FACTORS AFFECTING INFLATION IN MALAYSIA

BY

CHEN ZHI NI

A research project submitted in partial fulfillment of the requirement for the degree of

BACHELOR OF ECONOMICS (HONOURS)
GLOBAL ECONOMICS

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF ACCOUNTANCY AND MANAGEMENT
DEPARTMENT OF ECONOMICS

MAY 2024

DECLARATION

We hereby declare that:

(1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the research project.

(4) The word count of this research report is 11109 words.

Name of Student:	Student ID:	Signature:
1. Chen Zhi Ni	2001857	Chen

Date: 3/5/2024

ACKNOWLEDGEMENT

I am grateful from the bottom of my heart to the people who helped me during my research, and I am very grateful for their support and encouragement. At the same time, I would like to express my special thanks to Mr Low Choon Wei for providing me with a lot of help and suggestions during this research. His advice and support were of great significance to my research project and provided me with direction when I was troubled. Additionally, I would like to thank the second reviewer, Dr Ng Kar Yee. Her eye for detail and expertise guided me and enabled me to uncover some important details that needed attention during my project. Finally, I would like to express my gratitude again to my family, friends and classmates for their encouragement and support.

TABLE OF CONTENT

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AD	Aggregate Demand
ADF	Augmented Dickey-Fuller
AS	Aggregate Supply
CPI	Consumer Price Index (2010=100)
DOSM	Department of Statistics Malaysia (DOSM)
ER	Real Effective Exchange Rate (2010=100)
GDP	Gross Domestic Product per capita (constant 2015 US$)
H_0	Null Hypothesis
H_1	Alternative Hypothesis
M	Money supply
MS	Broad Money (Current LCU)
OLS	Ordinary Least Square
P	Price level
PP	Phillips-Perron
UN	Unemployment (%)
V	Velocity of circulation of money
VIF	Variance Inflation Factor
Y	Real national income.

LIST OF APPENDICES

PREFACE

In recent years, inflation has emerged as a significant concern globally, posing challenges for maintaining low and stable inflation rates across many nations. As a student of economics, I have observed the impact of inflation on various economies, including Malaysia. The fluctuations in Malaysia's inflation rate, influenced by both economic and external factors, have sparked my interest in delving deeper into understanding the underlying dynamics.

Motivated by the need to comprehend the factors driving Malaysia's inflation rate, I embarked on this research journey. Spanning a period from 1992 to 2022, my objective was to analyze the intricate relationship between inflation and key economic indicators such as money supply, unemployment rate, gross domestic product, and exchange rate.

The findings of this study revealed intriguing insights. While certain variables, such as money supply and exchange rate, demonstrated a significant relationship with inflation, others like gross domestic product and unemployment rate exhibited negligible impact. This nuanced understanding prompted me to emphasize the critical role of exchange rates in influencing inflation dynamics and advise investors to consider them judiciously in their decision-making process.

As I navigate through the complexities of Malaysia's economic landscape, I recognize the importance of this research in informing policymakers and investors alike. By shedding light on the factors affecting inflation and offering actionable recommendations, I hope that this research can provide valuable insights to guide future economic policy formulation and investment decisions.

ABSTRACT

Inflation has emerged as a significant concern globally, posing challenges for maintaining low and stable inflation rates across many nations. In Malaysia, inflation has been influenced by various economic and external factors in recent years. This research delves into the factors impacting Malaysia's inflation rate from 1992 to 2022, drawing on annual data spanning 30 years. Additionally, it explores the relationships between inflation and key factors such as money supply (MS), unemployment rate (UN), gross domestic product (GDP), and exchange rate (ER).

To investigate the factors affecting in Malaysia's economy, the time series data analysis will be tested by using the OLS regression to determine the significance of independent variables in affecting inflation. The data for this study were collected from the World Bank and the Department of Statistics Malaysia. The OLS regression result shows that the money supply (MS) and exchange rate (ER) have a relationship while the gross domestic product (GDP) and unemployment (UN) have no relationship. Therefore, the CPI model shows that UN and ER have a negative impact on the CPI. However, MS and GDP have a positive impact on the CPI.

Since exchange rates have the most significant impact on the CPI in this study, investors are advised to refer to exchange rates before making decisions. The exchange rate has a significant negative relationship with inflation in Malaysia. When the exchange rate rises, the inflation rate falls, and vice versa. All in all, the target of reducing inflation to 2% is critical to Malaysia’s economic competitiveness and long-term goals. This study suggests that investors can refer to exchange rates before making decisions. Upcoming studies could prioritize this research to provide better insights to policymakers and investors.

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

The structure of this chapter is as follows: The study topic is briefly summarized in the research backdrop, and the significance of the research and any potential issues are explained in the problem statement. Next, this research also addresses the goals and inquiries it has, the hypotheses it has, and the importance of the research. Finally, this research includes a hypothesis, a chapter structure, and a brief conclusion.

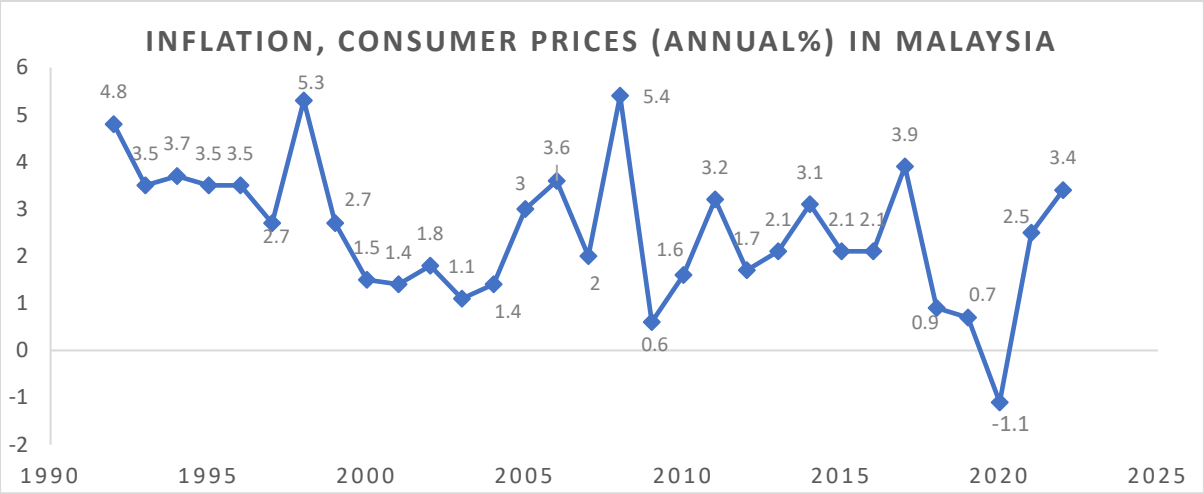
1.1 Research Background

Inflation poses an ongoing challenge globally, affecting policymakers' efforts to maintain affordable living standards, promote economic growth, and ensure overall economic health. (Hashim et al, 2014). A progressive rise in the cost of goods and services over time is known as inflation, and it can affect the economy positively or negatively. (Liwan & Lau, 2007). The Consumer Price Index (CPI), which calculates the percentage change in the price of a typical "basket" of goods and services over time, is the primary indicator used to assess inflation. (DOSM, 2022). CPI reflects the average price of an economy and is an important indicator for formulating macroeconomic policies.

It is widely acknowledged that there exist two primary forms of inflation: inflation driven by costs and inflation driven by demand. Demand-side variables including increases in the money supply, government expenditure, and exports are referred to as demand-pull

inflation. In contrast, cost-push inflation refers to supply-side factors such as rising raw material prices and rising wages. (Islam et.al, 2017).

Figure 1.1 Inflation, Consumer Prices (Annual %)



Source: World Development Indicators (World Bank)

Based on Figure 1.1 which is the inflation rate in Malaysia from 1992 to 2022. Inflation in Malaysia fell from 3.5% to 2.7% in 1997, remained stable in 1999, but surged to 5.3% in 1998. Throughout the 1990s, domestic supply factors, especially those related to food, played an important role in driving changes in Malaysia's inflation rate. Labor shortages, government adjustments to price levels, poor weather conditions, and limited land for cultivation resulted in food supply constraints during this period. This has led to higher prices for fruits, vegetables, and fresh market commodities such as fish and meat (Khai, 2011).

Malaysia's inflation rate rose sharply in 1998, from 2.7% to 5.3%. The reason for this was that, by the end of 1997, the US dollar's value relative to the ringgit had declined by about 28.2%, driving up import prices and expenses. The government set price restrictions on five key controlled items—milk, sugar, cooking oil, wheat, and chicken—to address the issue. In the early 2000s, Malaysia's inflation rate remained low due to the lingering effects of the supply and demand pressures of the 1990s.

Then, between 2000 and 2004, Malaysia's inflation rate hovered around 1%. However, it began to increase in 2005, reaching a peak of 5.4% in 2008. The major factors of the spike in inflation at this time were the global financial crisis and the skyrocketing costs of food and commodities globally. In 2014, Malaysia's inflation rate rose from 2.1% to 3.1%. This pattern reflects several inflationary forces in Malaysia.

