



INTEREST RATE AND ITS IMPACT ON HOUSEHOLD SAVING IN  
MALAYSIA

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**“DECLARATION OF ORIGINAL WORKS”**

I, Amirah Najihah binti Khairun, (Matrix Number): 2016693566  
Hereby, declare that:

- This work has not previously been accepted in substance for any degree, locally or overseas, and is not being concurrently submitted for this degree or any other degrees.
- This project-paper is the result of my independent work and investigation, except where otherwise stated.
- All verbatim extracts have been distinguished by quotation marks and sources of my information have been specifically acknowledged.

Signature: \_\_\_\_\_ Date: 23<sup>TH</sup> DECEMBER 2019

## LETTER OF SUBMISSION

10 December 2019

The Head of Program,  
Bachelor of Business Administration (HONS.) Business Economics  
Faculty of Business Management  
Universiti Teknologi MARA  
Sabah

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Dear Madam,

### SUBMISSION OF PROJECT PAPER (ECO 672)

I am Amirah Najihah binti Khairun was required to do a project paper to complete my course ECO 672 for this semester. I hereby submit this project paper and I am truly trust that this paper will fulfil the necessity as required by the Bachelor of Business Administration (HONS.) Business Economics.

Thank you.

Sincerely,

---

AMIRAH NAJIHAH BINTI KHAIRUN

2016693566

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## LIST OF ABBREVIATION

|                |                             |
|----------------|-----------------------------|
| ADF            | : Augmented Dickey-Fuller   |
| CPI            | : Consumer Price Index      |
| R              | : Interest rate             |
| N              | : Unemployment Rate         |
| S              | : Saving rate               |
| Eviews         | : Econometric Views         |
| OLS            | : Ordinary Least Square     |
| PP             | : Philip-Perron             |
| VIF            | : Variance Inflation Factor |
| H              | : Hypothesis                |
| H <sub>0</sub> | : Null Hypthesis            |
| H <sub>1</sub> | : Alternative Hypothesis    |

## **ABSTRACT**

This paper examines the interest rate and its impact on the household savings in Malaysia. As we know, saving is needed for individuals and business organization which will automatically give an impact towards economic growth. Economic growth is important to develop our country. By doing this research we will also be able to understand how interest rate can give impact not only towards household saving, but also towards the economic growth. The time frame for the analysis is from year 1987 to 2018 with annual data observations. The model is tested using time-series and regression methods on dependent and independent variables. The dependent variable used in this research is household saving rate, while independent variables are interest rate, Consumer Price Index (CPI) and unemployment rate. This research not only highlights how interest rate gives an impact to household saving, but it also involves other factors that can give an impact to household saving such as Consumer Price Index (CPI) and unemployment rate. The result indicates that Consumer Price Index and interest rate do influence the saving while the unemployment rate does not influence the saving.

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Interest rate is the amount of interest payment that can be received by savers on their deposits. The changes in interest rate can give a different effect on household saving. In order to determine the impact of interest rate on household saving, it is important to identify what factor that can influence the household's saving. This research is to study on how interest rate give an impact to the household saving by using the empirical studies. So the main hypothesis in this research is to testing whether or not there is a maximum interest rate that can increase the saving in the Malaysia. The variables that will be explain is Saving, Consumer Price Index (CPI), Interest rate and Unemployment rate.

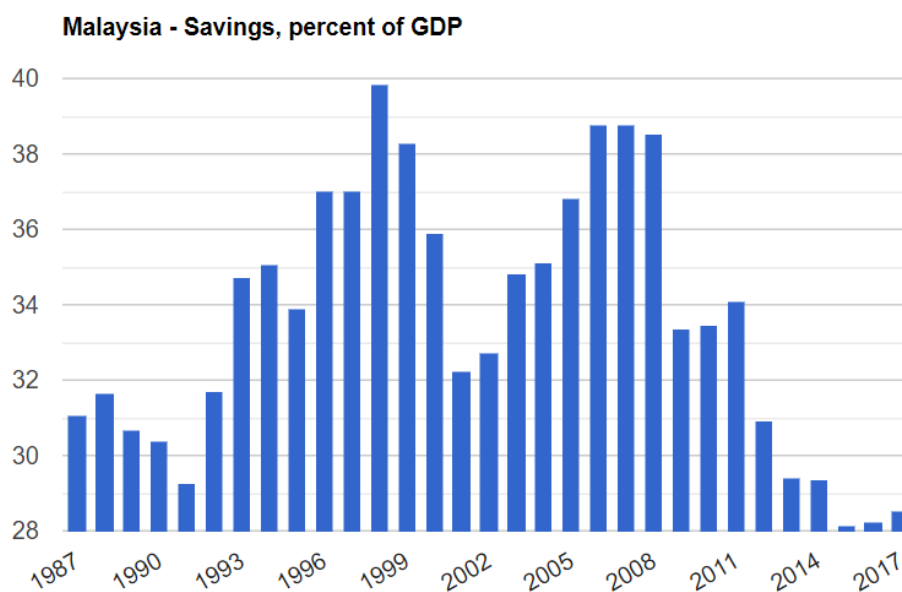
#### 1.1.1 Saving in Malaysia

Saving is important for business organization and individual. For Malaysia developing country, saving is important for the economic growth and development. Based on Harrold (1939) and Domar (1946) the ability to save can speed up the economic growth due to the high saving rate can increase the rate of investment and automatically generate the economic growth.

Historically, if the interest rate is low, so it will cause the increase in consumption level, however, is there any point that can become detrimental to society if they lowering the interest rate? They are many opinions said that when the interest rate become too low, bank do not have enough motivation to take part in lending results will even lower the consumption levels.

