EMPIRICAL STUDY ON DETERMINANTS OF HOUSEHOLD DEBT IN MALAYSIA

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ABSTRACT

The rapid increase in household debt relative to the growth of income and wealth attracted a lot of attention. While some of the increase was used to finance consumption, most was used to buy assets. National household debt in 2013 recorded ratio of household debt compared to the Gross Domestic Product (GDP) at its highest level against the developing countries in Asia. Increased household debt incurred citizens are now at a very alarming , according to Deputy Finance Minister Datuk Ahmad Maslan , household debt has reached RM800 billion or 89.2 per cent of Gross Domestic Product (GDP) 2012: 80.5 % , 2011: 76.6 % , 2010 : 75.8 % . This paper reviews the Household Income, House price and Base Lending Rate in destructing Household Debt. There is strong evidence indicate that the all those factors led arisen in household debt. Recent empirical results show the robustness of the relationship among Household Income, House Price and Lending Rate to Household debt.

Keywords: Household Income, House price and Base Lending Rate and Household Debt.

1.0 INTRODUCTION

1.1 OVERVIEW OF STUDY

Chapter 1 is cover about background of study, problem statement, research question, and research objective of the study. It is an overview about the entire component of the research. Definitions of terms are provided for understanding about the study that could be found throughout the research paper. Besides, limitation of the study also faced by researcher in order to complete the research paper.

1.2 BACKGROUND OF STUDY

Household debt is not in itself a cause for concern, as incurring a debt presents opportunities as well as risks. However, the rapid increase in household debt relative to the growth of income and wealth attracted a lot of attention. While some of the increase was used to finance consumption, most was used to buy assets. One concern about this high level of debt is that in the event of an economic downturn some households may have trouble servicing their debt. Households with high levels of debt that wish to reduce their level of gearing may be affected by falling asset prices.

According to Australian Bureau of Statistic, 2014, households or the household sector comprise all persons, unincorporated businesses and non-profit institutions serving households (e.g. churches, charities, political parties and trade unions). Unincorporated businesses, whose activities are inextricably mixed with personal activities, are extensions of households. Non-profit institutions serving households are included because data are not available to identify their activities separately. Housing debt is the value of lenders' loans outstanding to households for residential housing (i.e. owner-occupied housing and investment housing). Lenders comprise banks, building societies, credit cooperatives, finance companies, general financiers, registered financial corporations, government housing schemes, insurance corporations, and pension funds, securitises, housing cooperatives, and other financial institutions.

There are advantages connected with getting to credit to consume or invest. Credit empowers a family to gain riches by obtaining to purchase goods or services that increment in worth over the time. By acquiring fund, a

household can also enjoy a higher standard of living earlier than would otherwise be possible, and can maintain consumption levels when income is insufficient for immediate use.

Even though the borrowing fund seems can bring more advantage to individual and household but there also have risk associated with its debt repayments, the debt can increase over a time reflect to the interest charge and the household may experience debt collection or insolvency agreements, property repossession, or the adverse consequences was bankruptcy.

1.2.1 Household Debt in Malaysia

National household debt in 2013 recorded ratio of household debt compared to the Gross Domestic Product (GDP) at its highest level against the developing countries in Asia for the composition of household debt for four consecutive years 2010-2013 according to the classification shows that the percentage of housing loans is the highest loan category, followed by automobile loans, credit cards and personal (BNM report, 2014).

Increased household debt incurred citizens are now at a very alarming , according to Deputy Finance Minister Datuk Ahmad Maslan , household debt has reached RM800 billion or 89.2 per cent of Gross Domestic Product (GDP) 2012: 80.5 % , 2011: 76.6 % , 2010 : 75.8 % . The ratio between relatively high, compared to the regional countries. While the average household income kept moist at about 8 % per annum 2012: RM5, 000 (Ibn Yusof, 2013).

Apart from the debtor to satisfy the needs and requirements, undeniable increase in household debt is also projected to emerge from the current economic system, which also encourages the development of debt industry. Economic system based on industry visits also boost the public debt continues to owe. This means that as long as the system is continuously practiced, the trend of increasing debt either in the household sector, the government or in the private sector will continue to increase with the implication that will play havoc with our lives and our future generations. Even with the advent of consumer banking products increasingly innovative and accessible as personal loans, over the draft and credit cards, also seen an increase in the rise in cases of bankruptcy among Malaysian. Financial management is a skill that is very important for every individual because it helps guarantee the financial stability among Malaysian household.