In 2008, Malaysia experienced 5.4% of the highest inflation rate, while -1.1% lowest inflation rate in 2020. In recent years, Malaysia's inflation trend has been affected by a combination of internal and external economic factors. It is important to note that big events like the Russia-Ukraine conflict and the COVID-19 epidemic have had a big influence on the Malaysian economy. The pandemic, characterized by a demand shock, caused Malaysia's inflation rate to fall significantly, reaching negative territory in 2020. Contributing factors include low global oil prices and changes in consumer behaviour due to movement restrictions and sector closures (Bank Negara Malaysia, 2020). In response, the Malaysian government implemented measures such as provident fund (EPF) withdrawals and suspensions to ease the financial burden. However, in 2021, inflationary pressures began to re-emerge due to higher prices for basic commodities such as chicken, eggs, cooking oils, fish, and seafood, as well as disruptions to wheat supply chains caused by the conflict between Ukraine and Russia (DOSM, 2022).

As of June 2022, Malaysian inflation rebounded, increasing to 2.5% compared to the previous quarter of 2021 (DOSM, 2022). Malaysians are becoming increasingly concerned about rising costs of living, which emphasizes how crucial it is to use the Consumer Price Index to measure inflation effectively. Additionally, understanding the factors that influence inflation is critical because they directly impact decisions aimed at maintaining economic stability.

A prosperous economy typically experiences moderate levels of inflation, which in turn supports lower interest rates and stimulates borrowing and spending. However, excessive inflation burdens consumers, making it difficult to purchase essential goods and disrupting

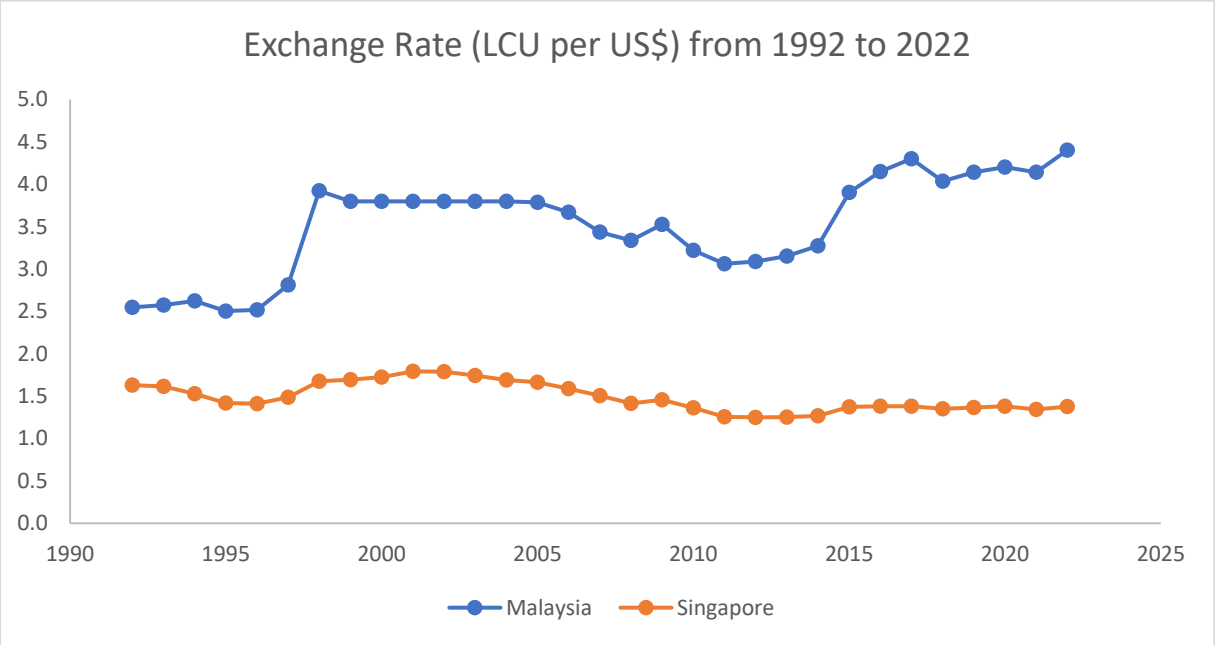
market dynamics (Hashim et al, 2014). As a result, controlling inflation is essential to maintaining both population health and sustained economic growth.

1.2 Problem Statement

Inflation is a global problem that has not been solved until today. It may be defined as a currency depreciation that causes prices of goods and services to steadily rise, eventually leading to a decline in buying power.

In recent decades, global events such as the U.S.-China trade war, the COVID-19 pandemic lockdown, and the war in Ukraine have disrupted global supply chains and affected countries around the world. Malaysia has been grappling with inflation caused by several factors. Take the COVID-19 epidemic as an example. In 2020, Malaysia's inflation rate dropped sharply into negative territory. This may be due to government relief programs, which are designed to support or help individuals and businesses get through tough times. But it also leads to an increase in the money supply, which might increase inflation.

Figure 1.2 Comparison of the Exchange rate (LCU per US$) between Malaysia and Singapore from 1992 to 2022



Source: World Development Indicators (World Bank)

Currencies may cause fluctuations based on economic conditions in foreign markets. (Mohd et al., 2016). Consequently, the currency depreciates about other currencies as the exchange rate declines. According to Figure 2.1, compared with Singapore, Malaysia's exchange rate fluctuates greatly and depreciates in comparison. As the exchange rate rises and cash flows increase, this may further exacerbate inflationary pressures in Malaysia. In addition, exchange rate depreciation will also affect production costs and import prices, which may lead to a decline in purchasing power. Therefore, it can be assumed that exchange rates and inflation have a similar relationship (Monfared & Akin, 2017).

Although most studies indicate an indirect relationship between GDP and inflation. Munira et al. (2012) and Kasidi and Mwakanemela (2013), this study aims to examine whether GDP directly affects inflation in Malaysia. For instance, in prosperous economic times, higher investment and consumer spending may raise the demand for products and services, which would raise prices and ultimately cause inflation.

For example, the Asian financial crisis and the COVID-19 epidemic in the late 1990s caused Malaysia's unemployment rate to surge. As a result of the recession, companies have laid off workers or ceased operations to stay afloat, especially in the manufacturing and construction sectors, which has also led to a surge in unemployment. This situation may have contributed to the decline in Malaysian inflation seen in the late 1990s (1.5%) and 2020 (-1.1%), as reduced consumer spending and economic activity may have reduced inflation to abnormal levels.

While previous study examines the overall effects of inflation on ASEAN nations, there is still a deficiency in the data about Malaysia. Research that has already been done frequently lacks thorough analysis that considers several economic variables at once. By examining the intricate link between inflation, several economic indicators, and the collective forces that drive inflation in Malaysia, this research seeks to close this gap. Thus, using independent variables such as money supply (MS), unemployment rate (UN), gross domestic product per capita (GDP), and exchange rate (ER), this study will investigate the causes influencing inflation in Malaysia.

1.3 Research Questions

1. What is the relationship between Inflation and Money Supply (MS), Unemployment (UN), GDP per capita (GDP), and Exchange Rate (ER) in Malaysia?
2. Which determinants have the highest impact on inflation?

1.4 Research Objectives

The general and specific objectives of the study are listed in this section.

1.4.1 General Objectives

The purpose of this study is to investigate the influences of a few chosen independent variables on inflation in Malaysia. Using time series data, four chosen independent variables were included: GDP per capita (GDP), exchange rate (ER), unemployment (UN), and money supply (MS).

1.4.2 Specific Objectives

1. To identify the relationship between Inflation and Money Supply (MS), Unemployment (UN), GDP per capita (GDP), and Exchange Rate (ER) in Malaysia.
2. To identify the determinants that have the highest impact on inflation.

1.5 Hypothesis of the Study

In this study, four hypotheses were chosen to determine the relationship between inflation and the factors of independent variables towards it in Malaysia.

1.5.1 Money Supply (MS)

H_0: There is no significant relationship between inflation and money supply.

H_1: There is a significant relationship between inflation and money supply.

1.5.2 Unemployment (UN)

H_0: There is no significant relationship between inflation and unemployment.

H_1: There is a significant relationship between inflation and unemployment.

1.5.3 GDP per capita (GDP)

H_0: There is no significant relationship between inflation and GDP.

H_1: There is a significant relationship between inflation and GDP.

1.5.4 Exchange Rate (ER)

H_0: There is no significant relationship between inflation and exchange rate.

H_1: There is a significant relationship between inflation and exchange rate.

1.6 Significance of Study

The topic of this research is "Factors Affecting Inflation in Malaysia", which is of great significance. Its research results provide powerful information for decision-making in formulating economic regulations and help formulate more targeted inflation and economic policies. The growth and expansion of many countries' economies have always been significantly hampered by inflation. Policymakers will be better equipped to comprehend the possible association between inflation and independent factors according to the study's findings. In the end, it is anticipated that this study will add to the body of knowledge already available

on the variables influencing inflation and encourage more economic research. Its importance lies in providing useful information for policy, investment, and decision-making to promote national economic stability and sustainable development.

1.7 Chapter Layout

Chapter 2 will review previous research literature and introduce relationships and theories between variables. Chapter 3 Methodology part will include data collecting strategies, sample size, measurement scale, study design, and data analysis strategies. The data analysis part, which displays the test findings and their interpretation, is presented in Chapter 4. The main findings will be covered in the discussion and conclusion section of Chapter 5.

