# ANALYZING THE DYNAMIC RELATIONSHIP BETWEEN SELECTED MACROECONOMIC VARIABLES ON THE BILATERAL EXCHANGERATE OF MALAYSIA WITH ITS NEIGHBOURING COUNTRIES



DEBBIE LIZA ANAK PENCIL

SULTAN IDRIS EDUCATION UNIVERSITY

2024

# ANALYZING THE DYNAMIC RELATIONSHIP BETWEEN SELECTED MACROECONOMIC VARIABLES ON THE BILATERAL EXCHANGE RATEOF MALAYSIA WITH ITS NEIGHBOURING COUNTRIES

DEBBIE LIZA ANAK PENCIL

05-4506832 pustaka.upsi.edu.my Perpustakaan Tuanku Bainun Kampus Sultan Abdul Jalil Shah PustakaTBainun ptbupsi

DISSERTATION PRESENTED TO QUALIFY FOR A MASTER OF ECONOMICS (RESEARCH MODE)

FACULTY OF MANAGEMENT AND ECONOMICS
SULTAN IDRIS EDUCATION UNIVERSITY

2024

05-4506832 pustaka.upsi.edu.my Perpustakaan Tuanku Bainun Kampus Sultan Abdul Jalil Shah PustakaTBainun ptbupsi

UPSI/IPS-3/BO 32
Pind : 00 m/s: 1/1

UNIVERSITI PENDIDIKAN SULTAN IDRIS
SULTAN IDRIS EDUCATION UNIVERSITY

Please tick (√)
Project Paper
Masters by Research
Master by Mixed Mode
PhD

[ ]
[√]
[ ]
[ ]

**INSTITUTE OF GRADUATE STUDIES**

**DECLARATION OF ORIGINAL WORK**

This declaration is made on the ....4.....day of....11.....20..24.....

**i. Student's Declaration**:

I, DEBBIE LIZA ANAK PENCIL, M20201000906, FACULTY OF MANAGEMENT AND ECONOMICS (PLEASE INDICATE STUDENT'S NAME, MATRIC NO. AND FACULTY) hereby declare that the work entitled ANALYZING THE DYNAMIC RELATIONSHIP BETWEEN SELECTED MACROECONOMIC VARIABLES ON THE BILATERAL EXCHANGE RATE OF MALAYSIA WITH ITS NEIGHBOURING COUNTRIES is my original work. I have not copied from any other students' work or from any other sources except where due reference or acknowledgement is made explicitly in the text, nor has any part been written for me by another person.



Signature of the student

**ii. Supervisor's Declaration:**

I PM DR NORIMAH BINTI RAMBELI @ RAMLI (SUPERVISOR'S NAME) hereby certifies that the work entitled ANALYZING THE DYNAMIC RELATIONSHIP BETWEEN SELECTED MACROECONOMIC VARIABLES ON THE BILATERAL EXCHANGE RATE OF MALAYSIA WITH ITS NEIGHBOURING COUNTRIES (TITLE) was prepared by the above named student, and was submitted to the Institute of Graduate Studies as a * partial/full fulfillment for the conferment of MASTER OF ECONOMICS (PLEASE INDICATE THE DEGREE), and the aforementioned work, to the best of my knowledge, is the said student's work.

04/11/2024
Date

Signature of the Supervisor

UPSI/IPS-3/BO 31
Pind.: 01 m/s:1/1

UNIVERSITI PENDIDIKAN SULTAN IDRIS
SULTAN IDRIS EDUCATION UNIVERSITY

**INSTITUT PENGAJIAN SISWAZAH /**
***INSTITUTE OF GRADUATE STUDIES***

**BORANG PENGESAHAN PENYERAHAN TESIS/DISERTASI/LAPORAN KERTAS PROJEK**
***DECLARATION OF THESIS/DISSERTATION/PROJECT PAPER FORM***

Tajuk / *Title*: ANALYZING THE DYNAMIC RELATIONSHIP BETWEEN SELECTED MACROECONOMIC VARIABLES ON THE BILATERAL EXCHANGE RATE OF MALAYSIA WITH ITS NEIGHBOURING COUNTRIES

No. Matrik /*Matric's No.*: M20201000906

Saya / *I* : DEBBIE LIZA ANAK PENCIL

(Nama pelajar / *Student's Name*)

mengaku membenarkan Tesis/Disertasi/Laporan Kertas Projek (Kedoktoran/Sarjana)* ini disimpan di Universiti Pendidikan Sultan Idris (Perpustakaan Tuanku Bainun) dengan syarat-syarat kegunaan seperti berikut:-
*acknowledged that Universiti Pendidikan Sultan Idris (Tuanku Bainun Library) reserves the right as follows:-*

1. Tesis/Disertasi/Laporan Kertas Projek ini adalah hak milik UPSI.
   *The thesis is the property of Universiti Pendidikan Sultan Idris*
2. Perpustakaan Tuanku Bainun dibenarkan membuat salinan untuk tujuan rujukan dan penyelidikan.
   *Tuanku Bainun Library has the right to make copies for the purpose of reference and research.*
3. Perpustakaan dibenarkan membuat salinan Tesis/Disertasi ini sebagai bahan pertukaran antara Institusi Pengajian Tinggi.
   *The Library has the right to make copies of the thesis for academic exchange.*
4. Sila tandakan ( √ ) bagi pilihan kategori di bawah */ Please tick ( √ ) for category below:-*

| | | |
|---|---|---|
| ☐ | **SULIT/*CONFIDENTIAL*** | Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia seperti yang termaktub dalam Akta Rahsia Rasmi 1972. / *Contains confidential information under the Official Secret Act 1972* |
| ☐ | **TERHAD/*RESTRICTED*** | Mengandungi maklumat terhad yang telah ditentukan oleh organisasi/badan di mana penyelidikan ini dijalankan. / *Contains restircted information as specified by the organization where research was done.* |
| ☑ | **TIDAK TERHAD / *OPEN ACCESS*** | |

(Tandatangan Pelajar/ Signature)

Prof. Madya Dr. Norimah Bt Rambeli@Kamdi
Jabatan Ekonomi
Fakulti Pengurusan dan Ekonomi
Universiti Pendidikan Sultan Idris

(Tandatangan Penyelia / *Signature of Supervisor*)
& (Nama & Cop Rasmi / *Name & Official Stamp*)

Tarikh: 04/11/2024

Catatan: Jika Tesis/Disertasi ini **SULIT** @ **TERHAD**, sila lampirkan surat daripada pihak berkuasa/organisasi berkenaan dengan menyatakan sekali sebab dan tempoh laporan ini perlu dikelaskan sebagai **SULIT** dan **TERHAD**.