1.3 PROBLEM STATEMENT

Increased burden of household debt in this country is one thing that is undeniable. Increasingly urgent necessities of life in addition to the cost of living rising forcing people prefer to owe. Household debt is a debt incurred by households through loans from financial institutions for a particular purpose. This debt is a liability or obligation that must be repaid in the future. Many countries were trying to maintain its household debt as the rapid development of household debt can create vulnerabilities in particular if the debt reaches an unsustainable level (Norhana Endut and Toh Geok Hua, 2010).

The household debts become more concerns among countries since the cost of living become more costly. In fact there also shows that many countries were having difficulties in controlling their household debt. This household debt also may effect on the financial performance of the Malaysia if there was not handle in serious (Don Nakornthab,2010). Based on the previous research done, it show that household debt grew at the more moderate pace of 7.9% in 2007, in line with the more subdued housing and automotive markets as at end-2007, household credit accounted for 56% of total outstanding bank loans (Norhana Endut and Toh Geok Hua, 2010). In fact at current research done by McKinsey & Company also shows that there have shown statistic on level of household debt among countries but not much deleveraging time passing by (McKinsey & Company,2015) .

Statistic from AKPK (Agensi Kaunseling Dan Pengurusan Kredit) shows that the increasing no of person that come to AKPK attend in DMP program(Debt Management Program) was about 38.4% for first quarter 2015. This number of percent who enroll in AKPK DMP program is high since this number of person attend was from January until April 2015 but it was already being close with the 2014 which the percent enroll was 39.2% for 12 month in 2014. This might be worries by countries since the household debt will be a effect on financial stability on the countries itself. The escalation in debt burden in the household sector at such high rates, as seen in other economies can eventually impact the debt repayment ability of households (Don Nakornthab, 2010). This increasing of household debt in Malaysia should be control before it comes to more serious condition (Sharezan Rahman, 2014). The study should be done on what factor contributing to this increasing of household debt in Malaysia. Specifically, the study is conducted to fulfil the following objectives:

1) To identify the relationship between house price towards household debts.
2) To examine the lending rate toward household debt.

3) To study relationship between household income

1.4 RESEARCH OBJECTIVES

The objectives have been developed based on the research questions. This is because the research questions and the research objectives must be in line in order to get the final result of this research. This research objective also divided into two which is:

1.4.1   Main Research Objective
1.4.1.1   To examine the factors influence household debts in Malaysia

1.4.2   Specific Research Objectives
1.4.2.1   To investigate the relationship between house price towards household debts
1.4.2.2   To examine the relationship between the lending rate with household debt
1.4.2.3   To investigate the relationship between the household income towards household debt.

1.5   RESEARCH QUESTIONS
There are several questions occurs in this research. The questions have been classified into two categories which are main research questions and specific research questions. They are produced based on the variables that have been selected in the research.

1.5.1 Main Research Question

1.5.1.1 What is the factor that distributed to household debt in Malaysia?

1.5.2   Specific Research Question
1.5.2.1   What is the relationship between house prices with the household debt?
1.5.2.2   What is the relationship between lending rate with household debt?
1.5.2.3   What is the relationship between household incomes affecting household debt?

1.6   SIGNIFICANCE OF STUDY
The study done is to obtain as much information to better understand the effect of selected variables towards the household debt in Malaysia. In this research, it is presumed that there is a strong relationship between the variables and the household debt. The research findings could provide the basis for a deeper and more accurate understanding of the performance of household debt in Malaysia.

This study useful to give beneficial and added knowledge to all related parties such as:

Organization

This study might have been done by others researcher previously, but this study will be different. Through this research, the result can be used by Agensi Kaunseling dan Pengurusan Kredit (AKPK) as an additional knowledge for them and can help to monitor the household debt in Malaysia. Through the finding from the research, it also can be used to find a better solution to overcome the company problem.