1.8 Conclusion

The forthcoming investigation is introduced in this chapter. An outline of Malaysian inflation and the research background is given at the outset. It also looks at the interactions between inflation and variables including the money supply, unemployment rate, GDP per capita, and exchange rates. This part provides a framework for the next chapters by outlining the direction and scope of the study.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

2.1 Review of the Literature

Regarding the connection between macroeconomic conditions and inflation, there have historically been conflicting and divergent opinions. As a result, the link between inflation (CPI) and independent variables will be covered in detail in the literature review of this study. This essay will first go over the claims made by earlier academics on the link between inflation and all independent variables in studies or the literature. The following section discusses the theoretical underpinning for inflation and macroeconomic factors. Lastly, an explanation is provided for the chapter summary and the study's proposed theoretical model.

2.1.1 Money Supply (MS)

Cheng and Tan (2002) examined the effect of money supply on inflation in Malaysia using quarterly data spanning from the first quarter of 1973 to the second quarter of 1997. Their findings indicate that the money supply has a considerable positive influence on inflation and imply that adjustments to the money supply may intensify inflationary pressures. Armesh and Salarzehi (2010) use yearly time series data from 1961 to 2005 to investigate the factors that influence inflation in Iran. Using the ordinary least squares (OLS) approach, they verified the positive link between money supply and inflation, showing that an increase in money supply leads to inflation. An increase in inflation. Additionally, Rabiul et al. (2017) and Christensen

(2001) noted that there is a positive correlation between the money supply and inflation. and underlined how raising the money supply through expansionary monetary policy contributes to inflation. Additionally, Malaysian Ndiaye et al. (2017) investigated whether targeting inflation is the goal of the proper monetary policy regime in a dual-bank system. The findings indicate that the money supply and inflation have a substantial long- and short-term connection.

On the other hand, however, not statistically significant, other research indicates a positive correlation between money supply and inflation. As a result, it is suggested that the money supply does not accurately reflect actual consumer spending patterns and has minimal effect on inflation. Tong and Poon (2009).

2.1.2 Unemployment (UN)

Firstly, Malaysia research studies from Rabiul et al. (2017), which had regressed time series data, suggest that unemployment significantly influenced inflation with a p-value of 0.0027, enough to reject the null hypothesis at a 5% significant level. When the unemployment rate rises, the labour market is significantly impacted, bringing down the aggregate demand as a firm's productivity is significantly affected. Similarly, research by Najihah et al. (2021) on the factors influencing the inflation rate in Malaysia sampling 30 years of data were regressed. The tabulated result showed that unemployment has a coefficient of -0.4509 with a p-value of 0.0068, supporting the fact that the unemployment rate negatively relates significantly to the inflation rate in Malaysia.

Meanwhile, Furuoka & Munir (2014), empirical research has been done to provide evidence of the impact of unemployment on inflation in Malaysia. Analysis was applied to test the Phillips curve's suggestion of the negative relationship between the unemployment rate and inflation with yearly data sampled. The test suggested that unemployment had a significant short-run impact on the inflation rate. It came out with the fact that the Phillips curve does point out the fact that unemployment is negatively associated with inflation. Lastly, the Phillips curve

theory strongly suggests a negative relationship between unemployment and inflation (Rabiul et al., 2017). This phenomenon can be explained when an increase in aggregate supply would not assort aggregate demand because most of the resources will be fully used. After all, firms will push the price level upward. At the same time, unemployment will be relatively low as the demand for production requires human resources.

2.1.3 Gross Domestic Product (GDP)

The relationship between inflation and economic growth has long been a source of discussion, drawing the interest of macroeconomists, decision-makers, and monetary authorities worldwide (Aziz, 2016). In the field of macroeconomics, the link between inflation and economic growth is still hotly contested. A range of possibilities, including a negative association, a positive relationship, or no relationship at all between inflation and economic growth, have been presented by earlier research and hypotheses on this topic (Majumder, 2016).

Inflation, in the opinion of Kasidi and Mwakanemela (2013), hinders Tanzania's economic expansion. The GDP and inflation seem to have a statistically significant negative association in the short run. Furthermore, Munyeka (2014) and Madarapperuma (2016) demonstrated that there is a substantial inverse link between inflation and economic growth over the long term.

On the other hand, other research has examined the positive correlation between inflation and economic expansion. Using data from Malaysia from 1970 to 2011, Naseri and Zada (2013) found that inflation significantly boosts economic development in Malaysia. Hussain (2011) and Malik and Chowdhury (2001) have also demonstrated that inflation and economic growth are positively correlated.

2.1.4 Exchange Rate

The exchange rate, as seen from a financial standpoint, shows how much one country's currency is worth about another. It also represents the economy's perception of inflation and serves as a currency strength indicator.

Some studies prove that exchange rates and inflation have a negative relationship. Exchange rates and inflation have a substantial negative correlation, according to research by Onyekachi and Onyebuchi (2016). The study's findings, however, indicate that there is little relationship between exchange rates and inflation. The ordinary least squares (OLS) approach was used to investigate the link between Pakistani inflation and the exchange rate, based on the research of Khan, Bukhari, and Ahmed (2007). It proved to have a significant effect on it. The cost of imported products and services will rise if the exchange rate declines. It will thus cause inflation in the national economy. In addition, there is a clear correlation between inflation and currency rates. Tan and Cheng (2002). They examined the connection between Malaysia's inflation and exchange rate using the VECM test. They clarified that commerce, technology, and foreign direct investment all contribute significantly to Malaysia's economic progress as an open country. Nevertheless, it demonstrates that there is a transient positive association and a short-term negative correlation between inflation and the exchange rate. In addition, Olatunji et al. (2010) examined the variables influencing Nigerian inflation using time series data. The findings indicate that inflation rate is negatively impacted by exchange rate.

2.2 Review of Relevant Theoretical Models

2.2.1 Quantity Theory of Money

The money supply within the economy Excesses can cause domestic inflation, according to the quantity theory of money within the framework of the monetarist model, as elaborated by

Milton Friedman (1969), who is widely regarded as the creator of monetarism and winner of the Nobel Prize in Economics. Additionally, he made the well-known claim that inflation was always a general monetary phenomenon, contending that variations in the money supply or money stock were the only factors influencing changes in the level of prices generally. According to the idea, a given percentage increase in the money supply results in a similar percentage increase in the price level. Moreover, it demonstrates that while a rise in the money supply causes inflation, an increase in economic production is not always the result.

According to the quantity theory of money, the money supply and the level of prices have a strong, direct correlation. This link may be shown with the following quantity of money equation.

$$Quantity\ Theory\ of\ Money: MY = PY$$

Where,

M= Money supply

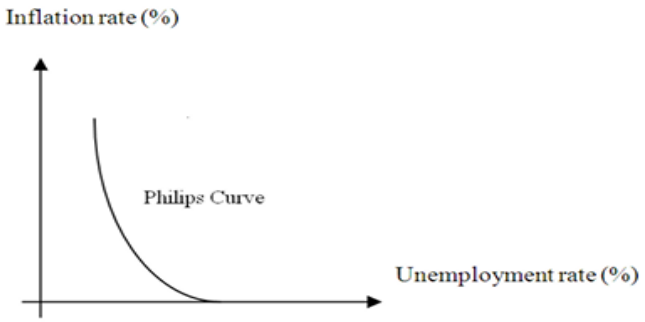
V= Velocity of circulation of money

P= Price level

Y= Real national income.

2.2.2 Philips Curve

Figure 2.1: Philips Curve



Adapted from: Khai, T. M. (2011). Determinants of inflation in Malaysia 1981 2010. *Master's research report. The graduate school of business, Universiti Sains Malaysia*.

The relationship between inflation and unemployment rates in an economy is depicted by the Philips Curve. There are shortages in the labour market and an excess of demand over supply when there is full employment. Salaries will rise under pressure from this circumstance. Companies will raise the pricing of related goods and services in order to pass on the increased costs to customers because salaries make up a large part of overall expenditures. The end effect has been a rise in the general price level.

In 1958, William Philips put out the idea that unemployment and inflation are trade-offs. The term "Philips Curve" refers to this connection, which presupposes a negative association between these variables. Many researchers have tried to confirm Philips's theory—that there is an inverse link between unemployment and inflation—ever since it was first proposed. Essentially, as unemployment rises, inflation tends to fall, and vice versa. A graphical representation of this relationship is shown in the figure, emphasizing the negative correlation between inflation and unemployment.

Furthermore, authorities and central banks place a great deal of emphasis on the Philips Curve notion, which has gained widespread acceptance. (Islam and others, 2017). Central banks often use this curve to provide insights into setting policy goals of controlling inflation rates to stabilize prices. Therefore, under this principle, the central bank formulates monetary policy to maintain the inflation rate at a controllable level. Therefore, Philips curve adaptability is a key factor for policymakers and central banks in the decision-making process.