*Notes: If the thesis is CONFIDENTAL or RESTRICTED, please attach with the letter from the organization with period and reasons for confidentiality or restriction.*

## ACKNOWLEDGEMENT

First of all, I would like to thank God because of His grace, then I was able to complete this research thesis successfully despite many trials and challenges. Thank you, God. I am grateful and would like to express my sincere gratitude to my supervisor Associate Professor Dr Norimah binti Ramli @ Rambeli for her invaluable guidance, continuous encouragement and constant support in making this research possible. I really appreciate her guidance from the initial to the final level that enabled me to develop an understanding of this research thoroughly. Without her advice and assistance, it would be a lot tougher to complete this thesis. I also sincerely thank her for the time spent proofreading and correcting my mistakes despite her busy schedules. Her endless encouragements make me want to further my studies to another next level in the future. To cut it short, she is my role model when it comes to academics. I acknowledge my sincere indebtedness and gratitude to my parents, my siblings and my family members for their love, dream and sacrifice throughout my life. I am thankful for their sacrifice, patience understanding and support especially regarding financially that were inevitable to make this work possible. Their sacrifice had inspired me from the day I learned how to read and write until what I have become now. I cannot find the appropriate words that could properly describe my appreciation for their devotion, support, and faith in my ability to achieve my dreams. My sincere thanks to my beloved Master's degree friends, Gevivian anak Giri and Ainur Attira binti Azmi which contributed to my thesis directly or indirectly. I would like to acknowledge their comments and suggestions, which were crucial for the successful completion of this study. Especially to Gevivian, without her companion back and forth going to campus, it would be a lot tougher to complete my thesis. I wouldlike to thank any person which contributes to my thesis directly or indirectly, especiallyto Fatin Nabilah binti Mazlan, Nur Azeeha binti Ab. Rahim and to Aliah Shahdahbinti Azahar for their help, endless support and encouragement whilst completing my thesis. And to my all good friends I had in Taman Bahtera, no words can describe how much I feel grateful and thanked them for their good companions for me while being in Tanjong Malim. Without companions from them, it would be a bit difficult for me to handle my homesick. For their kind treatment as a family to me other than always willing to offer helps whenever I face with difficulties, I would be forever feeling indebted to them. Lastly, thank you to the Institute of Graduate Studies, particularly, and the Sultan Idris University of Education for giving me chances o further my studies to this level. Thanks also to the Faculty of Management and Economics for giving full support in the course of my studies so that this study can be completed successfully. I hope this research thesis can be useful knowledge to future generations.

## ABSTRACT

The aim of this study was to analyse the dynamic relationship between selected macroeconomic variables on the bilateral exchange rate of Malaysia with its neighbouring countries. The macroeconomic variables used are export, import, inflation, interest rate and gross domestic product. The time series data used in this study is starting January 2014 until December 2021. Method of analysis used in this study Autoregressive Distributed Lag (ARDL) to determine the effects and relationships of bilateral exchange rate and macroeconomic variables. In this study there are two bilateral exchange rates consisting of Malaysia-Singapore exchange rate (MSER) and Malaysia-Thailand exchange rate (MTER). This study compares three models that differ in time span, namely the full model (2014-2021), regime 1 before health crisis; (2014-2018), and regime 2 during health crisis; (2019-2021). The results show that in the full model MSER, inflation significantly impact exchange rate, except for the export, import, interest rate and gross domestic product. Moreover, the results in regime 1 and regime 2 MSER show that interest rate and gross domestic product significantly impact exchange rate. For MTER full model, inflation is presented as dominant variable impacting significantly exchange rate. Besides, in regime 1 and regime 2 MTER, reveal that import and gross domestic product become the dominant variable which has significant impact on exchange rate respectively. Overall, there are exist the impact between selected macroeconomic variables on exchange rate in Malaysia's neighbourhood countries. The results of the study are beneficial to government, economists and prospective investors, as these can help in making policy decisions to control the bilateral exchange rate Malaysia with its neighbourhood countries from depreciate rapidly.

.

# MENGANALISIS HUBUNGAN DINAMIK ANTARA PEMBOLEH UBAH MAKROEKONOMI TERPILIH TERHADAP KADAR PERTUKARAN DUA HALA ANARA MALAYSIA DENGAN NEGARA-NEGARA JIRAN

## ABSTRAK

Tujuan kajian ini dijalankan adalah untuk menganalisis hubungan dinamik antara pembolehubah makroekonomi terpilih dengan kadar pertukaran dua hala antara Malaysia dengan negara jiran. Pembolehubah makroekonomi yang terpilih adalah eksport, import, inflasi, kadar faedah dan keluaran dalam negara kasar. Data siri masa yang digunakan dalam kajian ini adalah bermula dari Januari 2014 sehingga Disember 2021. Kaedah analisis yang digunakan dalam kajian ini ialah Model Autoregresif Lat Tertabur (ARDL) untuk menentukan kesan dan hubungan antara kadar pertukaran dua hala dengan pembolehubah makroekonomi. Dalam kajian ini terdapat dua kadar pertukaran dua hala yang terdiri termasuklah kadar pertukaran dua hala antara Malaysia-Singapura (MSER) dan kadar pertukaran dua hala antara Malaysia-Thailand (MTER). Kajian ini turut membandingkan tiga model yang berbeza dalam jangka masa, iaitu model penuh (2014-2021), rejim 1 sebelum krisis kesihatan; (2014-2018), dan rejim 2 semasa krisis kesihatan; (2019-2021). Keputusan menunjukkan bahawa dalam model penuh MSER, inflasi memberi kesan ketara kepada kadar pertukaran, kecuali eksport, import, kadar faedah dan keluaran dalam negara kasar. Selain itu, keputusan dalam rejim 1 dan rejim 2 MSER menunjukkan bahawa kadar faedah dan keluaran dalam negara kasar memberi impak yang ketara kepada kadar pertukaran. Bagi model penuh MTER, inflasi ditunjukkan sebagai pembolehubah dominan yang memberi kesan ketara kepada kadar pertukaran. Selain itu, dalam rejim 1 dan rejim 2 MTER, mendedahkan bahawa import dan keluaran dalam negara kasar menjadi pembolehubah dominan yang masing-masing mempunyai kesan yang signifikan terhadap kadar pertukaran. Secara keseluruhannya, wujud kesan antara pembolehubah makroekonomi terpilih terhadap kadar pertukaran di negara kejiranan Malaysia. Hasil kajian itu bermanfaat kepada kerajaan, ahli ekonomi dan bakal pelabur, kerana ini boleh membantu dalam membuat keputusan dasar untuk mengawal kadar pertukaran dua hala Malaysia dengan negara kejiranan daripada susut nilai dengan cepat.

# CONTENTS

**CHAPTER 5 CONCLUSION, POLICY IMPLICATIONS ANDRECOMMENDATIONS**

# LIST OF TABLES

# LIST OF CHARTS

# LIST OF DIAGRAMS

## LIST OF ABBREVIATIONS

| | |
|---|---|
| ADF | Augmented Dickey-Fuller test |
| ARDL | Autoregressive Distributive Lag |
| BIBF | Bangkok International Banking Policies |
| CUSUM | Cumulative Sum |
| ECM | Error Correction Model |
| ECT | Error Correction Term |
| GDP | Gross Domestic Product |
| IMF | International Monetary Fund |
| MAS | Monetary Authority Singapore |
| MIDA | Malaysia's Industrial Development Authority |
| MTER | Malaysia-Thailand exchange rate |
| RM | Ringgit Malaysia |
| SGD | Singapore Dollar |
| THB | Thai Baht |
| USD | US Dollar |

# CHAPTER 1

# INTRODUCTION



## 1.1 Introduction

Exchange rate plays an important role in international currency markets. The volatility of the exchange rate, in whatever direction it moves, has a great impact on the economy. Exchange rate fluctuations are often become the main concern of many parties such as governments, economists, exporters and importers. (Tawadros 2017; Khan *et al*. 2019; Xie and Chen 2019).