### 1.1.2 Household Saving

Based on the definition of household saving, it is a difference between a household's disposable income (such as wages, income of the self-employed and net property income) and also its consumption levels (expenditures on services and goods). The household saving rate can be get by dividing the household savings with disposable income of a household. Savings also can be said as an excess of resources that are available in economy that assist to the development and growth process (Yong, Teh, Ooi and Siah (2008)). Besides that, when negative savings rate happens, that means the household were spends more than it receives as regular income and finances some of the expenditure either by gains arising from the sale of assets (financial or non-financial) or through incurring debt or by running down savings which have been accumulated in the past.



**Figure 1.0 Gross Saving rate in Malaysia**

(1987-2017)

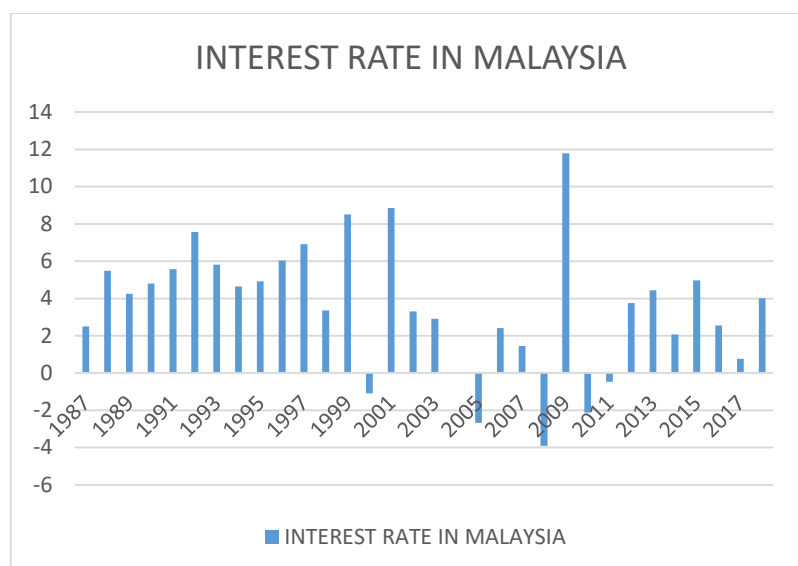
Source from theGlobalEconomy.com

Figure above shows that Malaysia has facing fall in saving in year 2015 with gross saving rate at 28.16% of GDP. Based on the BNM annual report in 2015, this happened due to the inflationary pressures are weakened, weighed down mainly by lower energy prices. Besides that, during the year, episodes of near-zero or negative headline inflation has been experiences by several major economies. Core inflation rates, that exclude energy prices and food, amid moderate demand, remained relatively subdued and wage growth. However, in year 1998 has the highest saving rate in Malaysia, based on the clutejournals.com, this is happened due to the Malaysia has a high economic growth, the GDP contracted sharply by 6.7 per cent in 1998. Malaysia's saving and investment were significantly strong this is due to the macroeconomic stability leading to relatively low rates of inflation and political stability.

### **1.1.3 Factors that Influence Saving**

#### **i. Interest Rate**

Interest rate can be defined as the amount of interest payment that savers will receive on their deposits. Saving will become more attractive when has an increase in interest rates and it should encourage interest rates. However, when the interest rate has been cut, it will cause reduce in reward of saving and it also can discourage saving as well. Moreover, it will become more complicated in real world because there are many factor that can effect saving rates. Giovannini(1983), Ozcan(2000) Mackinnon(1991) and Boskin(1978) agreed that the elasticity of the saving for interest rate is low.



**Figure 1.1 Interest rate in Malaysia**

(1987-2018)

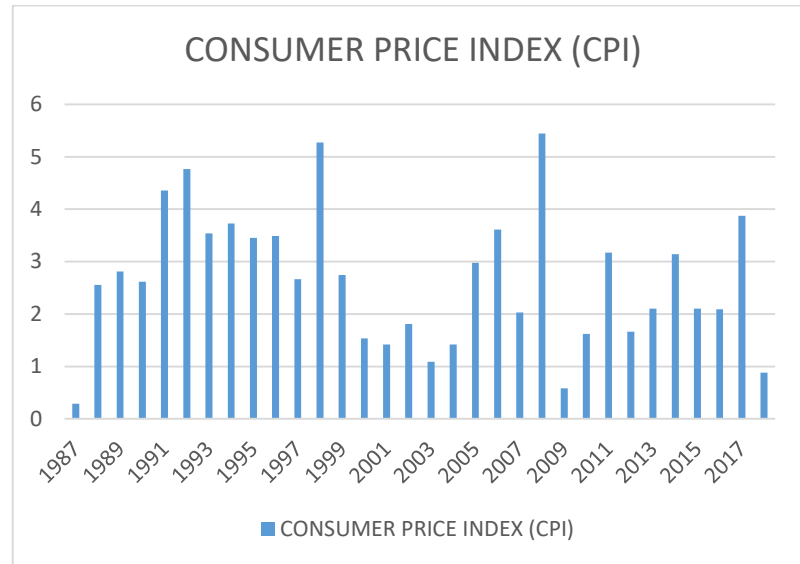
Source from World Bank

Figure above shows the interest rate in Malaysia. In year 2008 has the lowest percentage of interest rate which is -3.90, this is due to the financial crisis that happen in year 2008 t cause the interest rate fall to the lowest rate or it can be called as global economic downturn. However, the higher interest rate is in year 2009, where the interest rate growth faster to 11.78%. in the beginning of the first quarter of 2009, the domestic economy has faced the full impact in global recession. The measure taken by Bank Negara Malaysia (BNM), though the fiscal stimulus measures was implement and supported by the monetary policy and introduction of the comprehensive measures to sustain the financing and reduce any impact of the high risk aversion among banks that can contributed to stability of the domestic economy.