2.2.3 Purchasing Power Parity

A key component of the money and portfolio balance models is the purchasing power parity model. Onyekachi & Onyebuchi (2016) state that the relative price level determines the exchange rate in the buying power evaluation model. The exchange rate fluctuates in tandem with changes in the level of prices. Using the disparity in inflation rates between two nations, this hypothesis aims to explain the average value of the exchange rate. When nation A's inflation rate increases in comparison to country B, exports decline and imports increase, which results in a depreciation of the country's currency. Thaddeus, Anyaogu, and Ebiringa (2014). This theory insists that exchange rate changes are caused by differences in inflation rates and attempts to quantify the relationship between inflation and exchange rates.

2.2.4 Aggregate Demand and Aggregate Supply (AD-AS) Model

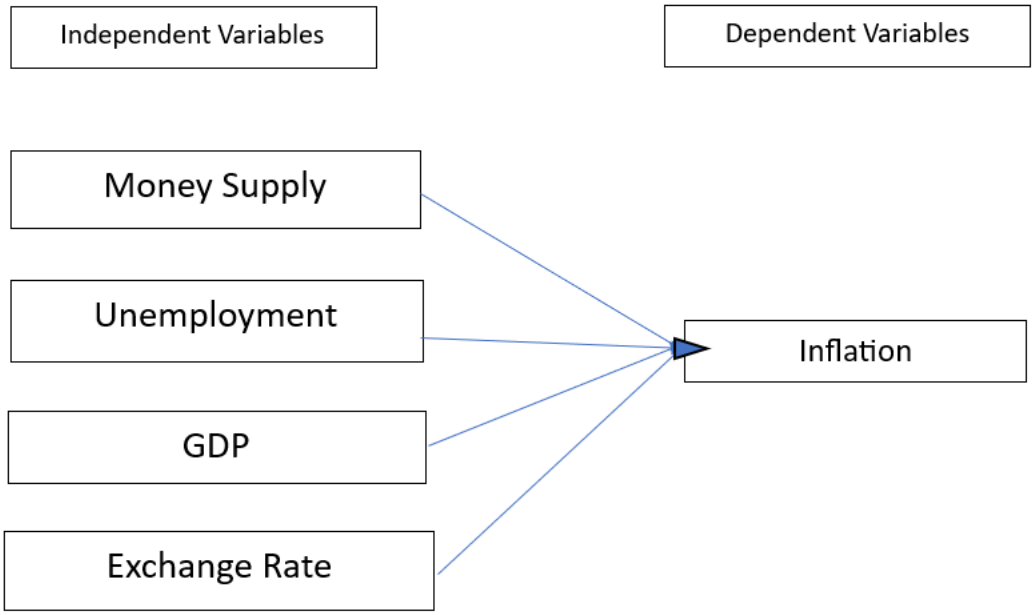
In theory, there is a positive correlation between inflation and economic growth according to the conventional Keynesian aggregate demand (AD) and aggregate supply (AS) paradigm. The aggregate give (AS) curve slopes higher in the short term, according to this model. Changes in aggregate give (AD) therefore have an impact on the prices and production levels of a nation. This can be explained by the fact that inflation results when supply cannot keep up with rising demand. As a result, prices rise overall. In Khai (2011). It encompasses shifts in the labor force, fiscal or monetary policy, and expectations. Furthermore, the idea of time inconsistency issues

could also have an impact on the primary causes of the expansion of positive short-term inflation. (Tai and others, 2017). In contrast, a vertical aggregate supply (AS) curve will eventually result in changes in aggregate demand (AD) that solely impact the price of level rather than the level of output. This is because of the difficult road that the positive link between inflation and growth will take to go from a protracted decline to a negative association.

2.3 Proposed Conceptual Framework

The conceptual framework supported by the evaluated literature is depicted in Figure 2.3. The link between the independent and dependent variables is shown by the framework. The association between the four chosen factors and Malaysian inflation is depicted in Figure 2.3.

Figure 2.2: Conceptual Framework



Source: Developed for Research

The money supply, unemployment rate, GDP, and exchange rate are the four independent variables that influence inflation, as shown in Figure 2.1. It has been established that the four independent variables—money supply, unemployment rate, GDP, and exchange rate—have a substantial impact on inflation. Thus, the purpose of this study is to determine if inflation is significantly influenced by the four independent factors.

2.4 Hypothesis Development

Each independent variable will be tested by comparing it to the null hypothesis ($H0$). The null hypothesis is rejected if the probability is below a predetermined significance level, in which case the hypothesis to be proved is considered to have that significance level. The alternative hypothesis ($H1$) represents the independent variables that are significantly related to inflation between 1992 and 2022. Therefore, 4 hypotheses are proposed:

$H_{1\ (1)}$: The relationship between money supply and inflation in Malaysia is significant.

$H_{1\ (2)}$: The relationship between unemployment and inflation in Malaysia is significant.

$H_{1\ (3)}$: The relationship between GDP and inflation in Malaysia is significant.

$H_{1\ (4)}$: The relationship between exchange rate and inflation in Malaysia is significant.

2.5 Conclusion

To put it briefly, earlier research has demonstrated a substantial correlation between the independent and dependent variables. Few current data on Malaysia; instead, most research concentrates on certain ASEAN nations or countries. As a result, several investigations will provide various findings. We shall examine the elements influencing Malaysian inflation and its interrelationships in the upcoming chapter.

CHAPTER 3: METHODOLOGY

3.0 Introduction

The approach outlines the proper way for a researcher to carry out a study. It makes clear what the challenge should entail for researchers as well as the outcomes of the information gathered for the investigation. This chapter explains the process by which the research objectives were used to determine the study outcomes. It also describes the analytical techniques applied during the investigation.

3.1 Research Design

The purpose of this chapter is to provide an appropriate basis for research. As a result, during the research design phase, several interconnected decisions are made that have an impact on the acquisition of pertinent data for the study.

The procedures followed and the tests that will be administered are covered in this chapter. To gather information, this study used a quantitative method to gather and evaluate numerical data. This is due to its ability to forecast results, identify averages and trends, look into sporadic correlations, and extrapolate results to broader groups. The money supply, unemployment rate, GDP per capita, and exchange rate are employed as independent variables in this analysis, with inflation serving as the dependent variable. The World Bank (WDI) and the Department of Statistics Malaysia (DOSM) are the sources of the data, which was gathered between 1992 and 2022.

3.2 Data Collection Methods

The data collection method is a common research approach. It may be claimed that regardless of the research's methodology—qualitative or quantitative—accurate data collection is essential to preserving the integrity of the study.

3.2.1 Secondary Data

To identify and measure the relationship of variables, we used secondary data to collect research information. In this research, data on dependent and four independent variables were collected between 1992 and 2002. All secondary data come from the World Bank database and the Department of Statistics Malaysia (DOSM). These variables include consumer price index (CPI) as dependent variable and money supply (MS), unemployment (UN), GDP per capita (GDP), and exchange rate (ER) as independent variables.

3.3 Empirical Model

"Empirical model" refers to the process of generating a model through experimentation and observation. The empirical model can yield reliable findings if it is founded on a substantial volume of test data. Researchers will examine how inflation and other independent factors relate to one another in this study.

3.3.1 Basic Model

This study adopts the fundamental model that Cheng & Tan (2002) proved, as well as the logarithm of all variables because the goal is to determine the link between inflation and other independent factors. The basic model is written as below:

$$CPI_t = \beta_0 + \beta_1 MS_t + \beta_2 UN_t + \beta_3 GDP_t + \beta_4 ER_t + \varepsilon_t \quad \text{---- (1)}$$

The model in natural logarithm is written as below:

$$LNCPI_t = \beta_0 + \beta_1 LNMS_t + \beta_2 LNUN_t + \beta_3 LNGDP_t + \beta_4 LNER_t + \varepsilon_t \quad \text{--- (2)}$$

Where,

LNCPI = Logarithm form of Consumer Price Index

β_0 = Slope coefficient

LNMS = Logarithm form of Money Supply

LNUN = Logarithm form of Unemployment rate

LNFDP = Logarithm form of GDP per capita

LNER = Logarithm form of Exchange rate

ε_t = Error term

3.4 Data Processing

The data processing indicates that each variable's data was initially located and gathered by the Department of Statistics Malaysia (DOSM) and World Bank indicators. For every variable, the same amount of observations should be made. Correlation testing and descriptive analysis must then be performed on the original data. Both the Granger causality test and the unit root test are run. OLS regression will be carried out in accordance with the findings. Lastly, in order to avoid mistakes, residual diagnostic tests are conducted.

3.5 Data Analysis

3.5.1 E-views

E-Views software is a statistical software package used for general analysis in econometrics. This software can analyze data types in econometrics such as time series, panel data, etc. The software also provides analysis, forecasting, and modeling tools. Most universities, businesses, and research institutions use E-Views for econometric purposes. In this case, E-View was very useful for this study. By using E-Views, I can run everything that I listed before, e.g., descriptive analysis, correlations, unit root tests, OLS regression, etc. The data in this study were prepared by other persons or institutions in the past for their own purposes.

3.5.2 Descriptive Analysis

Descriptive analysis refers to appropriate methods of displaying data and results. It can present some useful information and provide a summary of all the data. Graphs, tables, and charts can be displayed in descriptive analysis. Large amounts of data can be summarized through descriptive analysis. The mean, median, variance, and standard deviation will be calculated to summarize the data.

Descriptive analysis helps reduce data to a manageable size by drawing charts and tables or calculating degrees of summary. This study strongly requires descriptive analysis for summary and conclusion.