People

This result of study would give knowledge and awareness of people regarding the rising of household debt in Malaysia at the stage worried. Then from that, it will give people the right way to spend their money in buying their goods and services.
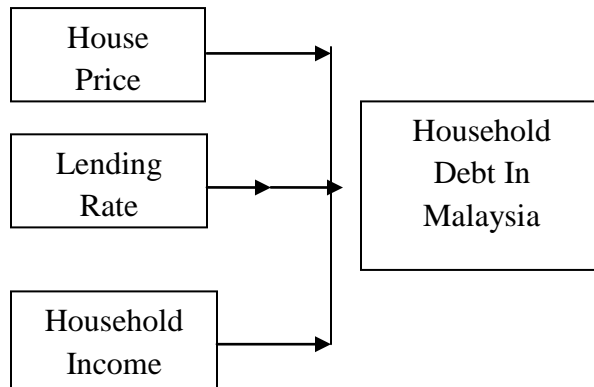
1.7 CONCEPTUAL FRAMEWORK

Diagram 1: The conceptual model of this research.

The conceptual framework above shows the independent variable that was going to test whether is there any relationship with the dependent variable. The independent variables for this conceptual framework are house price, lending rate, and household income while the dependent variable is household debt in Malaysia.

1.8 HYPOTHESIS

1.8.1 Hypothesis 1

H_0 : There is no significant relationship between house price and household debt in Malaysia.

H_1 : There is significant relationship between between house price and household debt in Malaysia.

1.8.2 Hypothesis 2

H_0 : There is no significant relationship between lending rate and household debt in Malaysia.

H_1 : There is significant relationship between lending rate and household debt in Malaysia.

1.8.3 Hypothesis 3

H_0 : There is no significant relationship between household income and household debt in Malaysia.

H_1 : There is significant relationship between household income and household debt in Malaysia.

1.8 LIMITATION OF STUDY
In conducting this study, the researcher faced the following barriers:

1.8.1 Journal Availability
The publish journals are not published in complete report. Moreover, some of journal are required us to sign up or purchased the journals published. The lack of availability of published journals subscribed by the university has affected the development of conducting this research successfully.

CHAPTER 2

LITERATURE REVIEW

2.0 INDEPENDENT VARIABLE

2.1 House Price

The household debt in this country can be influenced by several factors. According to Shahrezan in 2014, the increasing of household debt in Malaysia may due to increase of several factors including , house price, change in GDP, and interest rates. The results of the studies from Shahrezan in 2014, showed that the change in the debt ratio depends positively on house price where if the house price become more high it will reflect to increase in debt ratio too.

This increase in debt ratio was come from the increase in household debt in Malaysia. Nazreen A. Ghani, 2010, also mentioned that the bulk of household debts are mainly for asset acquisition with housing loan and motor vehicle financing accounting for over 75% of household loans as at end-2008. Considering this housing loan account for about half of total household loans, house price movement are expected to be significant force of household indebtedness. This change in house price has direct effects on household wealth said Nazreen A. Ghani, 2010, in his journal of Household Indebtedness and Its Implications for Financial Stability in Malaysia.

Mckinsey in 2015 said that countries in which a large share of the population crowds into a small number of cities have higher real estate prices and household debt. This shows that the price of the house have positive relationship with the household debt where when the house price increase, the household debt also will increase. The relationship between rising house prices and rising household debt was also apparent across US states in the years prior to the crisis. States with the fastest increases in house prices from 2000 to 2007—California, Nevada, Arizona, and Florida—also had the greatest growth in debt as mentioned in Mckinsey 2015.

Furthermore, the study conducted by Annalisa Cristini & Almudena Sevilla Sanz, 2011 found that the older people and younger people are no different on the way house price affect their consumption. Its mean that the house price really have affected on household debts since it reflect to the consumption incurred by both gender in the research conduct at UK. This also supported by (Martin Browning, Mette Gortz and Soren Leth-Petersen, 2013) has given opinion that the house prices do impact total expenditure through improved collateral rather than directly through wealth.

Next, the fact that the house prices affect the households debt can be seen from the research done by Katya Kartashova and Ben Tomlin in 2013 said that they have positive and significant relationship house prices with total household debt. This suggests that the household-level relationship between house prices and debt goes beyond the purchase of real estate.