ii. Consumer Price Index

CPI were examining the average change overtime in the prices for a market basket of consumer goods and services that were paid by urban consumer such as food, medical care and transportation. Market basket is a retail prices monthly change of around 80,000 for a specific goods and services. It was calculated by taking price changes for each item in the predetermined basket of goods and averaging them. To assess price changes associated the changes in the CPI were used with the cost of living, the CPI also are frequently being used for identifying the periods of deflation or inflation.

Abdul Rani and Zulkhibri (2016) used the annual growth of CPI as an indicator of inflation.



**Figure 1.2 Consumer Price Index (CPI)**

(1987-2018)

Source from World Bank

Based on the diagram above, the graph shows in year 1987 has the lowest CPI with 0.29%.

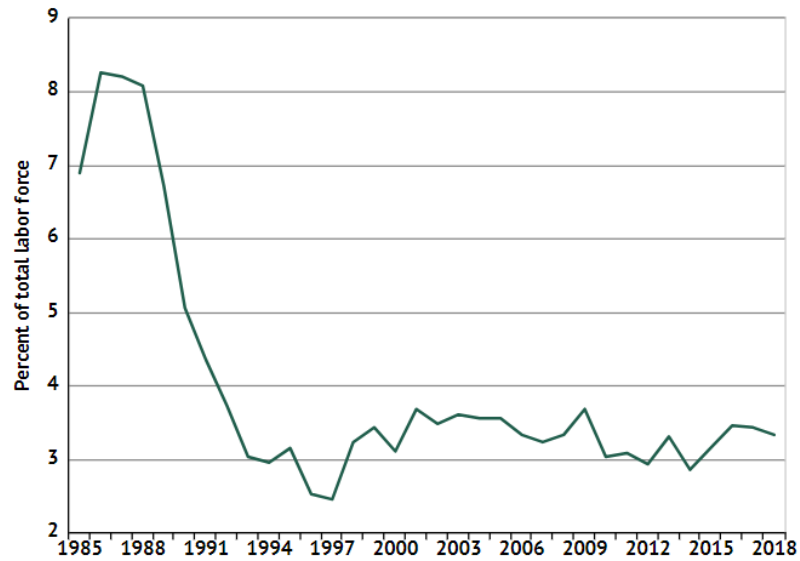
This happened due to the inflation rate in Malaysia was decelerated, in concert with world inflation. However, for three consecutive years registered less than 1 per cent rates of growth in CPI, from year 1985 to 1987. However, Malaysia has highest CPI in year 2008 with 5.44%. This is because of the inflationary pressure that has being face by the country.

### iii. Unemployment Rate

The one of the most important economic problems that create pressure on the emerging markets is the unemployment rate. Thus, the deceleration of economic growth in a most of the developing countries is the main source of the increase in unemployment rates.



### What is Malaysia unemployment rate?



**Figure 1.3 Unemployment Rate**

(1985-2018)

Source from knoema.com

Based on the graph above, in year 1985, the unemployment rate kept rising until it reached its peak of 8.21 per cent in 1987. Reverse trend was in evidence starting from 1988. The unemployment rate was shrinking due to the economic boom in the country and in year 1997 state the amount to 2.44 per cent. Start from 1998 to 2009, the unemployment rate in Malaysia kept constant at level 3.5 per cent.

## 1.2 Problem Statement

According to Keynesian economics, savings is a balance from a person when the cost of consumer expenditure were subtracted from the amount of disposable income earned from the given period of time. However, it can be positive when the amount of money that has left after the expenses that have been made from the person who is a financially prudent. For the person who want to rely on loans and credit to make the ends meet, conclude that there is no more money left for their saving. To increase the income, saving can be used by investing.

This research shows how the interest rate give an impact to the household saving. In this topic, when people want to choose their current saving, they just not have to consider their current income and desires, but also need to focus on their future income and desires as well.

Saving is the activity that are important for business organization and individual. For developing country such as Malaysia, savings can also be said as a catalyst for the development and economic growth. Malaysia has experienced varying progress and changes on economic condition since 30 years ago. However, the country that consist of high savings rate was has negative impact of the financial crisis in 1997. There are many factor that cause the financial crisis happen in Malaysia, in this research were only focus on one factor which is due to the fall in Malaysia currency. Because of that people less invest in the Malaysia bank, automatically the investment fall and the economic growth also fall. Technically, saving were encourages investment set off further growth of the economy of the country. However, to overcome this problem, government increase the interest rate and automatically it increase the saving in Malaysia and the investment also increase. According to Domar (1946) and Harrod (1939) the ability to save by its people were characterized the speed of the economic growth due to the high savings rate, and it will increase the rate of investment and consequently the economic growth will be stimulate.

Besides that, it shown most people are forward looking than use the life cycle model, in their saving, they also worry their children as well rather than themselves. These people usually not only to finance for their own selves but they also need to give finance

for their children. However, there are other people forward looking as life cycle model, but they save their money to achieve a given level of consumption in future.

### **1.3 Research Question**

1. Is there any significant relationship between interest rate, CPI and Unemployment rate with saving in Malaysia?
2. How interest rate, CPI and Unemployment rate can encourage savings in Malaysia?