3.5.3 Scale Measurement

There are a total of five variables for the study. The scale of the measurement is below:

Table 3.1: Scale Measurement Table

Variables	Measurement of Data	Source
CPI	Consumer Price Index (2010= 100)	World Bank
MS	Broad Money (Current LCU)	World Bank
UN	Unemployment Rate (%)	Department of Statistics Malaysia (DOSM)
GDP	GDP per capita (constant 2015 US$)	World Bank
ER	Real Effective Exchange Rate (2010=100)	World Bank

Source: Developed for Research

3.5.4 Correlation Analysis

Correlation analysis refers to testing the relationship between dependent variables and independent variables. The results show the positive or negative correlations. This will determine whether two variables have a strong or weak correlation. When two variables are positively correlated, it means that the two variables will influence each other in the same direction. This also means that when one of the variables increases, the other variable also increases. On the contrary, if two variables are negatively correlated, it means that an increase in one variable will cause a decrease in the other variable.

Correlation is an effect size and so can be used to describe the strength of the correlation by using the guide that Senthilnathan (2019).

Table 3.2: Strength of Correlation

Strength of correlation coefficient	Correlation Value
Very Strong	0.80 – 1.00
Strong	0.60 – 0.79
Moderate	0.40 – 0.59
Weak	0.20 – 0.39
Very Weak	< 0.20

3.5.5 Unit Root Test

A test that verifies that every variable in the procedure is stationary is known as the unit root test. If not, the regression model will be unreasonable since all variables will be stagnant. (2010) Hafizah and Hussein. A variable is deemed to have a unit root or to be non-stationary if both the mean and variance exhibit temporal variation. To avoid misleading regression issues, all variables must be balanced; this may be done by running a few unit root tests. The Philips Peron (PP) test and the enhanced Dickey-Fuller (ADF) test were employed in this investigation.

3.5.5.1 Augmented Dickey-Fuller (ADF) test

A popular technique for determining if a variable has a unit root is called the ADF test. The test statistic has a negative value, and the greater the rejection of the hypothesis, the lower the value.

This certainty, nevertheless, is limited to a certain extent. After explanation, it is agreed not to reject the null hypothesis of a unit root if the ADF test is positive. The hypothesis of the ADF test will be shown below:

H_0: The time series data is unit root and non-stationary.

H_1: The time series data has no unit root and is stationary.

The unit root hypothesis of the ADF can be rejected if the t-test statistic is less than the critical value with a significant level of 0.01, 0.05, or 0.10. In other words, to be said that reject the null hypothesis when it is stationary.

3.5.5.2 Philips-Perron (PP) test

The ADF test and the Philips-Perron test are comparable tests; however, the PP test adjusts for strong serial correlation or adjusted coefficient t statistic. The way the Philips-Perron (PP) test handles serial correlation and heteroskedasticity of the error components distinguishes it from the ADF test. When utilizing time series data, the non-parametric test in the unit root test is referred to as the PP test. Every serial correlation in the regression is ignored by the PP test. The best lag duration for the regression may be found without using the PP test. Nonetheless, the PP test estimates the general form of heteroscedasticity in the error term. The hypothesis of the PP test will be shown below:

H_0: The time series data is unit root and non-stationary.

H_1: The time series data has no unit root and stationary.

The unit root hypothesis of the PP test can be rejected if the t-test statistic is less than the critical value with a significant level of 0.01, 0.05, or 0.10.

3.5.6 Granger Causality

Granger causality refers to the test estimate of the causal relationship between two variables in time series data. This test explains how the past dependent variable explains the current dependent variable and adds lagged values to the independent variables to ensure whether the explanation can be improved. (Granger, 1969). The hypothesis of Granger Causality will be shown below:

H0: There is no granger that does cause a relationship between independent variables and dependent variables.

H1: There is a granger does not cause a relationship between independent variables and dependent variable.

As a result, it can be concluded that the direction of causation of the two variables is bidirectional, while only one variable is significant in a test called unidirectional. For example, if the F statistic of two variables (x and y) is significant at the 0.01, 0.05, and 0.10 levels in the causal direction. From the results, it can be concluded that the two variables are cointegrated and have a long-term relationship with each other. However, if Y is significant to X but X is not significant to Y, it can be concluded that there is no cointegration relationship with each other and no long-term relationship.

3.5.7 Ordinary Least Square

The ordinary least squares (OLS) approach was employed in this investigation to estimate the regression patterns. The association between dependent and independent variables is found using the OLS technique. R^2 in the OLS approach indicates the model's strength. The regression model is better the higher the R^2 value. The F test is further used to demonstrate the importance of the regression model and gauge the model's effectiveness. The relevance of the independent

variable on the dependent model is finally displayed by the t-statistic. Therefore, it is possible to observe which independent variables are affected by the inflation rate in Malaysia.

3.5.8 Diagnostic Checking

Several tests were conducted to test the usability of econometric issues such as multicollinearity, autocorrelation, normality, and heteroskedasticity in regression models. In the event that a model has these problems, the diagnostic checks to make sure the model is unaffected by them will be skewed, inconsistent, and erroneous.

3.5.8.1 Normality Test

The normality test is used to identify whether a data set is distributed from a normal distribution through the histogram of a regression model. If the error pattern in the histogram is normally distributed, its error pattern should be bell-shaped. However, error histograms are not a formal method of testing error normality. The Jarque Bera test refers to a formal method of detecting error terms. Here, the test will use the skewness of the error and the kurtosis is equal to 3 or very close to 3. The hypothesis of the Jarque Bera Test will be shown below:

H0: There is normally a distribution of errors in the regression model.

H1: There is no normal distribution of errors in the regression model.

The null hypothesis of the normality test will be rejected if the p-value for the Jarque Bera Test is less than the level of significance.

3.5.8.2 Heteroscedasticity Test

Heteroskedasticity is the word used to describe an error term whose variance is not constant. That goes against the OLS presumption. In the face of heteroscedasticity issues, the OLS estimator maintains its linear and impartial nature. This will lead to a biased and inefficient variance. The standard error of the coefficient will be broken since the t-test and F-test are null, which will lead to erroneous findings from the hypothesis test. The hypothesis of heteroscedasticity will be shown as below:

H0: The model does not contain a heteroscedasticity problem.

H1: The model contains a heteroscedasticity problem.

The null hypothesis in the white heteroscedasticity test will be rejected if the test's OBS*R^2 is greater than the test critical value or the p-value of OBS*R^2 is smaller than the level of significance.

3.5.8.3 Autocorrelation

The degree of the correlation between the same variables across two successive time intervals is known as autocorrelation or serial correlation. With values ranging from negative one to one, autocorrelation may be classified as either positive or negative. A value between 0 and 1 denotes positive autocorrelation, while a value between -1 and 0 denotes negative correlation. The hypothesis of Autocorrelation will be shown below:

H0: The model does not contain an autocorrelation problem.

H1: The model contains an autocorrelation problem.

The null hypothesis will be rejected if the p-value is smaller than the significance value.

3.5.8.4 Multicollinearity Test

When more than two independent variables in a regression model have a strong correlation, this is known as multicollinearity. For all other independent variables in this test, each independent variable in the regression acts as the dependent variable. Issues with multicollinearity can be identified with the variance inflation factor (VIF). There is no issue with multicollinearity when VIF is 1 or less. However, significant issues with multicollinearity arise when the VIF surpasses 10. The hypothesis of Multicollinearity will be shown below:

H0: There is no multicollinearity problem.

H1: There is a multicollinearity problem.

The null hypothesis of the test will be rejected if the VIF value is less than one or equal to one.

3.8 Conclusion

To sum up, this chapter offers a thorough explanation of how to get them. There's also a comprehensive discussion of the research methodology employed. Results and empirical findings are covered in the upcoming chapter.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

The outcomes of many tests conducted using the E-Views 12 program will be examined and interpreted in this chapter. To estimate the regression model, the findings of unit root tests—such as the augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, Granger causality, ordinary least squares (OLS) tests, and diagnostic tests—such as the normality, heteroskedasticity, autocorrelation, and multicollinearity tests—will be interpreted.

After OLS regression and residual analysis, a short and clear conclusion is drawn. The following sections show the results and interpretations of all tests that were run and analyzed.

4.1 Descriptive Analysis

This test was run through the E-view 12 software. The data collected in the study are the original data. The descriptive analysis is shown below.

Table 4.1 data indicates that the consumer price index (CPI) has a mean of 4.5276 and a median of 4.5303. CPI has a maximum value of 4.8459 and a minimum value of 4.1290. The CPI's standard deviation is 0.2136, its skewness value is -0.2048, and its kurtosis value is 1.8788.

Besides, the mean for the MS is 27.3516 and a median of 27.4483, whereas the maximum value for MS is 28.3894 and the minimum value for MS is 25.7604. The standard deviation, skewness, and kurtosis value for MS are 0.7794, -0.3825, and 1.9628 respectively.

The median and mean value for UN is 1.1939 and 1.2111 respectively. And the maximum and minimum value of UN are 1.5261 and 0.8755. For UN, standard deviation, skewness, and kurtosis value are 0.1371, -0.0103, and 3.9773 respectively.