2.2 Lending Rate

Despite from that, it said that the household indebtedness in Malaysia has grown from 33% of banking sector loans in 1998 to 55% in 2011, representing 76.6% of the GDP (Maznita Mokhtar & Azman Ismail, 2013). The author belief that this increasing in household debt might be affected by the lending rate as charge by the bank to the consumer who borrow loan. Besides that, in this journal it said that the income level and the house price will have impact on the household debt. Both author Maznita Mokhtar & Azman Ismail (2013) and Shahrezan, 2010, said that the interest rate will affect the household debt in Malaysia. They stated that if the interest rate is low, consumer will make more loans to finance consumer purchase then this will result to increase in debt burden.

Goodhart & Hoofman (2007) also support that this increase of household might be cause of the lending rate. They mentioned in their article that this increase in the household might be contributed to lower lending rate which is when the lending rate is lower, the consumer will go for loan to buy a property and it will reflect to increase in property price since they will have high demand in market for the property. Then this is said to be affect to the increasing in household debt since it will increase debt between household since they will make much loan to purchase the property.

This relation with house price and the lending rate also was mentioned by Oikarinen (2009). Nazreen (2010) said in his journal that lending rates or costs of borrowing are expected to be the main force of household indebtedness

as households are expected to borrow more when the cost of borrowing is lower. As lending rates start to rise, this trend may induce greater caution on households to incur additional or new debts and vice-versa. Higher rates may also cause existing borrowers to face difficulties to repay their debt, subsequently causing delinquencies. This was supported by the statistic shows that about 60% of banking system household loans is based on floating rates. Norhana Endut & Toh Geok Hua, (2009) also said that low cost of borrowing will increase the incentives of consumer to borrow in order to smooth their path of the consumption.

From another point of view, Anandakumar, (2011) said that interest rate was one of factor that contributed to increasing household debt in Malaysia. The author belief that the very low interest rate that prevailed during 2009 and most of 2010 was also reason for increasing household debt in Malaysia. According to Australian Bureau of Statistic 2014, at the end of 2013, three-quarters of all household debt was borrowing for housing, and housing interest rates are currently relatively low. Between June 1989 and March 1990, large bank lenders charged interest at an average of 17% per annum on their standard variable owner-occupied housing loans. In April 2014, large bank lenders were charging an average of just under 6% per annum on these loans, and even cheaper housing finance was available from other lenders. For example, the average interest rate charged by large mortgage managers on their basic variable owner-occupied housing loans in April 2014 was 5% per annum. Some smaller lenders and online banks were offering housing loan interest rates below 5% per annum in early May 2014. This shows that the interest rate have favour the household unit to make borrowing when the interest is low & the result later it might burden the household to repayment their household debt.

2.3 Households Income
Next factor that should focus on regarding increasing in household debts is income. According to Karen and Donand in 2007 there is positive relationship between household income with household debt where if incomes expect to rise over time until retirement households tend to borrow on when they were young that reflect in move into positive net worth as they age, and then run down their net worth in retirement. This shows that the household like to spend for their desired for goods as they think that expected income will rise over the year until they retired without measure the risk on the lost in purchasing power when the inflation occur. This will result to increase in debt burden of household seems they were like to borrow more loan to finance their purchase.

Gauti B. Eggertsson and Paul Krugman (2010) stated also in their journal of debt, deleveraging and the liquidity trap, that the debt incurred by households was related to the income derived. The more income the person have the more debt they will incurred. Meanwhile Nazreen (2010) said that the household income with household debt have negative relationship where the growth in income level can stable the increasing of household debt within the countries. This show that theoretically the household debt has relationship with the income as if the income rise the household debt can be maintained stable or else there will have increase in household debt when the aggregate income in the countries is no fair enough with the purchasing power in the market.

Besides that, Nazreen 2010 stated that a household willingness and need to borrow rely heavily on income. Other that Norhana Endut & Toh Geok Hua said in their journal 2009, if a household experiencing a loss of part or entire income with insufficient buffers, it would lead to great difficulty in repayment leading them to default on their loans.

