	0.003736	0.343637
LEXCHANG	-0.071480	-0.271607	1.000000	-0.188230	-0.123897	0.013700	-0.245314
LGDP	0.357625	0.188715	-0.188230	1.000000	0.192067	0.373346	0.423364
LI	0.366122	0.399544	-0.123897	0.192067	1.000000	0.405711	0.715751
LMCAP	0.990533	0.003736	0.013700	0.373346	0.405711	1.000000	0.721645
LT	0.695140	0.343637	-0.245314	0.423364	0.715751	0.721645	1.000000

Covariance Analysis: Ordinary  
 Date: 07/09/21 Time: 23:51  
 Sample: 2001 2019  
 Included observations: 18  
 Balanced sample (listwise missing value deletion)

Covariance Correlation t-Statistic Probability	LKLCI	LCPI	LEXCHANG	LGDP	LI	LMCAP	LT
LKLCI	0.125004 1.000000 ---- ----						
LCPI	0.001092 0.006040 0.024162 0.9810	0.261340 1.000000 ---- ----					
LEXCHANGERATE	-0.002806 -0.071480 -0.286655 0.7781	-0.015415 -0.271607 -1.128866 0.2756	0.012325 1.000000 ---- ----				
LGDP	0.071204 0.357625 1.531807 0.1451	0.054328 0.188715 0.768673 0.4533	-0.011768 -0.188230 -0.766622 0.4545	0.317127 1.000000 ---- ----			
LI	0.010184 0.366122 1.573757 0.1351	0.016070 0.399544 1.743372 0.1004	-0.001082 -0.123897 -0.499437 0.6243	0.008510 0.192067 0.782841 0.4452	0.006190 1.000000 ---- ----		
LMCAP	0.162143 0.990533 28.86211 0.0000	0.000884 0.003736 0.014945 0.9883	0.000704 0.013700 0.054804 0.9570	0.097341 0.373346 1.869784 0.1270	0.014778 0.405711 1.775540 0.0948	0.214357 1.000000 ---- ----	
LT	0.106737 0.695140 3.867939 0.0014	0.076293 0.343637 1.463685 0.1626	-0.011828 -0.245314 -1.012184 0.3265	0.103541 0.423364 1.869239 0.0800	0.024456 0.715751 4.099639 0.0008	0.145102 0.721645 4.169771 0.0007	0.188608 1.000000 ---- ----

## APPENDIX 5

### Multicollinearity: VIF Results

Variance Inflation Factors			
Date: 07/12/21 Time: 22:48			
Sample: 1990 2020			
Included observations: 31			
Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	119531.7	100.2678	NA
CPI	653.3963	3.602206	1.285046
EXCHANGE_RATE	9958.343	103.0615	2.627336
GDP_GROWTH	115.4018	4.368336	1.552287
INTEREST_RATE	815.2241	6.368470	2.137367
MARKET_CAP	1.71E-08	6.006539	2.611644
TURNOVER	1.35E-17	9.330318	2.494323



**UUM**  
Universiti Utara Malaysia

## APPENDIX 6

### Heteroskedasticity Test – ARCH Result

Heteroskedasticity Test: ARCH				
F-statistic	1.198973	Prob. F(1,14)	0.2920	
Obs*R-squared	1.262162	Prob. Chi-Square(1)	0.2612	
Test Equation: Dependent Variable: RESID^2 Method: Least Squares Date: 07/17/21 Time: 02:53 Sample (adjusted): 2002 2019 Included observations: 16 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000674	0.000380	1.776172	0.0974
RESID^2(-1)	0.487584	0.445292	1.094976	0.2920
R-squared	0.078885	Mean dependent var	0.000923	
Adjusted R-squared	0.013091	S.D. dependent var	0.001225	
S.E. of regression	0.001217	Akaike info criterion	-10.46873	
Sum squared resid	2.07E-05	Schwarz criterion	-10.37215	
Log likelihood	85.74980	Hannan-Quinn criter.	-10.46378	
F-statistic	1.198973	Durbin-Watson stat	1.525634	
Prob(F-statistic)	0.292008			

## APPENDIX 7

Autocorrelation: Breusch Pagan Godfrey

Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F-statistic	1.782033	Prob. F(6,11)	0.1923	
Obs*R-squared	8.872294	Prob. Chi-Square(6)	0.1809	
Scaled explained SS	3.095259	Prob. Chi-Square(6)	0.7968	
Test Equation: Dependent Variable: RESID^2 Method: Least Squares Date: 07/09/21 Time: 23:43 Sample: 2001 2019 Included observations: 18				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.047519	0.020904	-2.273214	0.0441
LCPI	-0.001160	0.000569	-2.038015	0.0663
LEXCHANGERATE	0.003108	0.002444	1.271570	0.2298
LGDP	8.97E-05	0.000497	0.180669	0.8599
LI	0.000410	0.004788	0.085568	0.9333
LMCAP	-0.001935	0.000873	-2.214768	0.0488
LT	0.002934	0.001242	2.362605	0.0376
R-squared	0.492905	Mean dependent var	0.000837	
Adjusted R-squared	0.216308	S.D. dependent var	0.001177	
S.E. of regression	0.001042	Akaike info criterion	-10.60932	
Sum squared resid	1.20E-05	Schwarz criterion	-10.26307	
Log likelihood	102.4839	Hannan-Quinn criter.	-10.56158	
F-statistic	1.782033	Durbin-Watson stat	2.450958	
Prob(F-statistic)	0.192305			