Therefore, in summary, Chapter One introduced the study. This section consists of the background of the study, problem statement, research objectives, research questions, hypotheses of the study, conceptual framework, definition of variables, research scope and limitation of the study, significance of study and lastly chapter summary. Research objectives are divided into two categories such as general objective

and specific objectives in order to help readers have better understanding and clearer view of the research. Whereas for definition of variables, consist of dependent variable (exchange rate) and independent variables (export, import, inflation, interest rate and gross domestic product).

## 1.2 Background of Study

Exchange rate is the numbers of unit of domestic currency. It is used to buy another unit of foreign country's currency (Wan Mohd Yaseer, 2016). Exchange rate is one of the main financial variables. Exchange rate can affect economic growth of a country, either negatively or positively (ambiguous) (Rambeli, 2014).



Moffett et al. (2017) classified exchange rates into four types. First, a fixed rate of exchange. This fixed exchange rate is under control of government, which makes use of the country's resources for a set period of time. Second, managed floating exchange rate. It is determined by the engagement of the government with both the demand and supply of specific currencies. Third, freely floating exchange rate. This type of exchange rate is which in an open market, its demand and supply are completely determined by market forces, without any involvement from the government. Lastly, pegged exchange rate that happens when domestic currency is related to currencies from other countries (Moffett et al., 2016).

After the Bretton Woods system failed in 1973, a system of fixed exchange rates discontinued, and the nations were allowed to let their currencies fluctuate over

time. The unstable nature of the exchange rate has grown to be a constant reality for nations that use a floating exchange rate system. According to Oaikhenan and Aigheyisi (2015) and Giannellis and Papadopoulos (2011), substantial variations over the exchange rate's equilibrium values or temporary shifts around its long-term patterns are indicative of the instability of the exchange rate.

The appreciation or depreciation of foreign currency has an impact on how profitable foreign exchange transactions are (Martins, 2015). Exchange rate volatility is linked to erratic changes in relative pricing throughout the country's economy. As a result, one of the key variables determining foreign (direct and portfolio) investments, cost stability, and steady economic growth is exchange rate stability (Ajao, 2015).

By resulting in unanticipated adjustments to the exchange rate levelled adjustments in the key economic determinants increase the volatility of exchange rates. Additionally, shifting these variables may cause fluctuations to increase even more by surpassing the short-term aim for the long-term equilibrium exchange rate (Ayhan, 2016).

Uncertainty in an economy is triggered by severe fluctuations in exchange rates, which causes postponement in decisions regarding investments. By impacting output, consumption, trade across borders, and the movement of capital, the uncertainty imposed on by instability also has a detrimental impact on economic growth (Oaikhenan and Aigheyisi, 2015). To maintain equilibrium prices, promote economic development, and define macroeconomic and fiscal policy aims, there is an elevated amount of confusion caused by exchange rate volatility (Ajao, 2015). Finding causes

of real fluctuations in exchange rates owing to potential adverse consequences is crucial for creating the best economic strategies to reduce variations in Malaysia.

Malaya, Singapore, Sarawak, and Sabah were the original members of the Union of Malaysia, which was established in 1963. Singapore was forced to withdraw in 1965 because of its internal political unrest. The two additional territories on the island of Borneo are now referred to as East Malaysia, while Malaya is now known as Peninsular Malaysia. From the end of the eighteenth century until 1963, these areas were governed by the British for varied lengths of time. Malaya attained full independence in 1957, Sarawak and Sabah (formerly known as British North Borneo), as well as Singapore, in 1963. Between the two and six degrees northern of the equatorial are these territories.



Nevertheless, several production industries focused on exports, such as those producing textiles, electrical and electronic items, rubber goods, etc., have taken the lead in development since roughly 1970. In generally, the government's approach has given foreign investment a leading position whilst simultaneously promoting greater indigenous, particularly Bumiputera, capital and enterprise involvement. By 1990, the nation had substantially fulfilled the requirements to be classified as a Newly Industrialised Country (NIC) (30% of exports must be manufacturing items).

In the last century or so, Malaysia is often recognised to be one of the most successful non-western nations who have made its transition to contemporary economic development reasonably smoothly. It has served as a significant provider of primary goods to industrialized nations since the late nineteenth century, including tin, rubber,

palm oil, lumber, oil and liquefied natural gas. Therefore, Malaysia is a country that has trading relationships manufacturing primary goods to with foreign countries, especially among Asian countries. This is a benefit to Malaysia in terms of the value of the currency (Malaysian ringgit) remaining low and stable.

Malaysia's currency in today's exchange rate system is the Ringgit Malaysian (RM or MYR). Malaysian Dollar (M$) was the name of the Malaysian currency on June 12, 1967 (Talib, 2005). However, according to Bank Negara Malaysia (2015), the Malaysian currency's name was legally changed to "ringgit" in August 1975 under the Malaysian Currency (Ringgit) Act 1975. As a result, the Ringgit Malaysian is now the Malaysian currency used in the exchange rate system (RM).

Every country, as we all know, has experienced currency collapse because of its own economic situation or global economic conditions. Such a situation will have a negative impact on the exchange rate system, especially if the value of the currency falls. Currency appreciation and depreciation will affect economic activities such as export and import activities, as well as investment activities, all of which will have a significant impact on national income. Malaysia is one of the countries that has experienced currency depreciation issues.

Starting from September 1998 until June 2005, the ringgit was pegged at RM3.80/1 USD. During the period when the ringgit was pegged, it began to show a positive trend. As a result, the fixed exchange rate system has been replaced by a floating system. In July 2005, the float system was introduced. The use of the float system has a positive effect in that the exchange rate is now more stable, which will

indirectly influence the value of the ringgit to rise. The ringgit appreciated to RM3.41/1USD in 2009, and it continued to rise to RM3.20/1USD in 2010. The ringgit's rise has had a very positive impact on other economic indicators, such as low inflation rates and interest rate increases. The floating exchange rate system is still in use and is governed by the central bank.

The exchange rate regime is an effective tool for controlling the currency in the exchange rate market. According to Bunjaku (2015), the exchange rate regime is critical because it is a key tool for the government in regulating currency. Not only that, but these two approaches are also critical in maintaining the country's financial structure and achieving the country's goal of positive economic growth. When the Malaysian ringgit fell during the Asian financial crisis from 1997 to early 1998, the exchange rate regime was implemented. The pegged regime was used at the time to keep the ringgit from falling further.

Few years back, there are increasing in number of studies that have investigated on how fluctuation in exchange rate affects economic growth of one country. Some have explored the interaction between exchange rate and economic growth (Hausmann, 2005; and Missio et al., 2015), in which both findings explain that exchange rate has positive effect on economic growth if the competitive level in exchange rate is maintained or to be likely depreciated. Another research conducted by Habib (2017) explored the influence of exchange rate volatility towards the growth of economy. The findings revealed how depreciation affected economic growth broadly in developing countries.