In the journal by Mckinsey 2015, the author stated that despite the tightening of lending standards, household debt relative to income has declined significantly in only five advanced economies—the United States, Ireland, the United Kingdom, Spain, and Germany. By looking from the author journal it can concluded that even though the lending rate had been tightened in some countries but the household debt still growing reflect to the income of household. This might because the household was expect to purchase more when their income rise as a result it may be burden for the household if there was some loss a part from household income in future resulting to increasing in household debt.

Don Nakornthab in 2010 also said that in the research study of Thailand that even though Thai households on average are financially sound; low-income and less financially literate households are more likely to experience financial difficulties in times of economic shocks as their debt service ratio is more than twice as high as the average debt service.

A research conduct in United Stated shows the target respondent experiencing larger wealth losses, particularly those with poorer and more levered households, experience a larger reduction in credit limits, refinancing likelihood, and credit scores. This research was conduct by Atif Mian, Kamalesh Rao and Amir Sufi, 2013, Household Balance Sheet, Consumption, and the Economic Slump. Cesaire A. Meh, Yaz Terajima, David Xiao Chen, and Tom Carter, 2009, argues that the household income shows a negative relationship with total income.

CHAPTER 3

RESEARCH METHODOLOGY

3.0 CONCEPTUAL FRAMEWORK

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┌──────────┐
│  House   │────────────┐
│  Price   │            │
└──────────┘            ▼
                  ┌──────────────┐
┌──────────┐      │  Household   │
│ Lending  │─────▶│   Debt In    │
│   Rate   │      │   Malaysia   │
└──────────┘      └──────────────┘
                        ▲
┌──────────┐            │
│Household │────────────┘
│  Income  │
└──────────┘
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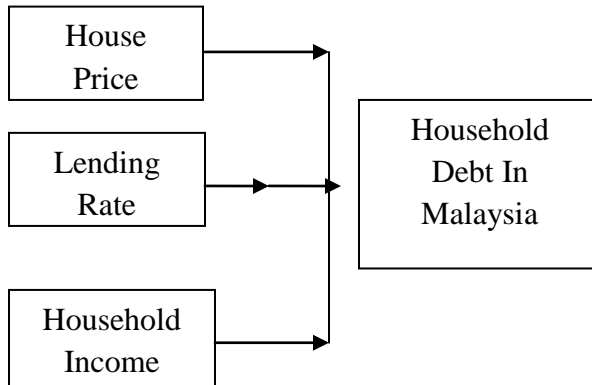
Diagram 1: The conceptual model of this research.

The independence variable of this conceptual model was take from previous research done that relate with this area of topic as to test whether if there any relationship between the independence variables towards the dependant variable. The independence variable of lending rate and house price was same as from Shahrezan Rahman and Mansur Masih, 2014, Increasing Household Indebtness And Its Implications For Financial Stability In Malaysia. The household income independence variable was taken from Norhana Endut and Toh Geok Hua, 2009, where it mention that the household income will have relationship with the increasing of the households debt.

2.4 INTRODUCTION

In this chapter, the focus is on the methodology used in the study. It include the data collection, data source, variables, research design, conceptual research framework, sampling design, test consideration for data analysis, hypotheses statement and conclusion. It will highlight the research method and the statistical technique in determining the relationship between the four selected variables namely regulatory environment, technology, consumer demand and liquidity.

2.5 DATA COLLECTION

The data collection involves the process of gathering information and data either from primary or secondary data. Basically, the data used in this study was collected from the secondary data which is the data collected from someone else for other purposes. There are several sources of data that are used in this research:

2.5.1   Electronic sources
The data was collected from e-sources that provided in the library web of Universiti Teknologi Mara (UiTM) from Data Stream Thomson Reuters One. All the data of housing price, interest rate, and average household income in Malaysia are collected from all these databases. The latest data also provided instead of previous data.

2.5.2   Additional Data
Secondary data sources about statistic regarding the number of people who went to the AKPK to get help regarding the debt burden derived from Malaysia as show from 2007 until March 2015 as AKPK establish at year 2006.

2.6 VARIABLES
A variable is anything that can take on offering or varying values. The values can differ at various times for the same or different objects or persons. Variables consist of two which is dependent variables and independent variables.