### **1.4 Research Objective**

1. To justify whether there is a significant relationship between interest rate, CPI and Unemployment rate with saving in Malaysia.
2. To investigate how interest rate, CPI and Unemployment rate can encourage savings in Malaysia

### **1.5 Scope of Studies**

This research to analysed how the interest rate can give an impact to the household saving and how this can influence to our economic growth. Interest rate become an issue, not only in Malaysia but it is also around the world. By doing this research, the researcher can know how the interest rate give an impact to the household saving.

In this study, researcher using the secondary data to gain the information about the consumption and saving behaviour and literature review was founded from internet materials such as articles and journal that need to support all the dependent and independent variable to do this research.

This research is more focus on Consumer Price Index (CPI), unemployment, rate interest rate, and saving in Malaysia.

## **1.6 Limitation of Study**

There are some of limitation that the researcher studies:

i) Time constraints

For a researcher, they have a limited time to do this study because it is cover the entire Malaysia and need more additional time.

ii) Data collection

Since this study use secondary data. Researcher gain the data from the BNM and other resources in the internet to do this research.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

In this chapter, researcher will discuss some previous studies that has be done by the other researcher that will support each of relationship of each independent variable for this study that related with this paper. The previous studies are related with this research which is interest rate and its impact on household savings.

#### **2.1 Literature review**

Theoretically, interest rate, CPI and unemployment rate are concerned to the household saving. These relations have been investigating by many researchers. However, the results are varying. However, different of the sample period involved in the analysis and a change in the selected estimation can be said the main reasons for the different empirical results obtained. There are some of the article that has being mention in literature review to show the differentiation of the sample period involved in the analysis and a change in the selected estimation.

The first article is by Christensen (2012) in United States point out that saving was highly correlated to GDP. However, Consumer Price Index (CPI) has the most negative correlated with saving and it cause the inflation increase, saving decrease. CPI, disposable income and GDP are both significantly adversely related with saving. Other negative correlated variables are sentiment.

The next study of Jongwanich (2010) determinants of the household savings in Thailand. For examine a broad set of macroeconomic factors, author has construct error correction model. He found that inflation, economic growth and terms of trade positively affected savings. Furthermore, on the corporate savings and contrary public, elderly and young dependencies as well as availability of credit has decreased the household savings in Thailand. Likewise, Abbas, et al. (2010) with the help of error correction methodology to investigated determinants of national savings of Pakistan. They found that in long run consumer price index, public loans, exports, interest rate,

workers remittances and government spending become a significant factors in determining the savings.

Besides that, Persson (2016) stated that the interest rate has the positive effect to saving rate which mean that the increase in real interest rate can increase the household saving rate. However, for the other variable such as inflation, it state that it has a positive impact on saving rate, meaning that when the inflation or CPI increase, household would increase their saving rate. This can be said that, the country with higher inflation also saves more money which can be considered a necessity since their money is becoming worth less.

Klaus Schmidt-Hebbel, Norman Loayza and Luis Serven (2000) stated that the Inflation has positive effect to the saving. They find that reduction in inflation can cause decreasing in saving, this is because people tend to save their money for their precautionary motives.

Next, this is further supported by the next article from Dasmin Bin Hashim<sup>1</sup>, Fauzi Bin Pin<sup>1</sup> and Mohd Yaziz Bin Mohd Isa (2017). This article stated that, positive relationship happens between saving and interest rate. Consumer Price Index (CPI), has a positive relationship with savings rate, but lower than interest rate factor because people have been affected by the increasing in price of the consumer goods and services over the specific time measured.

Raberto, Manuael and Dolores (2014) found that the unemployment rate has a positive relationship with saving. It can be said an increase in saving rate will make the unemployment rate increase, this happen because consumption has fall, at the same time, the restructuring of the banking sector has cut credit to the private sector.

This is also can be proved by researcher Ashoka Mody, Damiano Sandri, Franziska Ohnsorge found that increase in unemployment can cause the consumption function down, to accumulate more precautionary savings the agent cuts the consumption. The impulse response function on the right side shows indeed that the saving rate increases in response to higher unemployment.

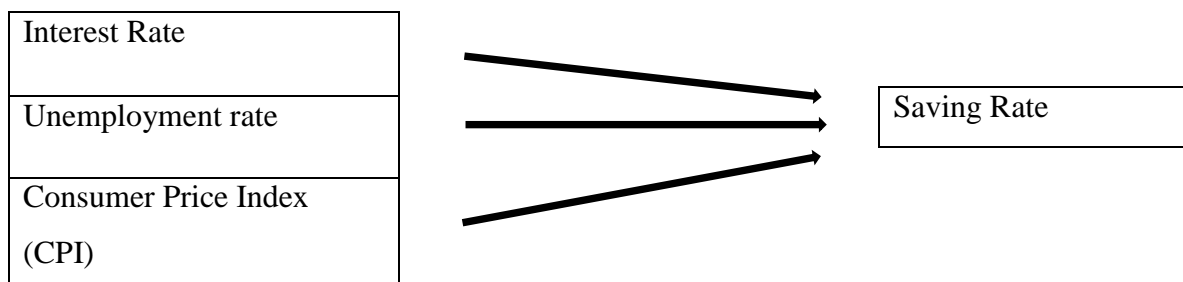
Other than that, Joshua Aizenman, Yin-Wong Cheung and Hiro (2016) It has found that in their journal the interest rate has negative relationship with saving. It happened due to the extremely high levels of output volatility and also due to the well-developed

financial markets. When the real interest rate at a lower rate, the greater output volatility would cause the higher private saving in developing countries. However, the policies of the low interest rate was adopted by advance countries to encourage their economies can cause contractionary effects on the developing countries by encourage the saving.