According to Zakaria (2013), researchers have extensively explored the effect of exchange rate fluctuations on a country and trade flow. Nevertheless, trade excess has an impact of on currency. Exchange rate can influence trade as well. A country's negative balance of payments can be resolved through export as an income source. The findings revealed a significant relation between the export rate and the volatility of the exchange rate. According to Khermiri and Ali (2012), the export rate will lessen the uncertainty. As a result, higher export rate reduces exchange rate volatility while also lowering inflation. The effect of exports on currency fluctuation would still be a major focus to researchers on a country. Exports and the exchange rate are said to be negatively correlated (Moccero, 2006; Abdoh et al., 2016). The negative correlation signifies that as exports rise, the exchange rate falls. According to the observations of Abdoh et al. (2016), exchange rate volatility and export are the most important variables affecting exchange rate flow in ASEAN.



Inflation generally refers to general rising prices and a decline in the purchasing power of money. The Consumer Price Index (CPI) is commonly used to calculate the rate of inflation. Higher rate of domestic inflation can cause lower in the value of domestic currency. Countries with lower inflation imply that currency values are soaring. The Vector Error Correction Model (VECM) demonstrates that the explanatory variable correlation is consistent with the previous assumption and meets the stability condition. The estimation discloses that the inflation rate and the volatility of the exchange rate have a significant and positive correlation (Adeniji, 2013).

Cruz (2013) examined that interest rate has been unrelated to exchange rate. Not only that, the results prove that these two variables are inversely proportionate to

exchange rate uncertainty. The interest rates, according to Keynes (1923), are the borrowing costs capital for a specified timeframe. Furthermore, Ngumo (2012) mentioned that the lender will pay an extra cost or expenditure, which is the borrowing rate of interest, as the purpose is to consume resources. Wilson and Sheefeni (2014) explained that international economics are primarily concerned with how the exchange rate and interest rate are connected to one another. Market indicators such as fluctuations in interest rates defined the exchange rates predicted by the most common theoretical models of currency exchange.

The gross domestic product (GDP) is defined as the measurement of all final goods and services produced and promised by a country over a specific time period, i.e. a year. GDP considers factors including total spending, business spending, personal consumption, and national exports. A few research have been done that reveal the relationship between foreign exchange and GDP. Ramasamy and Abar (2015) investigated the key economic determinants relationships and their effect on currency fluctuations and then discovered that GDP can affect exchange rates.

Mirchandani (2013) discovered a positive correlation between foreign exchange and GDP. In the short run, exchange and revenue rates have insufficient and indirect correlations, but opposite for the long run. It was supported by My and Sayim (2016), who encountered a positive correlation between economic growth and the foreign exchange rate. In annual time series data from year 1975 until year 2015, Mahmood et al. (2011) demonstrated that the fluctuation of positive currency values influenced Pakistan's GDP. Majeed (2018) and Harberger (2003) discovered no relationship between GDP and foreign exchange (2003). They came to an agreement that a rise in

GDP had no impact on the exchange rate.

GDP and currency depreciation are inversely related (Bristy, 2014). The findings are consistent with the findings of Cuiabano and Divino (2010), who discovered a negative relationship between GDP and exchange rate. Furthermore, the finding stated that an increase in GDP will cause the rate of exchange to depreciate in both the long and short run. This is due to the possibility of financial or usage widening because of GDP growth. While financial or usage expansion will result in a domestic currency surplus. As a result, the exchange rate depreciates.

Neighbourhood countries refer to countries that share a border with a particular country (Cadier, 2020). However, in this research will focus on Malaysia's neighbourhood countries namely Singapore and Thailand. This is because Singapore and Thailand are major trading partners and investors in Malaysia (Yusuf, 2008). This is coherent to the definition of bilateral trade from Ramli (2011) which stated that exchange rates and the respective price levels of the two trading partners are two elements that affect the bilateral trade relationship between two countries.

In 2013, Singapore became Malaysia's top exporting partner, leading to the country's RM100.4 billion overall value of exported goods. With a total export amounting to RM180.67 billion, Singapore also became Malaysia's biggest commercial partner within the Association of Southeast Asian Nations (ASEAN). According to the Ministry of Trade and Industry (MITI) report (2014), Malaysia's trade statistics continued strong in 2013, with a 4.6% increase in overall trade in comparison to the previous year. This saw rise of 2.4% for all exported goods and 7.0% for all imported

goods, respectively

Briefly, as an overview of exchange rate system in Singapore, Singapore's monetary policy has focused on managing the exchange rate since 1981. This framework's main goal was intended to support price stability as a solid foundation for long-term economic growth. The structure combines a number of essential elements of the basket, band, and crawl (BBC) regime. A combination of major trading partners' and rivals' currencies is used for managing the Singapore Dollar (S$). According to how much Singapore relies on a specific nation for trade and commerce, distinct weights or levels of significance are given to the different foreign currencies (Khor, 2007).

The Singapore dollar is subject to a controlled float system run by the Monetary Authority Singapore (MAS). The trade adjusted currency exchange rate is permitted to move throughout the regulation band, and its level and direction are disclosed to the market every two years. The band offers flexibility for controlling the currency rate as well as a method for dealing with short-term volatility in the markets for foreign currencies. The range of the exchange rate policy is examined on a regular basis to make sure its implementation still reflects the core principles of the economic system. Therefore, the policy band has a "crawl" aspect that emphasises how crucial it is to continuously monitor the direction of the exchange rate to prevent discrepancies in the purchasing power of the currencies. In particular, the MAS is assumed to relinquish the authority to regulate local interest rates by making the exchange rate the intermediary aim of financial regulation in Singapore. Regarding the free flow of capital, international interest rates and the expectations of investors regarding potential

Singapore dollars fluctuations both play a significant role in determining Singapore's interest rates (Bordo, 2003).

Malaysia continued to preserve its trade in surplus status after 1998 for 16 years in a row amidst an increase in importing rate. The production sector became the main driver of the consistent growth rate, with electric and electronic items emerging as the top export and import products in 2014, accounting for 41.2% and 34.2% of Malaysia's total exports and total imports, respectively (MITI, 2015). Singapore continued to be Malaysia's top exporting partner in 2015 (MITI, 2015). Malaysia heavily relies on its imports of capital products from its primary trading partners, notably Singapore, to sustain its trade growth in the manufacturing sectors.

According to Sato (2010), Singapore and Malaysia both have highly democratic economies as well as societies. They used to be subject to considerable worldwide movement and related transnational challenges due to their physical placement along a major commerce route. Government initiatives in both nations in recent years have made it obvious that they intend to benefit from the interconnectedness of the world economy by promoting commerce, labour, tourist, and international student flows. Singapore and Malaysia both rely heavily on foreign trade. Malaysia has a trade to gross domestic product (GDP) ratio of 159.1%, while Singapore has a ratio of 309.1%. Malaysia is reducing Singapore's part of the lucrative transit trade, which it previously controlled exclusively.

As their financial models overlapped in the 1980s, Malaysia and Singapore grew more interconnected. Following a recession in the middle of the 1980s, Malaysia

took steps to relax investment restrictions and expand its manufacturing industry in order to create jobs and earn foreign currency (Hutchinson and Bhattacharya, 2019). A rush of investment from Japanese and European industries looking to cut their manufacturing expenses also benefited Southeast Asia. Production connections between Singapore and Malaysian manufacturing hubs including Penang, Kuala Lumpur, and Johor Bahru grew regionally before spreading globally (Rasiah, 2009).