Moreover, the mean for the GDP is 8.9456 with a minimum value of 9.3413, maximum value of 9.3413, and the median of 8.9458. The GDP has a standard deviation of 0.2454, skewness of -0.0131, and kurtosis of 1.9205.

The median value for the ER is 4.5838, while the mean value of the ER is 4.5938. ER has a maximum of 4.8274 and minimum value of 4.4074. ER has the following values for skewness, standard deviation, and kurtosis, which are 0.6022, 0.1229, and 2.5168 respectively.

Table 4.1 Description Analysis

	CPI	**MS**	**UN**	**GDP**	**ER**
Mean	4.5276	27.3516	1.2111	8.9458	4.5938
Median	4.5303	27.4483	1.1939	8.9458	4.5838
Maximum	4.8459	28.3894	1.5261	9.3413	4.8274
Minimum	4.1290	25.7604	0.8755	8.4773	4.4074
Std. Dev.	0.2136	0.7794	0.1371	0.2454	0.1229
Skewness	-0.2048	-0.3825	-0.0103	-0.0131	0.6022
Kurtosis	1.8788	1.9628	3.9773	1.9205	2.5168

Source: Developed for Research

4.2 Correlation Analysis

Table 4.2 show the correlation between the dependent and independent variables.

Table 4.2 Correlation Analysis

Variables	CPI
MS	0.9951
UN	0.1980
GDP	0.9861
ER	-0.8816

Source: Developed for Research

In Table 4.2, the outcome shows that the CPI has a positive relationship with MS, UN, and GDP. And the CPI has a negative relationship with ER. The correlation between MS and CPI, and GDP and CPI has a very strong positive correlation. Besides, ER and GDP have a negative very strong correlation. Lastly, the UN and CPI have a positively weak correlation.

4. 3 Unit Root Test

Table 4.3 Unit Root Test

Variables	Augmented Dickey-Fuller Test Equation			Philips-Perron Test Equation		
	Level	1st Difference	2nd Difference	Level	1st Difference	2nd Difference
CPI	-2.2591	-4.4672***	-8.2386***	-2.3579	-4.4672***	-11.0304***
MS	-2.3162	-5.1824***	-9.6005***	-4.5363***	-5.3567***	-26.1684***
UN	-3.6766**	-5.0074***	-6.1224***	-2.4176	-4.7304***	-11.8835***
GDP	-1.0971	-5.2147***	-6.8985***	-1.1449	-6.1341***	-14.8252***
ER	-1.3869	-4.8351***	-6.9623***	-1.0962	-7.0276***	-14.0203***

Source: Developed for Research

H0: The time series data is the unit root

H1: The time series data is no unit root

According to the results of the study, most variables are balanced when considering the first and second differences levels (Δ1 and Δ2 data series). Therefore, it is recommended to adopt the Ordinary Least Multiply (OLS) method suggested by Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) tests for modeling.

4.4 Granger Causality Test

Table 4.4 Granger Causality Test

	F Statistics	Prob
ER does not Granger Cause CPI	0.0375	0.8479
CPI does not Granger Cause ER	0.0028	0.6511
GDP does not Granger Cause CPI	0.2093	0.6511
CPI does not Granger Cause GDP	0.2295	0.6359
MS does not Granger Cause CPI	2.0243	0.1667
CPI does not Granger Cause MS	1.8272	0.1881
UN does not Granger Cause CPI	0.02636	0.8723
CPI does not Granger Cause UN	0.4443	0.5109

Source: Developed for Research

The Granger causality test indicates that there is no long-term equilibrium link and no cointegration relationship between the independent variables (ER, GDP, MS, and UN) and CPI at the statistical significance level of α0.05.

4.5 Ordinary Least Square (OLS) Regression

In the first difference data, every variable is stationary, based on the unit root result. OLS regression is thus used to determine how the independent factors affect the dependent variable. The OLS regression equation is shown in below:

$$\Delta 1CPI_t = 0.0134_{t-1} + 0.0906\Delta 1lnMS_{t-1} + 0.0157\Delta 1lnGDP_{t-1} - 0.0457\Delta 1lnUN_{t-1} - 0.1611\Delta 1lnER_{t-1} + 0.0058_{et}$$

[1.7438*] [0.1260ns] [-1.2118ns]

[-2.8586***]

$R^2 = 0.3149$, Adjusted $R^2 = 0.2053$

Δ1= first difference data

lnMS= logged of Money Supply

lnGDP= logged of GDP

lnUN= logged of unemployment rate

lnER= logged of exchange rate

Based on the OLS model, the results shown that the explanatory variables accounted for about 31.5% of the variation in the Δ1CPI equation.

The estimation reveals that the explanatory variables, namely lnΔ1MS and lnΔ1ER in the lag period were the most important explanatory variable with statically significance at the level of 0.10 level and 0.01 level respectively.

Therefore, one unit increase in lnΔ1MS, on average has a positive relationship effect increasing CPI by 0.0906 units statistically significance at α0.10 level.

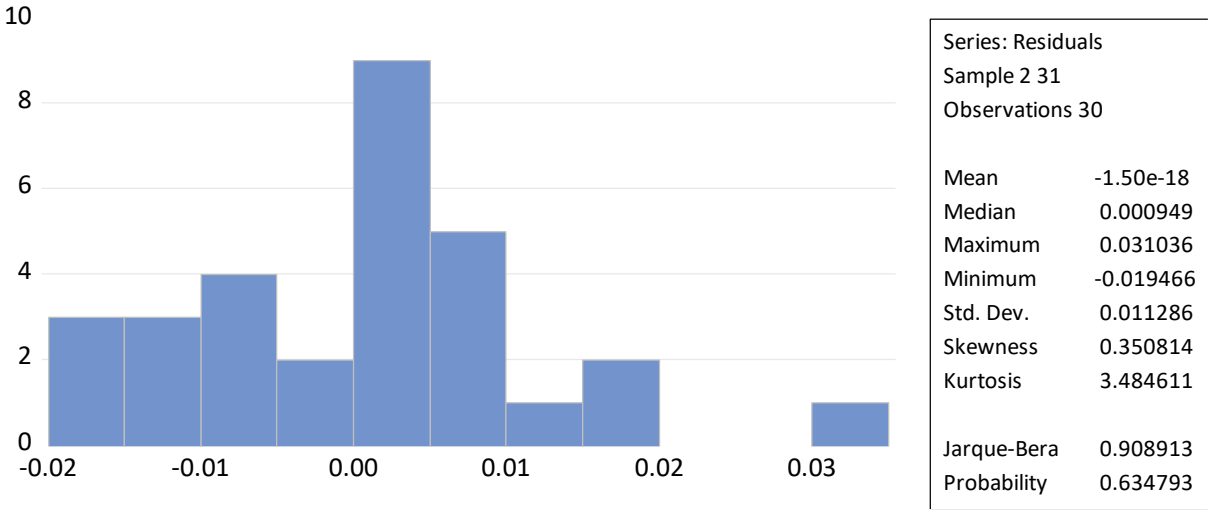
One unit increase in lnΔ1ER, on average has a negative relationship effect decreasing CPI by 0.1611 units statistically significance at α0.01 level.

4.6 Residuals Diagnosis

Four tests are used in residual diagnosis: multicollinearity, heteroskedasticity, serial correlation, and normality testing. The following are the outcomes of these tests, which were performed on models:

4.6.1 Normality Test

The Normality test results is shown as below:



Source: Developed for Research

H_0= The residuals are normally distributed

H_1= The residuals are not normally distributed

Since the p-value (0.6348) is greater than α0.05, do not reject H0. Therefore, there is not enough evidence to prove that the error term is not normally distributed at the α0.05 significance level. Therefore, we can summarise that the model satisfies the assumption of normality of the error term at the α0.05 significance level.

4.6.2 Serial Correlation LM Test

The Serial Correlation LM test is shown as below:

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 1 lag

F-statistic	0.036978	Prob. F(1,24)	0.8491
Obs*R-squared	0.046151	Prob. Chi-Square(1)	0.8299

Source: Developed for Research

H_0: The residuals have no serial correlation.

H_1: The residuals have a serial correlation.

Since the p-value of F (1,24) is 0.8491 which is greater than α0.05, therefore do not reject H_0. The residuals have no serial correlation.

4.6.3 Heteroscedasticity White Test

The heteroscedasticity test results are shown in below:

Heteroskedasticity Test: White
Null hypothesis: Homoskedasticity

F-statistic	0.579236	Prob. F(14,15)	0.8428
Obs*R-squared	10.52732	Prob. Chi-Square(14)	0.7227
Scaled explained SS	9.082048	Prob. Chi-Square(14)	0.8258

Source: Developed for Research

H_0: The residuals have no heteroskedasticity.

H_1: The residuals have heteroskedasticity.

Since the p-value of F (14,15) is 0.8428 which is greater than α0.05, therefore do not reject H_0. The residuals have no heteroskedasticity.

4.6.4 Multicollinearity Test

The calculation of multicollinearity test results is below:

H_0: The residuals have no multicollinearity.

H_1: The residuals have multicollinearity.

VIF= $1 / (1-r^2)$

= 1 / (1- 0.3149)

= 1.4590

Since the value of VIF (1.4590) is less than 5, therefore do not reject H_0. Thus, the residuals have no multicollinearity.