Further, Narayan (2006) to investigate factors that influencing the savings rate in Fiji by using estimated error correction model. She conclude that in the short run real interest rate and growth rate had positive impact on saving, while negative effect for the current account deficit. In the long run saving rate in Fiji was positively affected by growth rate, whereas current account and had a negative influence for the real interest rate deficit. Alike, Egwaikhide and Nwanchukwu (2007) deal with determinants of private saving in Nigeria using error correction model. They recommend that the external terms of trade, income, external debt service ratio, inflation and public saving increased private saving. Otherwise, in contrast interest rate as well as growth of income reduced Nigerian private saving.

## 2.2 Theoretical Framework

To conduct this research is by using a specific model that can be defined as independent variable and dependent variable that were used during this research. The dependent variable can be defining as the variable of primary interest to the researcher. While independent variable can be defined as the thing that influence the dependent variable whether in positive or negative way. The model is used as follow: determining the interest rate and its impact on the household consumption and savings in country.



**Figure 2 : The Theoretical Framework Diagram**

### Hypothesis 1

$H_0$ : Interest rate and household saving in Malaysia are not related each other. (Not significant)

$H_1$ : Interest rate and household saving in Malaysia are related each other. (Significant)

### Hypothesis 2

$H_0$ : Consumer Price Index (CPI) and household saving in Malaysia are not related each other. (Not significant)

$H_1$ : Consumer Price Index (CPI) and household saving in Malaysia are related each other. (Significant)

### Hypothesis 3

$H_0$ : Unemployment Rate and household saving in Malaysia are not related each other. (Not significant)

$H_1$ : Unemployment Rate and household saving in Malaysia are related each other. (Significant)



## CHAPTER 3

### DATA AND METHODOLOGY

#### 3.0 Introduction

This chapter will discuss on data and methodology that has being used in this study. This chapter present the research methodology that was used to study the interest rate and its impact on household savings. It also gives the data collection techniques and how data was analysed. It also talks about the data analytical model and test of significance used in arriving at the conclusion. Based on the conceptual framework and arguments in the literature review, it can be said that the most researchers have their own opinion. This study was based on the secondary data, which is, it taken from the world bank data. In our study interest rate, consumer price index (CPI) and unemployment is our independent variable while saving is our dependent variable. This study was based on the upon model design.

#### 3.1 Data Description

The data for all variables are collected from year 1987 to 2018, which means it has 31 observations. The summary for the data sources for all variable are shown below:

**Table 1.0 : The Summary of Data Sources and Variables**

| Variables            | Proxy | Unit Measurement     | Data Sources         |
|----------------------|-------|----------------------|----------------------|
| Saving               | S     | % of GDP             | theGlobalEconomy.com |
| Interest Rate        | R     | % of GDP             | Data WorldBank       |
| Consumer Price Index | CPI   | Annual %             | Data WorldBank       |
| Unemployment Rate    | N     | % total labor forces | knoema.com           |

### **3.2 Sources of Data**

The sources of data were getting from the World Bank website, the global economy website and knoema website

### **3.3 Sample size**

In this study, it used 32 observations for the dependent and independent data set from year 1987-2018.

### **3.4 Secondary Data**

Secondary data is the data that has been collected by someone from who is someone other than the user. Common sources of secondary data for social science include information collected by government departments, censuses, organizational records and data that was originally collected for other research purposes.

### **3.5 Sampling Design**

#### **3.5.1 Sampling Techniques**

Importantly, those data must be accurate, suitable and complete for the further analysis. Researcher has to rearrange and record the data and then apply some various descriptive and inferential statistics or econometrics concepts to explain the data and draw inferences (Fareed, 2016). The data collected was analysed using E-views which is a general-purpose statistical software package to find the relationship between the interest rate and savings. Before regression, we need to evaluate the descriptive analysis for help us to know the behaviour of variable through the E-views statistic software.

### 3.5.2 Method to Be Considered

A regression model was applied to identify the effects of each of the variables with respect to the interest rate, CPI and unemployment rate. Regression is for explain the movements in a variable by refer to the movement in one or more other variables. According Wagner (2007), in predicting the value of dependent variable, regression models can be used in an explanatory study where the researcher is interested based on the value of independent variable. This study was based on the model design below:

#### 3.5.2.1 Multiple Regression Model

##### Model 1

The model given below was given in theoretical and conceptual form to identify the impact of Interest rate, unemployment rate and Consumer Price Index on Savings rate in Malaysia.

Savings rate =  $f$  (interest rate + CPI + unemployment rate)

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \mu$$

Where;

Y= Savings rate in Malaysia

a= intercept

$X_1$ = interest rate

$X_2$ = CPI (consumer price index)

$X_3$ = Unemployment Rate

$\mu$ = error term

#### 3.5.2.2 Unit Root test

When comes in practice, the selection of the most appropriate unit root test become very difficult. To enhance the robustness of the selected variables interest rate, unemployment rate and Consumer Price Index (CPI), there are several unit root tests exists, such as Augmented Dickey Fuller test and Philips Peron. Enders (1995) recommended to use both of the unit root tests such as the Philips–Perron (PP) test (1988) and the augmented Dickey Fuller tests (1981). In Dickey Fuller test assumed

that the error term is uncorrelated. While in time series data the serial correlation problem may come. To eliminated this problem, Dickey and Fuller again presented ADF test of unit root with the assumption of error term is correlated (serial correlation). They add the lag of regress and on right side of the equation in their previous (DF) unit root test to recover the problem of serial correlation. The PP unit root test was used to check and verified the results of ADF unit root test.