Beginning in the middle of the 1980s, work on bilateral economic issues advanced thanks to collaboration between Singapore's Economic Development Board and Malaysia's Industrial Development Authority (MIDA) to promote tourism and cross-border industry. Additionally, the two nations began talks on a variety of topics, including the supply of water, ferry services, and the selling of land to foreign investors, which created a favourable environment for strengthening commercial ties (Shiraishi, 2009).

As for Thailand exchange rate system, Thailand has impressively averaged eight percent annual expansion over the past 20 years. The mid- and late 1990s saw a slowdown in this expansion, but it has recently picked up (Agbola and Kunanopparat, 2005). Thailand established a pegged currency rate system in which the baht was tied to an assortment of currencies between 1990 and 1994 (Kawai, 2002). With the goal to promote economic expansion as well as stability throughout an environment of economic uncertainty that occurred both internally and externally in the late 1980s and early 1990s, the policy of regulating exchange rates constituted a component of a financial restructuring programmed. Large amounts of foreign short-term financing flowed entering Thailand as a result of advantageous monetary regulations, foreign

exchange liberalisation, and the launch of Bangkok International Banking Facilities (BIBF). Thailand as a result implemented a flexible currency rate policy (Kawai, 2002). For the purpose to avert capital flight, the flexible exchange rate system was supposed to bring about the equilibrium real exchange rate. Notwithstanding the revisions, there is still no agreement on the currency rate system that will allow Thailand to resume steady development.

As at the potential of simplifying and generalising, it is arguable that Malaysia's relationship with its northern neighbour, Thailand, is regarded as the least troublesome when contrasted with bilateral relations with the two other near neighbours, such as Singapore and Indonesia. In contrast to its other close neighbours, Cambodia, Laos, and Myanmar, Thailand also appears to have the fewest problems with Malaysia. Except for one short time in the year 2004, as violence incidents in Thailand's Southern Provinces (Deep South) increased, ties between Malaysia and Thailand were rather calm (Khalid and LOH, 2017). As a result, despite the Southern Provinces' issues, the bilateral relationship was mostly unaffected, or at least effectively preserved.

Chirathivat and Cheewatrakoolpong (2015) explained that in comparison to many of its Asian rivals, like Malaysia and Singapore, Thailand is regarded as having an economy that is more liberal with higher access to investment and commerce. Specifically, during the Asian financial crisis of 1997–1998 exporting has occasionally served as a significant development driver, and foreign currency gains have contributed to Thailand restock its surplus of reserves. Thailand has traditionally had a positive trade balance, with border imports making up around 4% of the country's total trade volume and border exports about 8%. For its trading partner Malaysia, the surplus

position has been substantial. Therefore, in this research, researcher tends to investigate the bilateral exchange rate relationship in Malaysia's neighbourhood countries, namely Singapore and Thailand in which to consider the approach of health crisis that occur in Malaysia.

A crisis is described as an unexpected or unsteady economic conditions that can have a negative impact (Rambeli, 2021). Malaysia's economic growth in 2020 was -5.6 percent. In comparison, economic growth in 2019 was 4.3 percent (Bank Negara Malaysia, 2020). The negative growth was like the global economic crisis that occurred in 2008, and this resulted in Malaysia recording -6.2 percent economic growth. The cause of this serious economic shock was the Covid-19 pandemic, which triggered a worldwide financial reaction on an unprecedented level. This response was crucial in avoiding far worse decline in global economic activity. The response focused on restore measures that would help household income, preserve company cash flow, minimize the number of closed-down and bankrupt companies, preserve jobs, and reduce long-term economic risks.

It is not doubtful that outbreaks are a natural phenomenon, and history is replete with examples of natural disasters along with their terrible effects. Like the COVID-19 pandemic, which can also be referred to as the novel corona virus pandemic, it has been reported to have started in December 2019 in Wuhan, China (Gao et al., 2021; Mirza et al., 2020; Su et al., 2021). On March 11, 2020, the World Health Organisation classified this as a pandemic. According to the World Health Organisation (WHO), this deadly pandemic has affected nearly 220 nations and territories, with 169 million confirmed cases and 3.5 million fatalities as of the beginning of the study. In addition to being a

global health concern, COVID-19 caused a substantial effect on the global economy. The global economy remains frozen because of the shutdowns and quarantines required to stop the spread of COVID-19.

Furthermore, the COVID-19 pandemic's effects have been so widespread that all nations—big or small, wealthy, or impoverished—have suffered as a result. The International Monetary Fund (IMF) predicted that the world output had decreased by 3.5% because of the Corona virus's spread by the year 2020. The COVID-19 outbreak has been remarkable, and (Rizvi et al. 2020; Umar et al., 2021a, 2021) found that its effects on global markets have also been reflected in swings in foreign exchange. As one of the most crucial financial metrics, the exchange rate has also been impacted by the pandemic, and the volatility is evident in the currency rates' unpredictability (Su et al., 2021).



Malaysia, like other countries around the world, has suffered economic hardship as a result of the rapid spread of the coronavirus (COVID-19) (Khanthavit, 2021; Khot and Nadkar, 2020; Goh, Henry and Albert, 2021). The pandemic is having a rapid impact on the Malaysian economy (Hasanat et al., 2020). The economy was and still is dealing with the unexpected recession that hit the majority of economic sectors and put the economy in jeopardy. However, the positive effect of COVID-19 boosted the medical supplies and detergent sectors, as well as the technology and food sectors, because the higher demand for their products during the social isolation policy was unaffected.

At the start of the COVID-19 outbreak in Malaysia and around the world, the

government imposed a lockdown on all factories and industries, as well as social isolation of citizens (Das et al., 2020). The government also injected roughly USD 60 billion to mitigate the impact of the unexpected shock and maintain economic stability. Even though the urgent expansionary policy was carried out effectively, the shutdown had an impact on factories and industries in terms of sustaining work and restricting investors. Furthermore, the impact of the sudden and massive global shock of COVID-19 in the media, particularly given the rising deaths and confirmed cases, has increased the turbulence in global economies, including the Malaysian economy (Ajami, 2020; Kristiana, Pramono, and Brian, 2021).

## 1.3 Problem Statement



The exchange rate has a significant impact on the level of exchange in the region, which is important for the economic growth of market economy countries. The effect of currency fluctuations on export markets, trade, investment, financial markets, inflation, and employment growth for both developing and developed nations has been disclosed by empirical researches (Schnabl 2008; Jamil 2012; Rjoub 2012; Allen 2016; Alagidede and Ibrahim 2017; Dal Bianco and Loan 2017; Latief and Lefen 2018; Vo and Zhang 2019; Hatmanu 2020).

Numerous studies on foreign exchange market have been discovered. According to Majeed et al. (2018), foreign exchange rates can also be used as an indicator to decide competitiveness in one country’s currency. The researcher concluded that the country's currency was more competitive between the two if the

value obtained dropped. For this research, the selected macroeconomic factors that act as independent variables are export rate, inflation rate, interest rate and gross domestic product. Whereas exchange rate for dependent variable.