4.7 Summary of Hypothesis Testing

Based on the OLS regression, hypothesis testing has been done and the results shown below.

Table 4.7 Result of Hypothesis Testing

Hypothesis	Variables	Std. Error	T-statistic	Prob. Value	Conclusion
H_1	MS	0.0519	1.7438	0.0935*	Supported
H_2	UN	0.3769	-1.2118	0.2369ns	Rejected
H_3	GDP	0.1245	0.1260	0.9007ns	Rejected
H_4	ER	0.0563	-2.8586	0.0085***	Supported

Source: Developed for Research

Note: ***,**,* indicate to the rejection of the null hypothesis at significance levels 1%, 5%, and 10% respectively.

Table 4.7 shows that the probabilities of variables MS and ER are statistically significant. Therefore, there is a relationship between CPI MS, and ER. However, the probability values of variables UN and GDP are not significant. This means there is no relationship between CPI with the UN and GDP.

4.8 Conclusion

The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, Granger causality, Ordinary Least Squares (OLS) test, and diagnostic tests (normality, heteroskedasticity, autocorrelation, and multicollinearity) are examples of unit root tests that are presented in this chapter. The money supply (MS) and exchange rate (ER) are related to inflation; on the other hand, there is no correlation between inflation and GDP or the unemployment rate (UN). To make the data and conclusions easier to understand for the next researchers, all results have

been condensed using graphs and tables. The key conclusions, restrictions, and ramifications of this investigation are covered in more detail in the next chapter.

CHAPTER 5: CONCLUSION

5.0 Introduction

This chapter will summarize the empirical results from the previous chapter which is Chapter 4 and explain the details accordingly. Additionally, limitations arising from this study will also be thoroughly discussed. Finally, Chapter 5 provides some implications for further research.

5.1 Summary of Statistical Analyses

According to Chapter 4 results of the study, the correlation of CPI has a positive relationship with MS, UN, and GDP. And the CPI has a negative relationship with ER. The correlation between MS and CPI, and GDP and CPI has a very strong positive correlation. Besides, ER and GDP have a negative very strong correlation. Lastly, the UN and CPI have a positively weak correlation.

The unit-roots test for both equations (Augmented Dickey-Fuller Test and Philips-Perron Test) reveals that only one variable is significant at each level in each test which are UN and MS. In the first and second differences, all the variables are significant in two tests.

In the Granger causality test, there is no cointegration relationship between the independent variables (ER, GDP, MS, and UN) with CPI, and there is no long-term equilibrium relationship.

Furthermore, in OLS regression reveal that the MS and ER has a relationship while GDP and UN have no relationship.

Therefore, the CPI model shows that UN and ER have a negative impact on the CPI. However, MS and GDP have a positive impact on the CPI.

5.2 Discussions of Major Findings

5.2.1 Money Supply

The quantity theory of money states that the money supply and inflation are positively correlated. The inflation rate will rise in response to an increase in the money supply, and it will fall in response to a drop in the money supply.

The money supply was shown to be important in this study's model, which suggests that it will have an impact on Malaysia's inflation. Additionally, the study's findings indicated that there is a positive correlation between inflation and the money supply. It suggests that inflation will rise in tandem with an increase in the money supply. The outcome agrees with Cheng and Tan's (2002) findings.

The money supply was shown to have a considerable influence on inflation, according to Cheng and Tan's (2002) study, which examined this hypothesis using time series data from 1973 to 1997 in Malaysia. Additionally, its findings concur with those of Rabiul et al. (2017) and Poon & Tong (2009). These studies demonstrate that the money supply significantly affects inflation and has a positive link with it.

5.2.2 Unemployment rate

This study indicated a negative correlation between employment and inflation even though it did not find that employment had a substantial impact on inflation. This outcome is consistent with Furuoko (2007). This study examines the correlation between Malaysia's inflation and unemployment rates between 1973 and 2004. The results indicate a negative correlation between inflation and unemployment. This means that as inflation rises, unemployment tends to fall. This is consistent with past research showing no consistent negative association between the two. In the short term, however, the Philips Curve often presents a trade-off in which stronger economic growth and lower employment rates can lead to higher inflation.

5.2.3 GDP

According to the study's findings, there is a positive correlation between GDP and inflation. The results of this analysis are consistent with those of Mallik & Chowdhury's (2001) research, which finds that GDP and inflation in India have a long-term, positive association. Furthermore, the results of this study align with those of Hussain (2011).

Although GDP and inflation are not significant from the results, previous research has shown that economic growth may lead to overheating of the economy and trigger inflation fluctuations. Therefore, the Malaysian government still needs to focus on stable economic growth in line with inflation, rather than defeating inflation first to achieve faster growth.

5.2.4 Exchange rate

The test result indicates that, at a significance level of 1%, the exchange rate is significant. In addition, Malaysian inflation is being adversely affected by the currency rate. As previously said, the test result in this study matches the predicted indication.

Furthermore, the outcomes align with the findings of Onyekachi & Onyebuchi (2016), who discovered a negative correlation between inflation and the exchange rate in Nigeria. Furthermore, exchange rate and inflation have a statistically significant and negative association, according to Cheng & Tan (2002) and Olatunji et al. (2010).

Because exchange rate depreciation will raise input prices and production expenses, which would raise the cost of goods, there is a negative association between Malaysia's exchange rate and inflation. In turn, this will raise the general level of prices in the nation and cause inflation. Fluctuations in exchange rates will directly affect international companies, businesses, or investors, thereby affecting output and input prices.

5.3 Implication of the study

Inflation in Malaysia stems from the mismatch between falling aggregate supply and rising aggregate demand. However, research shows that the factors discussed are only a subset of the factors that influence inflation, given the low R-squared values. Inflation poses significant challenges, affecting economic growth, consumer prices, labor markets, and investor confidence. In response to high inflation, governments can use monetary policy tools such as credit controls to manage the quantity and quality of domestic credit. It is worth noting, however, that monetary policy may not be able to fully address inflation caused by cost-push factors. Extreme measures such as currency substitution can be considered in cases of hyperinflation. It is also recommended to encourage savings to curb inflation.

Investors are urged to consult exchange rates before to making decisions since they have the greatest influence on the CPI in this research. Inflation in Malaysia is significantly correlated negatively with the currency rate. Inflation rates decrease as exchange rates rise and vice versa. All in all, the target of reducing inflation to 2% is critical to Malaysia's economic competitiveness and long-term goals.

5.4 Limitation of study

A limitation of this study is that previous research and expected signals mostly observe country conditions. These circumstances may not be suitable for Malaysia. This is because the economic, social, and political contexts of different countries can differ significantly, leading to different outcomes and responses to similar factors. For example, economic policies, cultural norms, and institutional frameworks all influence the impact of certain variables on Malaysia's inflation compared to other countries.

Additionally, the 30 of sample size in this study may have attenuated the results and made them more difficult to interpret accurately. Due to the small sample size, the representativeness of the population may lack generalizability and robustness, thereby reducing the credibility of the research conclusions. When interpreting results, it is important to acknowledge the limitations of sample size and consider the potential bias or error introduced by small samples. Nonetheless, this limitation is acknowledged, does not diminish the importance of the findings, and can provide a platform for future research.

5.5 Recommendations for Future Research

According to this study, investors should consider currency rates while making judgments. Even though they do not influence it, investors must have a deeper understanding of how the Malaysian economy is affected by exchange rate swings. Inflation in Malaysia is negatively correlated with the currency rate. Inflation rates decrease as exchange rates rise, and vice versa.

5.6 Conclusion

Examining the effects of particular independent factors on Malaysian inflation is the aim of this study. These comprise the money supply (MS), unemployment rate (UN), the GDP per capita (GDP), and the exchange rate (ER), which are four independent variables chosen using time series data. The research findings indicate a statistical association between inflation and the money supply (MS) and exchange rate (ER). While the money supply and inflation have a positive link, the exchange rate and inflation have a negative association. Future research may give priority to this study in order to give investors and policymakers greater understanding.

REFERENCES

Armesh, H., Salarzehi, H., Yaghoobi, N.M. & Heydari, A. (2010). Causes of Inflation in the Iranian Economy. International Review of Business Research, Vol. 6. No.3. pp. 30 - 44

Cheng, M. Y., & Tan, H. B. (2002). Inflation in Malaysia. International Journal of Social Economics, 29(5), 411-425.

Christensen, M. (2001), Real supply shocks and the monetary growth- inflation relationship. Economics Letters, 72(2001), 67-72.

Furuoka, F., & Munir, Q. (2014). Malaysian Journal of Business and Economics (MJBC). Unemployment and Inflation in Malaysia: Evidence from Error Correction Model, 1(1), 35–45. https://doi.org/10.51200/mjbe.v1i1.111

Hashim, M. J., Osman, I., & Elias, N. L. (2014). The determinants of inflation in Malaysia. In *3rd International Conference on Accounting, Business and Economics (ICABEC2014)*.

Hussain, S. (2011). Inflation and Economic Growth: Evidence from Pakistan. International Journal of Economics and Finance, 3(5), 262–276.

Islam, R., Abdul Ghani, A. B., Mahyudin, E., & Manickam, N. (2017). Determinants of Factors that Affecting Inflation in Malaysia. International Journal of Economics and Financial Issues, 7(2), 355–364.