#### 3.5.2.3 Ordinary Least Square (OLS) Test

Ordinary least square (OLS) is a linear regression function. When OLS is used, the point is to minimize the sum of squares of the observed and predicted values. By squaring the residuals like the OLS method does, more attention is given to residuals with a longer distance to the fitted line (sample regression function) and the point is to find the tightest fitted line to the observed data (Gujarati & Porter 2009). There are seven assumptions behind the method of ordinary least square, if one of these assumptions are violated, the outcome and result from the regression is risked being biased and the results can not be reliable (Gujarati & Porter 2009)

#### 3.5.2.4 Heteroscedasticity Test

The Autoregressive Conditional Heteroscedasticity (ARCH) model is applied to identify whether error variance may violate classical properties and whether better parameter estimates and statistical outcomes may be obtained. Different ARCH or GARCH processes are chosen for three different variables based on the significant coefficients.

#### 3.5.2.5 The Multicollinearity test

This test is to check whether the model have linear or non-linear relationship, we use multicollinearity test. If the result is have non-linear relationship, therefore there is problem between the variables. This test will be assessed by looking at the mean VIF or centered VIF. If the mean VIF and centered VIF result is greater than 10, therefore there is multicollinearity problem in the model. Otherwise, there is no multicollinearity problem in the model.

### 3.5.2.6 Solution serial correlation of LM test (Newey-west HAC standard errors)

Hypothesis:

$H_0$  : no autocorrelation among the error terms

$H_1$  : autocorrelation among the error terms

Decision rule:

Reject  $H_0$  if p-value of F-test statistic is less than significant level 5%. Otherwise, do not reject  $H_0$ .

Conclusion:

At the significant level of 5% the autocorrelation problem may be exist in the model. So, this study will conduct the Autoregressive Distributed Lag Model (ARDL) to make sure that the autocorrelation problems can be solved. The autocorrelation model will have conducted in the next section.

### 3.5.2.7 Ramsey RESET test

The Ramsey RESET test is used to identify the specification of the regression. It was done with the addition of one fitted term. The null hypothesis is that the original model is correct, and given that the F statistic derived is insignificant, the null hypothesis is not rejected. This indicates that the model is correctly specified.

### 3.5.2.8 Normality test

A normality test is conducted by using Jarque-Bera statistic on a histogram normality test. However, the null hypothesis is the errors of the constructed regression are normally distributed. When residuals are normally distributed, the Jarque-Bera statistic become insignificant.

## CHAPTER 4

### RESULTS AND FINDING

#### 4.1 INTRODUCTION

This chapter will discuss on the result that had been obtain from the models as mention in chapter three. The result is being generated through e-views 10 software and simplified in a form of table for a better and clear understanding. I will be using fourth test to proof the relationship of the impact and also the significant of each of the factors using multiple regression test, Augmented Dickey Fuller (ADF), Phillips Perron test, Ordinary Least Square (OLS) test, Heteroscedasticity test, Multicollinearity test, Breush Godfrey Serial Correlation LM test, Model Specification Test and Normality test.

#### 4.2 RESULTS

##### 4.2.1 Statistical Analysis

##### 4.2.1.1 Multiple Regression model

Table 2.0 : Descriptive Statistic

|              | S         | R         | N        | CPI      |
|--------------|-----------|-----------|----------|----------|
| Mean         | 33.28688  | 3.542326  | 3.750969 | 2.651471 |
| Median       | 33.41500  | 3.878555  | 3.342500 | 2.640158 |
| Maximum      | 39.85000  | 11.78227  | 8.207000 | 5.440782 |
| Minimum      | 25.15000  | -3.903257 | 2.445000 | 0.290008 |
| Std. Dev.    | 3.745610  | 3.453668  | 1.379539 | 1.296655 |
| Skewness     | -0.059024 | -0.072140 | 2.370200 | 0.304459 |
| Kurtosis     | 2.170451  | 3.056138  | 7.661363 | 2.549108 |
|              |           |           |          |          |
| Jarque-Bera  | 0.936115  | 0.031958  | 58.93293 | 0.765446 |
| Probability  | 0.626218  | 0.984148  | 0.000000 | 0.682002 |
|              |           |           |          |          |
| Observations | 32        | 32        | 32       | 32       |

Table 2 shows that 32 observations were analyse and found the all variables are positive in mean which are the interest rate 3.542326, unemployment rate 3.750969 and CPI

2.651471. Saving is the higher maximum value and standard deviation which is 33.28688 and 3.745610 and CPI has lowest minimum value of means and standard deviation with 2.651471 for mean and 1.296655 for standard deviation. The result indicates that the sample of Malaysia has experience an average saving rate of 33.29% within the studied time span of 32 years. For the skewness, it measure the asymmetry of probability distribution, based on the table above, saving and interest rate has negative sign which means it skewed to the left while for the CPI and unemployment rate it has positive sign which means it skewed to the right. Only saving and CPI has a kurtosis less than 3 with means it is has flat distribution, while for the interest rate and unemployment, it has value more than 3 which means it has peak distribution. However, for the p-value of Jarque-Bera shows that only saving, interest rate and CPI has value more than 5% in p-value.