Therefore, this research is conducted relating to bilateral exchange in Malaysia's neighbourhood countries such as Singapore, and Thailand. This study has chosen to conduct the study involving Malaysia's neighbourhood countries due to lack of research regarding bilateral exchange rate affected by macroeconomic variables involving ASEAN countries. For instance, a study conducted by Herrador, Macovei, and Bizer (2022) focusing on currency of US dollar, the euro, the renminbi, the pound sterling, the Japanese yen and the Russian rouble. While another research from Tafa (2015), focusing bilateral exchange rate between US Dollar/Albanian Lek and Euro/Albanian Lek. However, a study by Ramli (2011) is related to bilateral rates in five ASEAN countries, namely Singapore, Malaysia, Thailand, Philippines, and Indonesia against exports which bilateral exchange rate acts as one of independent variables and exports as dependent. However, this research is contrary from previous research as the dependent variables are bilateral exchange rates focused on solely among Malaysia, Singapore and Thailand affected by macroeconomic variables as independent variables. Due to this, the urge to conduct this research is to explore how extent of the effect bilateral exchange rate relationship which caused by macroeconomic indicators among Malaysia-Singapore and Malaysia-Thailand.

To date, the effect of selected macroeconomic variables on exchange rate in Malaysia's neighbourhood countries has never estimated simultaneously by comparing across regimes. The ability to measure the relationship or the level of significant of

those variables, allows a comparison across the regimes studied. Therefore, such a comparison will determine whether the same thing happens in all regimes or differences, in terms of relationships and parameters.

In addition, lack of studies was conducted to investigate the relationship of the variables across regimes namely Health Crisis (COVID-19) to discover what are the contributions of the variables to the exchange rate during two phases of crisis – before Health Crisis and during Health Crisis. This is in accordance with an exchange rate theory, The Balassa-Samuelson Effect Theory, which explains the condition of a country's economic growth affected by exchange rate, especially with the presence of dummy crisis. The research conducted by Lee, Lee, Ng, and Teoh (2019) only discovered the results on the effect of macroeconomic factors on exchange rate without exploring dummy in their research.



Contrast from research conducted by Rambeli and Povinsky (2014), they included dummy variable in the research but not the covid health issue, but rather the Asian financial crisis issue. This research desires to be able on accessing the effects of crises on exchange rates as well as their magnitude and length by including crises in the studies. In addition, knowing how crises affect economic growth can help policymakers know what policies to implement to lessen the negative effects. Policy makers can learn more about the efficacy of various policy tools, including as monetary interventions and structural reforms, in promoting and restoring exchange rates following a crisis by including the crises in research. Conducting a research study can examine an economy's long-term growth trends by examining the frequency and effects of crises on the exchange rate across time. Instead, this research can pinpoint the

elements that support persistence and growth in the face of occasional crises, enabling decision-makers to concentrate on measures that support stability and a stable exchange rate.

For informing policy decisions, it is essential to have recent data. This research can offer useful insights for policymakers by adding recent data because policymakers depend upon evidence-based analysis to develop effective policies. This is crucial when dealing with problems or crises or in unpredictable economic times. Added period data series are required to acquire current situation in that field of studies. Therefore, this research is conducted by employing macroeconomic variables influencing exchange rate in Malaysia and its neighbourhood countries using monthly data from 2014 until to latest year 2021 which inspired by Ng, and Geetha (2020). This time span is chosen because through this research, attempts to consider the presence of dummy (Health Crisis) that is still ongoing in Malaysia.

## 1.4 Research Objectives

In general, research objectives explain what the researchers hope to achieve once the research project is completed. The objectives are related to the research problem and serve as the study's statement of purpose. In other words, research objectives will serve as general guidelines throughout the research.

### 1.4.1 General Objective

This research is conducted to analyze the dynamic relationship between selected macroeconomic variables on the bilateral exchange rate of Malaysia with its neighbouring countries namely Singapore and Thailand. The selected macroeconomic factors are export, import, inflation, interest rate and gross domestic product.

### 1.4.2 Specific Objectives

In this sub-section, there will be three specific objectives for the study. The specific objectives are as follow;

1. To investigate the cointegration between selected macroeconomic variables on selected Malaysia's neighbourhood countries bilateral exchange rate.

2. To determine the long-run relationship between selected macroeconomic variables on selected Malaysia's neighbourhood countries bilateral exchange rate.

3. To identify the short-run relationship between selected macroeconomic variables on selected Malaysia's neighbourhood countries bilateral exchange rate.

For Objective 1, the method that suitable to achieve the objective is Cointegration Bound Test.

For Objective 2, the method that will be using is Long Run Auto-Regressive Distributed Lag (ARDL) Model.

For Objective 3 will be using Short Run Auto-Regressive Distributed Lag (ARDL) Model. These approaches will be deeply explained in Chapter 3.

## 1.5 Research Questions

1. What is the cointegration between selected macroeconomics variables on exchange rate towards Malaysia's neighbourhood countries.

2. What is the long-run relationship between selected macroeconomic variables on exchange rate in Malaysia's neighbourhood countries?

3. What is the short-run relationship between selected macroeconomic variables on exchange rate in Malaysia's neighbourhood countries?

## 1.6 Hypothesis of the Study

A hypothesis is a testable educated or specific prediction. It explains the expectation of events to occur at a specific time and under certain conditions. A hypothesis is a research hypothesis that defines the relationship between two variables, dependent and independent variables. Dependent variable in this study is exchange rate, while independent variables are export, import, inflation, interest rate and gross domestic product.

The purpose of the study is analysing the dynamic relationship between selected macroeconomic variables such as export, import, inflation, interest rate and gross domestic product on the bilateral exchange rate of Malaysia with its neighbouring countries (Singapore and Thailand). The main hypotheses of this study are as follows:

H1: There is a significant cointegration between selected macroeconomic variables on exchange rate for full model in Malaysia's neighbourhood countries.

H2: There is a significant cointegration between selected macroeconomic variables on exchange rate for regime 1 before health crisis in Malaysia's neighbourhood countries.

H3: There is a significant cointegration between selected macroeconomic variables on exchange rate for regime 2 during health crisis in Malaysia's neighbourhood countries.

H4: There is a significant long-run relationship between selected macroeconomic variables on exchange rate for full model in Malaysia's neighbourhood countries.

H5: There is a significant long-run relationship between selected macroeconomic variables on exchange rate for regime 1 before health crisis in Malaysia's neighbourhood countries.

H6: There is a significant long-run relationship between selected macroeconomic variables on exchange rate for regime 2 during health crisis in Malaysia's neighbourhood countries.



H7: There is a significant short-run relationship between selected macroeconomic variables on exchange rate for full model in Malaysia's neighbourhood countries.

H8: There is a significant short-run relationship between selected macroeconomic variables on exchange rate for regime 1 before health crisis in Malaysia's neighbourhood countries.

H9: There is a significant short-run relationship between selected macroeconomic variables on exchange rate for regime 2 during health crisis in Malaysia's neighbourhood countries.