2.6.1   Dependent Variable
The dependent variable is the variable that gives primary concern of researcher, whose aim to predict or detect the effect caused by the independent variable. This research project has use Household Debt as dependent variables that will support by independent variables to analyze what is the factors affecting Household Debt in Malaysia. In analyzing household debt, indicator that being used to get data was private consumption expenditure where the data collection method derived from information regarding on loans, deposits from households, life and selected general insurance premium paid, information on of electricity to residences and components of transport, communications and others related to households expenditure.

2.6.2   Independent Variable
An independent variable is one that influences the dependent variable in a positive or negative result. In this research, housing price, interest rate, and average household income are the independent variables that used to find the relationship between dependent and independent variables in order to get the final result of this research.

2.7 RESEARCH DESIGN
Research design involves a series of rational decision making choices with issues relating to decision regarding the purpose of the study, the types of investigation, the extent of researcher interference, the study setting, the unit of analysis and the time horizon of the study.

2.7.1   Purpose of Study
Research serves many purposes. Three of the most common and useful purposes are exploration, description and causal hypothesis testing. Many studies can and often have more than one of these purposes but each has different implications for other aspects of research design. The purpose of this study is to analyze the cause and effect relationship of the selected factors that influence the Household Debt In Malaysia, focusing on housing price, interest rate, and household income.

2.7.2   Type of Investigation
Basically, there are three types of investigation which are clarification, correlation and causal. In the first type that is clarification investigation, the purpose is to obtain a better comprehension of the concepts involved in the research problem. A correlation relationship is where two or more concepts or variables move simultaneously. In this research study however, the type of investigation falls under causal investigation. Here it shows the effect of one concept or variables can cause a change or movement in another concept or variables.

2.7.3   Research Interference

Researcher interference involves the extent of interference by the researcher on the variables under study which has a direct bearing on the research decision. However, as this research is hypotheses testing based on observations of past data of variables and its relationship to the Household Debt in Malaysia, there is minimal or no interference at all by the researcher. This research aims to identify the relationship between selected variables and Household Debt in Malaysia by using causal investigation technique

2.7.4   Study Setting

The studies are non-contrived setting or field experiments but with researcher interference to a moderate extent.

2.7.5   Unit of Analysis

In this study, organization has been choosing as unit of analysis because the data is collected within Malaysia only. Changes in these independent variables are then studied as to their effect on the Household Debt in Malaysia.

2.7.6   Time Horizon

 Longitudinal studies

- ✓ The collection of data of housing price, interest rate and household income is obtained from the time series of year 1998 until 2014 quarterly.

- ✓ The scope of study is concentrate on for an area which is housing price, interest rate and household income that may affect the household debt in Malaysia.

2.8 DATA ANALYSIS

2.8.1   Test for Stationary: Unit Root-Test

Stationary is a condition with a constant mean, constant variance, and constant auto covariances for each given lag. By using the ADF Unit Root Test (Augmented Dickey-Fuller), the variables can be tested either data is significantly stationary or need to make changes to make it accurate during the study. The test for stationary is the p-value of the ADF statistic. If the p-value is below than 5% significant level then, the null hypothesis is rejected and it can be concluded that the data variable is stationary.

H_o: Data is non-stationary.
H_1: Data is stationary.

2.8.2   Descriptive Analysis

Descriptive analysis is done to determine the data set are measures of central tendency (include the mean, median, and mode) and measures of variability or dispersion (the standard deviation (or variance), the minimum and maximum variables, kurtosis and skewness.

2.8.3   Correlation Analysis

Correlation analysis is done to determine whether if there exists any linear relationship or correlation of the dependent variable with any of the independent variables.

2.8.4   Multicollinearity Test

 Multicollinearity test is done to identify whether if there exist correlation higher than 0.80. the multicollinearity problems exist when the independence variables correlation is more than 0.80.

2.8.5   *Multi Linear Regression model*

Multiple regression is a method of data analysis that is use to examine the significant relationship of a dependent variable to any other independent variable factors. The independent variables act to predict the result of dependent variable. Equation of Multiple Linear Regression Model is as be

Where;

r_{hdd} = Δ Households Debt

$r_{blr,t}$ = ΔBank LendingRate

$r_{hpi,t}$ =ΔHouse Price Index

$r_{hhi,t}$=ΔHouseholds Income

$β_i$ = Regression coefficient

$μ_t$ = Error term

Thus, the multiple linear regression models are used to explain how each of the independent variables (bank lending rate, house price index and household income) is significant to the dependent variable (household debt in Malaysia).