#### 4.2.1.2 Augmented Dickey Fuller (ADF) test

Table 3.0 : ADF test

| <b>Variable</b> |              | <b>ADF</b>            |
|-----------------|--------------|-----------------------|
| <b>S</b>        | Level<br>d=1 | (0.9197)<br>(0.0000)* |
| <b>R</b>        | Level        | (0.0000)*             |
| <b>N</b>        | Level        | (0.0188)**            |
| <b>CPI</b>      | Level        | (0.0005)*             |

Note: Figure in parentheses indicate number of lag structures

\*\* indicates significance at the 5% level

\* indicates significance at the 1% level

$H_0$  : Test stated that there is unit root in time-series

$H_1$  : Test stated that there is no unit root in time-series

In first step shows that they use ADF root test to examine the stationarity of the variables and the results from the ADF test are shown in table 1. The empirical value for ADF test statistics for level values shows that saving has probability value higher than 0.05. Therefore, the null hypothesis cannot be rejected. That means, with 95% confidence probability level values of saving are not stationary. But for other variable were reject the null hypothesis of the presence of a unit root due to the probability values are lower than 0.05, the null hypothesis can be rejected with 95% confidence probability. However, the ADF test of differenced values of saving reject the null hypothesis due to the probability is lower than 0.05. Thus, there is no unit root in first differences of saving.

To summing up the results, found that the time series of the saving are non-stationary at it level. However, the first differences are stationary, which means that saving are the first order of integration. For the other variable such as interest rate, unemployment rate and consumer price index are stationary at the time series at their level.

#### 4.2.1.3 Ordinary Least Square (OLS) Test

Table 4.0 Ordinary Least Square (OLS) Outcome

| Variable | Coefficient | Std. Error | t-Statistic | Prob.      |
|----------|-------------|------------|-------------|------------|
| R        | -0.121933   | 0.057182   | -2.132340   | (0.0422)** |
| N        | 0.000457    | 0.262960   | 0.001737    | (0.9986)   |
| CPI      | 0.803380    | 0.243129   | 3.304335    | (0.0027)*  |
| C        | -2.377387   | 1.197343   | -1.985552   | (0.0573)   |
| $R^2$    | 0.8010      |            |             |            |

Notes: Figure in parentheses indicate number of lag structures

\* indicates significance at the 1% level

\*\* indicates significance at the 5% level

$$\text{Saving} = -2.377387 - 0.121933 R + 0.000457 N + 0.803380 \text{ CPI}$$

Table above explain the relationship between saving and other variables (Interest rate, unemployment rate and CPI). Significant was happened when the probability is less



than 0.05 ( $p < 0.05$ ). Table above shows that interest rate and CPI has the significant variable, while only unemployment rate are not significant variables. Based on the equation above CPI has the positive effect on saving rate which means it against the economic theory but this can be supported by Person (2016) and Luis Serven, et al. (2000) stated that CPI has a positive impact on saving rate because when inflation was happen people will save their money and it became necessity since their money is becoming worth less. Besides that, unemployment rate also has a positive relationship with saving which means its follow the economic theory. This can be supported by Raberto (2014) and Ashoka (2012), they said when the unemployment rate increase, it will cause the consumption function decrease to accumulate more precautionary saving. Furthermore, interest rate has negative effect on saving rate means that it was against the economic theory. This finding were supported by Joshua(2016) and Egwaikhide (2007) which is interest rate has a negative relationship with saving due to the well-developed financial markets which means when interest rate increase people will decrease their saving because they will more invest their money on financial market such as bond and stock. The equation above shows that the parameter -2.377387 indicates the predicted consumption when all explanatory variable are equal to zero. For the interest rate it shown that for each unit increase in interest rate, saving goes down by 0.121933 units. When there in an increase for each unit of the unemployment rate, saving goes up by 0.000457 units. Besides that, when CPI increase for each unit, the saving rate will goes up to 0.803380 units. Lastly, for the  $R^2$  it has 0.8010 which means the more the value of the  $R^2$  the better the model fit the data.

#### 4.2.1.4 Heteroscedasticity Test

Table 5.0: Autoregressive Conditional Heteroscedasticity (ARCH)

|               |          |                     |        |
|---------------|----------|---------------------|--------|
| F-statistic   | 0.643375 | Prob. F(2,26)       | 0.5337 |
| Obs*R-squared | 1.367541 | Prob. Chi-Square(2) | 0.5047 |

Table above shows the Heteroskedasticity Autoregressive Conditional Heteroscedasticity (ARCH).

$H_0$  : No heteroscedasticity (presence of homoscedasticity)

$H_1$  : Presence of heteroscedasticity (absence of homoscedasticity)

Table 5.0 shows the Chi-square of the ARCH test is 0.5047 which is it is substantially more than 0.05, which means the all variables has no auto correlation. It show that there is no autocorrelation problem between the error terms in the model at the significant level of 5% if proven with sufficient evidence. We can say that this model is free of econometrics problems. Consequently, the residuals of model are homoskedastistic with confident probability of 95%. The variance of residuals of model under consideration is constant.

#### 4.2.1.5 Multicollinearity Test – Variance Inflation Factors

Table 6.0 : Variance Inflation Factors

| <b>Variable</b> | <b>Centered VIF</b> |
|-----------------|---------------------|
| <b>CPI</b>      | 1.041937            |
| <b>N</b>        | 1.012109            |
| <b>R</b>        | 1.053620            |
| <b>C</b>        | NA                  |
| <b>MEAN VIF</b> | 1.035889            |

$H_0$  : The residuals does not have multicollinearity

$H_1$  : The residuals have multicollinearity

Table 6.0 shows that the data does not suffer multicollinearity which means there is no problem in evaluating the significance for each independent variables. As we can see, the mean VIF is less than 10. Based on the result, the mean VIF or centered VIF value is not more than 10 (1.035889), thus this will indicate there is no multicollinearity problem.