## 1.7 Conceptual Framework

Diagram 1 shows the conceptual framework for analysing the dynamic relationship between selected macroeconomic variables on selected Malaysia's neighbourhood

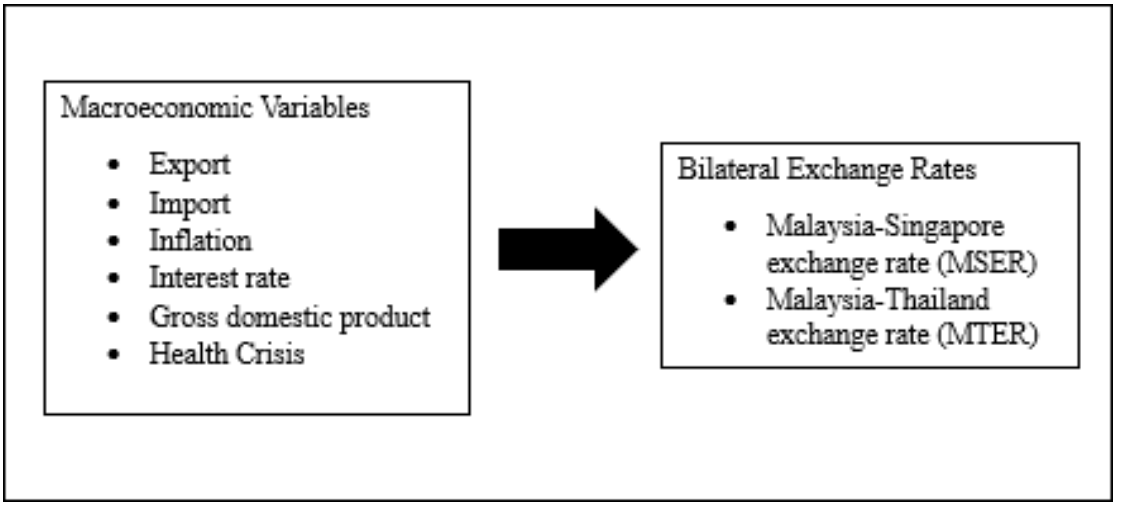
countries bilateral exchange rate across crisis regime. This conceptual framework is inspired by Lee, Lee, Ng, and Teoh (2019) as mentioned before in the problem statement about the whole idea and the urgency of this research.

Many experts employ a variety of hypotheses and models to explain how macroeconomic factors and the exchange rate are related. The theories are centred on three dominant theoretical perspectives, according to Lee, Lee, Ng, and Teoh (2019). The Elasticity Approach takes export and the stability of exchange rates into consideration. Second, the interplay between interest rates, inflation, and currencies was studied using the International Fisher Effect. The most current evidence that changes in interest and inflation rates influence exchange rates to vary was presented by Ortiz and Monge (2015). The Balassa-Samuelson Effect Theory concentrated on the connection between economic growth and exchange rate changes.

Based on the theories developed, this study uses monthly data spanning from 2014M1 to 2021M12 to focus on the impact of macroeconomic variables on bilateral exchange rates. The conceptual framework is created to explain how the variables are connected. The purpose of this relationship is to show how the macroeconomic variables namely export, import, inflation, interest rate and gross domestic product affecting bilateral exchange rates - specifically, Malaysia-Singapore exchange rate and Malaysia-Thailand exchange rate with the presence of dummy health crisis (COVID- 19).

**Diagram 1.**

*Conceptual framework*




## 1.8 Definition of Variables



### 1.8.1 Exchange Rate (ER)

The price of a country's currency in relation to another currency is known as the exchange rate. This demonstrates how different currencies are. An exchange rate, which can be expressed either directly or indirectly, consists of two components: a native currency and a foreign currency. The number of notes that Malaysians keep within their wallets could differ from the same as that of Indonesians. The cost of a unit of foreign currency is stated using the value of the national currency in a direct quotation. The cost of a unit of domestic currency is stated in terms of the foreign currency in an indirect quotation.

Quotes for exchange rates are given in terms of the US dollar. The term "cross

currency" or "cross rate" refers to exchange rates that are quoted against the currency of another country. Exchange rates can be either fixed or fluctuating. A currency rate that is subject to market forces and is typical for most major countries is known as a floating exchange rate. Some countries, however, prefer to establish or peg their national currencies to a commonly use done, such as the US dollar. To lessen volatility or to handle commercial ties more effectively, an exchange rate may be fixed.

### 1.8.2 Export (X)

Despite the nature of the goods or services, exports are defined as products made in one country that consumers subsequently purchase from other nations, the majority of which are outside. When a product is manufactured domestically and sold to a customer outside the country, export may be declared. Exports are one of the elements of international trade in addition to functioning as one of the measures that might affect GDP growth. Export and import operations are apart of international trade. The trade balance of a country can be formed by the sum of exports and imports (international trade).

### 1.8.3 Import (M)

Imports are products and services that enter the economic territory of a nation and increase its stock of raw materials. Goods that are momentarily permitted or just in transit across a country (apart from those intended for inbound processing) are not included in statistics on international merchandise trade because they do not add to the

nation's stock of resources. A nation's economic territory, which is the area within which that nation's customs legislation is fully applicable, frequently overlaps with its customs territory.

### 1.8.4 Inflation (I)

Inflation is the rate at which prices rise over a given timeframe. Inflation is defined as an increase in the prices of goods and services purchased by households. The Consumer Price Index (CPI) is the most well-known indicator of inflation. CPI is used to measure the percentage change in the price of an amount goods and services that households had purchased. The equation for inflation is:



$$\text{Inflation rate} = [(\text{CPI this year} - \text{CPI last year})/\text{CPI last year}] \times 100$$

Prices are facing two main situations over time, either they continue rising or decline which is called as deflation. Inflation is usually defined as a broad measure, such as the total rise in prices or the living cost in a country. However, it can also be calculated more precisely - for specific goods such as food or services. In any case, inflation illustrates how expensively a specific goods and services has become over a certain period, which usually one year.

### 1.8.5 Interest Rate (IR)

In exchange for the money they have borrowed, borrowers must pay lenders interest, which is calculated as a percentage per year (interest rate). Keynes (1960) stated that interest is the compensation for withholding liquidity for a predetermined amount of time. The cost of borrowing is high when interest rates are high. Conversely, low interest rates result in cheap borrowing costs. Additionally, interest rates also apply to people who are saving money. The financial institution will pay interest on savings. Savings will grow when interest rates rise, and vice versa, when interest rates fall, savings are going to decrease. One result is that lending and saving behaviors are impacted by interest rates.

In addition, there are two ways to look at interest rates in the real economy: either as something that is charged at interest rates or something that is paid at interest rates. Interest rate payments or impositions are seen from the perspectives of the creditor and debtor. Creditors or those who lend money seek interest since they have worked hard to save money. Apart from that, if the debtor doesn't make payments, he's willing to stop spending money on the present and the debt. One is unlikely to be enthusiastic about saving if doesn't receive the interest. In other words, the creditor will receive interest payments. Debtors are those who pay interest on money that a creditor has given them.

The provided capital will be put to work in productive production to make money. A portion of the income will be paid to the creditor as borrowed interest.

### 1.8.6 Gross Domestic Product (GDP)

Gross Domestic Product (GDP) is defined as the tools to measure the economic healthiness in a country. It is also represented the total value of all goods and services in country produced in a specific time of period and refer to the size of the country's economy. Moreover, investors will refer to the country's performance by review the economic movement from GDP either the country is suitable to do investment or not. The investor will choose the country that provide the favourable return on investment which is the GDP increasing year by year. GDP can be measure monthly, quarterly and yearly depends on the management of the country. It doesn't matter if the product produced by citizens or foreigners but when they are located within the country's boundaries, their production will be included in GDP of the country.