Kasidi, F., & Mwakanemela, K. (2013). Impact of inflation on economic growth: A case study of Tanzania. Asian Journal of empirical research, 3(4), 363-380.

Khai, T. M. (2011). Determinants of inflation in Malaysia 1981-2010. *Master's research report. The graduate school of business, Universiti Sains Malaysia*.

Khan, A. A., Ahmed, Q. M., & Hyder, K. (2007). Determinants of recent inflation in Pakistan.

Liwan, A., & Lau, E. (2007). Managing growth: The role of export, inflation and investment in three ASEAN neighboring countries.

Madurapperuma, W. (2016). Impact of inflation on economic growth in Sri Lanka. *Journal of World Economic Research*, *5*(1), 1-7.

Mallik, G., & Chowdhury, A. (2001). Inflation and economic growth: evidence from four south Asian countries. Asia-Pacific Development Journal, 8(1), 123–135.

Mohd, W., Abdoh, Y. M., Hafizha, N., Yusuf, M., Azreen, S., Zulkifli, M., Bulot, N., & Ibrahim, J. (2016). Macroeconomic Factors That Influence Exchange Rate Fluctuation in ASEAN Countries. International Academic Research Journal of Social Science, 2(1), 89–94.

Monfared, S. S., & Akın, F. (2017). the Relationship Between Exchage Rates and Inflation: The Case of Iran. European Journal of Sustainable Development, 6(4), 329–340. https://doi.org/10.14207/ejsd.2017.v6n4p329

Munir, Q., & Mansur, K. (2009). Non-linearity between inflation rate and GDP growth in Malaysia. Economics Bulletin, 29(3), 1551–1565.

Munyeka, W. (2039). The Relationship Between Economic Growth and Inflation in the South African Economy. Mediterranean Journal of Social Sciences MCSER PublishingMPC); Stats South Africa; South African Reserve Bank (SARB, 5(15), 2039–9340.

Najihah, Y., Liya, F.N., Haida, K. M. K., Jamilyn, R. A. T. & Amir, I. Z. (2021). Factors that Influence the Inflation Rate in Malaysia. International Journal of Academic Research in Business and Social Sciences, http://dx.doi.org/10.6007/IJARBSS/v11-i9/10838 11(9), 626–637.

Naseri, M., & Zada, N. (2013). Effect of Inflation on Economic Growth: Evidence from Malaysia. International Centre for Education in Islamic Finance, April 2013, 14.

Ndiaye, N. D., & Masih, M. (2017). Is inflation targeting the proper monetary policy regime in a dual banking system? new evidence from ARDL bounds test (No. 79420). Munich Personal RePEc Archive (MPRA). https://mpra.ub.unimuenchen.de/79420/1/MPRA_paper_79420.pdf

Olatunji, B.O., Sawchuk, C.N., Moretz, M., David, B., Armstrong, T., Ciesielski, B. (2010), Factor structure and psychometric properties of the Injection Phobia Scale-Anxiety. Psychological Assessment, 22: 167-179.

Onyekachi, O. J., & Onyebuchi, E. M. (2016). An econometric analysis of the relationship between exchange rate depreciation and inflation in Nigeria. *International Journal of Economics, Commerce and Management*, *4*(9), 52-75.

Poon, W.C., & Tong, G.K. (2009). The feasibility of inflation targeting in Malaysia. Economics Bulletin, 29(2), 1035 -1045. https://www.researchgate.net/publication/46547235_The_feasibility_of_inflation_targeting_in_Malaysia

Rabiul, I., Ahmad, B.A.G., Emil, M. & Narmatha, M. (2017). Determinants of Factors that Affecting Inflation in Malaysia. International Journal of Economics and Financial Issues, 2017, 7(2), https://dergipark.org.tr/en/download/article- file/365806

Senthilnathan. (2019, July). *Usefulness of Correlation Analysis*. ResearchGate. Retrieved April 24, 2024, from https://www.researchgate.net/publication/334308527_Usefulness_of_Correlation_Analysis

Tai, J. J. (2017). *Effect Of Macroeconomic Variables Toward Inflation In Malaysia's Economy*.

Thaddeus, O. (2014). Exchange Rate, Inflation and Interest Rates Relationships: AnAutoregressive Distributed Lag Analysis Ebiringa, Oforegbunam Thaddeus 1 and Anyaogu, Nnneka, B. 2. Journal of Economics and Development Studies, 2(2), 263–279.

APPENDICES

Appendix 4.1: Description Analysis

	CPI	MS	UN	GDP	ER
Mean	4.527555	27.35161	1.211074	8.945752	4.593807
Median	4.530276	27.44833	1.193922	8.945755	4.583759
Maximum	4.845856	28.38940	1.526056	9.341316	4.827432
Minimum	4.129009	25.76042	0.875469	8.477344	4.407442
Std. Dev.	0.213605	0.779400	0.137081	0.245420	0.122874
Skewness	-0.204821	-0.382451	-0.010275	-0.013064	0.602227
Kurtosis	1.878753	1.962792	3.977339	1.920485	2.516767
Jarque-Bera	1.840625	2.145299	1.234335	1.506129	2.175453
Probability	0.398395	0.342101	0.539470	0.470921	0.336982
Sum	140.3542	847.9000	37.54330	277.3183	142.4080
Sum Sq. Dev.	1.368817	18.22394	0.563739	1.806923	0.452942
Observations	31	31	31	31	31

Appendix 4.2: Correlation Analysis

	CPI	MS	UN	GDP	ER
CPI	1	0.99514887...	0.19796293...	0.98614172...	-0.8815939...
MS	0.99514887...	1	0.16320539...	0.98026871...	-0.8655213...
UN	0.19796293...	0.16320539...	1	0.13774963...	-0.3752470...
GDP	0.98614172...	0.98026871...	0.13774963...	1	-0.8338140...
ER	-0.8815939...	-0.8655213...	-0.3752470...	-0.8338140...	1

Appendix 4.4: Granger Causality Test

Pairwise Granger Causality Tests
Date: 04/12/24 Time: 20:26
Sample: 1 31
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
ER1 does not Granger Cause CPI1	29	0.03754	0.8479
CPI1 does not Granger Cause ER1		0.00275	0.9585
GDP1 does not Granger Cause CPI1	29	0.20926	0.6511
CPI1 does not Granger Cause GDP1		0.22954	0.6359
MS1 does not Granger Cause CPI1	29	2.02431	0.1667
CPI1 does not Granger Cause MS1		1.82718	0.1881
UN1 does not Granger Cause CPI1	29	0.02636	0.8723
CPI1 does not Granger Cause UN1		0.44432	0.5109
GDP1 does not Granger Cause ER1	29	1.49895	0.2318
ER1 does not Granger Cause GDP1		0.04754	0.8291
MS1 does not Granger Cause ER1	29	0.70190	0.4098
ER1 does not Granger Cause MS1		0.60553	0.4435
UN1 does not Granger Cause ER1	29	0.29487	0.5917
ER1 does not Granger Cause UN1		0.65755	0.4248
MS1 does not Granger Cause GDP1	29	0.28202	0.5999
GDP1 does not Granger Cause MS1		0.09706	0.7579
UN1 does not Granger Cause GDP1	29	0.03738	0.8482
GDP1 does not Granger Cause UN1		0.07150	0.7913
UN1 does not Granger Cause MS1	29	1.84699	0.1858
MS1 does not Granger Cause UN1		2.38278	0.1348

Appendix 4.5: OLS Test (1st differences)

Dependent Variable: CPI1
Method: Least Squares
Date: 04/12/24 Time: 19:52
Sample (adjusted): 2 31
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ER1	-0.161059	0.056341	-2.858630	0.0085
GDP1	0.015680	0.124459	0.125987	0.9007
MS1	0.090564	0.051935	1.743786	0.0935
UN1	-0.045676	0.037693	-1.211769	0.2369
C	0.013396	0.005812	2.304725	0.0298

R-squared	0.314876	Mean dependent var	0.023895
Adjusted R-squared	0.205256	S.D. dependent var	0.013635
S.E. of regression	0.012156	Akaike info criterion	-5.831040
Sum squared resid	0.003694	Schwarz criterion	-5.597507
Log likelihood	92.46560	Hannan-Quinn criter.	-5.756331
F-statistic	2.872437	Durbin-Watson stat	2.063641
Prob(F-statistic)	0.043700		

Appendix 4.6: OLS Test (Original Data)

Dependent Variable: CPI
Method: Least Squares
Date: 04/12/24 Time: 19:21
Sample: 1 31
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ER	-0.130838	0.048520	-2.696560	0.0121
GDP	0.273967	0.054573	5.020211	0.0000
MS	0.169170	0.018983	8.911879	0.0000
UN	0.039922	0.021981	1.816216	0.0809
C	-1.997659	0.416695	-4.794059	0.0001

R-squared	0.996103	Mean dependent var	4.527555
Adjusted R-squared	0.995504	S.D. dependent var	0.213605
S.E. of regression	0.014323	Akaike info criterion	-5.507200
Sum squared resid	0.005334	Schwarz criterion	-5.275912
Log likelihood	90.36160	Hannan-Quinn criter.	-5.431806
F-statistic	1661.566	Durbin-Watson stat	1.029523
Prob(F-statistic)	0.000000		