#### 4.2.1.6 Breusch Godfrey Serial Correlation LM Test

Table 7.0 : Breusch Godfrey Serial Correlation LM Test

|               |          |                     |        |
|---------------|----------|---------------------|--------|
| F-statistic   | 1.238026 | Prob. F(2,25)       | 0.3071 |
| Obs*R-squared | 2.793619 | Prob. Chi-Square(2) | 0.2474 |

$H_0$  : Absence of serial correlation

$H_1$  : Presence of serial correlation

Table 7.0 shows the Breusch Godfrey Serial Correlation LM Test. Null hypothesis in this test stated that there is not any serial correlation to a certain lag, in our case till sixth lag. F-statistic is 1.238026 and its probability value is 0.3071. As the  $0.3071 > 0.05$  the null hypothesis cannot be rejected. Hence there is not any serial correlation in residuals of model till sixth lag with confidence probability 95%.

#### 4.2.1.7 Model Specification Test

Table 8.0 : Ramsey RESET Test

|                  | Value    | df      | Probability |
|------------------|----------|---------|-------------|
| F-statistic      | 2.257765 | (2, 25) | 0.1255      |
| Likelihood ratio | 5.147263 | 2       | 0.0763      |

$H_0$ : Functional form is correct specified

$H_1$ : Functional form is incorrect specified

Table 8.0 shows the result for the Ramsey Reset Test. The p-value of the Ramsey Reset Test has been noted to be 0.1255 which means it was significantly higher than 0.01 (significance at 1%), so the null hypothesis were accepted which means there is no positive auto correlation. Thus, the null hypothesis can be accepted in this case, which proves that chosen specification form of model is correct with confidence probability of 95%.

#### 4.2.1.8 Normality Test

Table 9.0 : Jarque-Bera Test

|                    |          |
|--------------------|----------|
| <b>Jarque-Bera</b> | 0.661301 |
| <b>Probability</b> | 0.718456 |

$H_0$  : The residuals are not normally distributed

$H_1$  : The residuals are normally distributed

Table 9.0 shows the result for the normality test. It states that the Jarque-Bera statistic is 0.661301 and its probability value is 0.718456, which is higher than 0.05, which means, the null hypothesis were rejected. The residual are normally distributed. The normality of residuals shows that the residuals are stationary.

## **CHAPTER 5**

### **CONCLUSION AND RECOMMENDATION**

#### **5.1 INTRODUCTION**

This chapter discuss about the finding from the research that are already studied. There have two section in this chapter which are the conclusion and recommendation. In the conclusion sections, it discuss on the summary of each chapter for the overall research. After that, there will be an explanation on the recommendation which is can be very useful to the future research.

#### **5.2 CONCLUSION**

This study was analysed the impact of interest rate on household saving in Malaysia. Time series data is used over the period 1987 until 2018 to estimate the results. This study was using descriptive analysis, regression analysis, unit root test, Ordinary Least Square (OLS) Test, Heteroscedasticity Test, The Multicollinearity test, Solution serial correlation of LM test (Newey-west HAC standard errors), Ramsey RESET test and Normality test to find the impact between independent and dependent variable selected in this study. With the help of Ordinary Least Square (OLS) Test, the results shows that the independent variables give an different effects towards the saving rate in Malaysia. It shows a positive relationship were exist for the consumer price index and unemployment rate, but negative relationship with interest rate. Besides that, economic condition is the one of the other condition that might determine the saving rate in Malaysia. In a good economic condition, people will increase their saving but they will reduce their savings when economy become worsen and expenses become higher.

However, in this method also shows that interest rate and consumer price index (CPI) has a significant variable that can influence household saving in Malaysia but for the unemployment rate, it not significant which means it does not influence household saving in Malaysia. Moreover, it was proved that levels of such variables such as

interest rate, unemployment rate and CPI had unit root at their time series, but for the saving, it has unit root at first order of integration.

Besides that, in this study the adequacy of the estimated model also being tested by using Heteroscedasticity Test, The Multicollinearity test, Solution serial correlation of LM test (Newey-west HAC standard errors), Ramsey RESET test and Normality test. The results shows that most of the test are accept their null hypothesis but for the Normality test, it reject the null hypothesis.

### **5.3 RECOMMENDATION**

Based on the results above, I would like to recommend to other researcher as they carry out this research paper in the future to using more tests in order to give us the much accurate results and the results can give the affective conclusion and recommendation.

For the using for the future studies, researcher must make an in-depth and extended analysis on the interest rate give an impact to the household consumption and saving. To make sure the validity data, the researcher should take the primary data from the authorize parties to compare and rely on the secondary data from Data stream because we cannot know whether the data is correct or not when they are updating.

For further studies, we can make this research as a references. As an alternative of choosing the smaller sample, it is much better to have much bigger sample data. Researcher also recommended to use 5% significant level to get most accurate variable data. 5% means that the finding has a 95% chance of being true, instead of 90% when using 10% significant level. Try it with several of data of one variable. Hence, to gain a better result in future, the researcher needs to have more period of the study sample.

Based on our study, we suggest the CPI would give a positive responsively in saving and people tend to saving more. However, saving give a negatively respond to the interest rate in Malaysia. So, to increase the national saving, policies should have been made. With the effective monetary policies could be helpful and the government need to attract and educate people for the saving. Therefore, further study need to be done with taking other influential variables and study their behaviour and the long time series can change the result.

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