GDP can be measured by three methods, namely, output method, expenditure method and income method. Firstly, output method measures the monetary and market value of all the goods and services produced within the borders of the country. Secondly, expenditure method measures the total incurred by all entities on goods and services within domestic boundaries of a country. Final method is income method that measures the total income earned by the factors of production includes labour and capital within the domestic boundaries of a country. It is important to make sure GDP is calculated correctly and to avoid double-counting, GDP does not include the parts that go into it but the final value of the product.

### 1.8.7 Dummy Variable

In statistical computing, dummy variables, which also being called as indicator factors, referring to variables that reflect categorical data in a binary (0 or 1) form (Rambeli et. al., 2014). They are used when numerical inputs are needed for a regression model or other statistical analysis that must take into consideration data that is categorical. The health crisis (COVID-19), which is coded with a value of 0 to represent no crisis and a value of 1 to signify the existence of a health crisis, is used in this study to determine its impact on exchange rate.

## 1.9 Limitation of the Study



A study's limitations are any elements or conditions that could prevent or restrict the study's conclusions, findings, or generalizability. Some common limitations of the study include, the method used, the data, the variables employed and the model used in the study. This study focus on the dynamic relationship between selected macroeconomics variables on exchange rate towards Malaysia's neighbourhood countries. This study is conducted to investigate exchange rate within the focused country Malaysia and with its neighbourhood countries – Singapore and Thailand. Each of the variables chosen in this study are exchange rate, export, import, inflation, interest rate and gross domestic product. This study uses monthly data for 8 years starting from year 2014M1 until year 2021M12 sourced from Trading Economics, Central Bank of Malaysia, World Bank and Department of Statistics Malaysia. The research conducted according to the time period chosen (2014-2021) is inspired by Ng, and Geetha (2020)

as the researcher insists to evoke the presence of dummy (Health Crisis). The relationships will be explored using appropriate approaches by using the ARDL approach.

To make a study more focused on the scope that has been set several limitations of the study had been set up as follows:

### 1.9.1 Method Used

The Auto-Regressive Distributed Lag (ARDL) will be used in this study. The variables' short-term and long-term associations can be estimated using this model. The ARDL approach does, however, have limitations just like any other statistical method. The variables must be stationary for the ARDL approach to work. The ARDL approach can result in inaccurate results if the variables are non-stationary or have various orders of integration. Additionally, when the sample size is small, the ARDL approach may result in estimates that are biased or inconsistent. This is particularly true when there are many regressors in comparison to the sample size. The outcomes of the ARDL estimation can be impacted by the lag duration selection. Different lag durations could result in various outcomes. According to Asteriou and Hall (2007), the ARDL is a model based on regression in which a single of the explanation variables is current value or lagged measure of the dependent variable. In the field of economics, Gujarati (2004) explained that the approach known as ARDL is extremely beneficial. With specifically accounting for the significance of time, this approach can transform a static economics theory into a dynamic one.

### 1.9.2 The Data

Only eight years are going to pass before this research considers the macroeconomic variables specified for monthly frequency collection of data, including export, import, inflation, interest rates, gross domestic product, and exchange rates for the span of 2014 through 2021. To further the research by examining the state of the economy at these two regimes—Regime 1 Before Health Crisis and Regime 2 During Health Crisis—it was decided to confine the data to these particular periods of time. This has become a result of the continuing new coronavirus outbreak, also known as Covid-19.

### 1.9.3 Variables Employed



There are several additional variables that are also essential however the variables that were utilised in this research were solely limited to two. Exchange rate acts as a dependent variable, and macroeconomic variables such as export, import, inflation, interest rate, and gross domestic product represent independent variables. The exchange rate is split into two bilateral exchange rates: the first is the rate between Malaysia and Singapore, and the second is the rate between Malaysia and Thailand. The goal of this research was intended to take a closer look at five major variables on both bilateral exchange rates and across regimes, which is the reason why this research just included those five variables.

### 1.9.4 The Model

The Balassa-Samuelson Effect Theory serves as the foundation for this research's formulation of models' limitations. The hypothesis presented out by Bela Balassa and Paul Samuelson in 1964 seems particularly appropriate considering the way the world is evolving currently, which is why this research has concentrated on it. For the purpose of trying to better understand how different theories influence the determinants of the growth of a country, this research will additionally include a closer look at The International Fisher Effect. When examining the most suitable theories created for evaluating the variables utilised depending on the declared relationship, limitations of these models' development need to be taken into consideration several criteria. As a result, the Balassa-Samuelson Effect Theory and the International Fisher Effect shall act as the foundation for the relationship between macroeconomic variables and the exchange rate.

## 1.10 Significance of the Study

In contrast to other studies, which primarily focused on Malaysia, this research will emphasize on Malaysia and its neighbourhood countries, notably Singapore and Thailand. This study will examine how macroeconomic factors interact along with how they affect the exchange rate using data from Malaysia that ranges from 2014M1 to 2021M12. There have yet insufficient investigations comparing such an association across regimes for Malaysia's neighbourhood countries, Singapore and Thailand, despite some studies being done to examine the effects of macroeconomic variables on

bilateral exchange rates in other nations, such as The Southern countries. Studying this relationship shall enable researchers to inquire into the relationship between bilateral exchange rates and macroeconomic variables across regimes as well as their effects on these variables' effects on bilateral exchange rates. The result will cover the gap in understanding within the research that sets it apart from others.

Many researchers centered their study on the correlation between the variables, utilizing the time series methodology, and comparing the two countries, or even reviewing the situation for one country, in accordance with past research. The correlation between the exchange rate and other macroeconomic factors including the money supply, public spending, public debt, foreign direct investment, and so forth is examined in several research. None of the research, nevertheless, reveals the bilateral exchange rates between Malaysia and its neighbouring nations. Autoregressive

Distributed Lag (ARDL) is the testing technique. The data obtained across different regimes are also going to be compared in this research with the aim to highlight any disparities or shared characteristics. According on the inferences, the research is going to recommend the most appropriate approach for Malaysia and the countries neighbouring it to promote the results in the hopes that this can contribute to accelerating the growth of the country's economy.

Additionally, it is hoped that this study may serve as a spark for further research in the future. The reason for this is due to each year's expansion of the economy in globally is different. Therefore, this research aspires to serve as a foundation for further analyses of trends associated to the evolution of macroeconomic variables. This

research can serve as the foundation for further research to determine how Malaysia's neighbouring countries' currency rates and other aspects interact. This study also hopes that future studies will construct upon it by utilizing larger series of times and at least two catastrophes.

In sum, the results of this study hope to be helpful to policymakers, for example the government. This study benefits them to have better and clearer understanding regarding the effect of macroeconomic factors on exchange rate in Malaysia and its neighbourhood countries. In addition, the policymakers will be able to determine for certain if the changes in these selected macroeconomic factors will affect the fluctuations of exchange rate in Malaysia neighbourhood countries. Providing detailed economic analysis on the effect of selected macroeconomic variables such as export, import, inflation, interest rate and gross domestic product towards the exchange rate in Malaysia neighbourhood countries can become references to other future researchers in conducting further analysis and studies regarding this issue.

## 1.11 Chapter Summary

To sum up, this chapter had explained the issues that had become a concern to the world not just to the selected area of study. Collected data was then transfer into a suitable presentation method for further explanation. Each of the selected variables was briefly define in this chapter and the data collection sources.