2.8.6   *Correlation Analysis*

Correlation analysis is done to determine whether if there exists any linear relationship or correlation of the dependant variable (Household Debts) with any of the independence variables (Households Income, Housing Price and Lending Rate).

2.8.6.1F-Test

F-Test is used when multiples parameters are involved in this model. It is to compare statistical models that have been fit to a data set to identify which model best fits the population from sample data. If the p-value of F-Test is less than 5% significant   level, it indicates that the null hypothesis is rejected. We can conclude that at least one of independent variables is important in explaining the dependent variable.

H_O: No independent variables affect the dependent variable.
H_1: At least one of independent variables affects the dependent variable.

2.8.6.2   Coefficient determination (R2)

of
$$r_{hdd} = \beta_0 + \beta_{hdd,hpi}r_{hpi,t} + \beta_{hdd,blr}r_{blr,t} + \beta_{hdd,hhi}r_{hhi,t} + \mu_t$$

R2 is a measure of overall fit in the sense of measuring how close the points are to the estimated regression line in the regression plot. It is a test of goodness of fit and is used to determine how good the regression fits the data. R^2 measure the proportion of total variation of dependent variable as explain by the regression. if R^2 value is 1, it indicate strong correlation relationship between dependent and independent variables and if R^2 value is 10, changes of variation of dependent variable are not explained by the independent variables.

2.8.6.3   *Normality test*

Jarque-Bera test is use as the normality test. It is to determine if the error term is normally distributed. It focuses on the p-value of Jarque-Bera statistic. If the p-value of Jarque –Bera is greater than 5% significance level, this indicate that fail to reject the null hypothesis and can conclude that the error term is normally distributed.

H_O: Error term is normally distributed.

H_1: Error term is not normally distributed.

2.8.6.4   Autocorrelation-Serial Correlation Test

It use Breush-Godfrey Serial Correlation LM test to investigate whether there is serial interdependence for the error term. It is also use to determine the correlation between two different time series data. The condition of autocorrelation is when residuals are related to each other and it can be confirmed from p-value of Chi-Square of Obs*R-Squared statistic. If the p-value of Obs*R-Squared is more than 5% significance level, it shows that the researcher is fail to reject the null hypothesis.

H_O: Error term is serially independent (no autocorrelation problem).

H_1: Error term is not serially independent (have autocorrelation problem).

2.8.6.5   *Heteroscedasticity- Variance of Error Term Test*

Heteroscedasticity is a problem when the error terms do not have constant variances; unequal variance. It is a condition where the conditional variance of Y population varies with X. Breusch-Pagan-Godfrey is a test of heteroscedasticity and it can be detected from the probability of Obs*R-Squared. If p-value of Obs*R-Squared is more than 5% significance level, researcher is fail to reject the null hypothesis.

H_O : Error term is homocedastic (error term have constant   variance).

H_1: Error term is heteroscedastic (error terms do not have   constant)

2.8.6.6   *Ramsey RESET Test*

Test on functional form is use to determine there is no misspecification of functional form and the data is fit multiple linear regressions. The p-value to be used can either be t-statistic, f-statistic or the likelihood ratio. If the p-value is greater than 5% significance level, the researcher is fail to reject the null hypothesis.

H_O: No misspecification

H_1: Error in specification

2.9   HYPOTHESIS STATEMENT

Hypothesis statement can be defined as logical conjecture statements of the relationship between two or more variables expresses in the form of a testable statement, which carry clear implications for testing the stated relations. By testing the hypothesis, it is expected that solution could be identified to correct the problem encountered. Hypothesis elements are:-

I   Null Hypothesis (H_0)

It is statements that express no relationship (significant) between variables.

II   Alternate Hypothesis (H_1)

It is statements that express relationship (significant) between variables.

2.9.1   Main Hypothesis statement
H_0 : There is no significant influence by those independent variables.
H_1 : There is significant influence by those independent variables
2.9.1   Specific Hypothesis Statement
2.9.1.2   House Price
H_0 : House price has no relationship (significant) with households debt.
H_1 : House price has a relationship (significant) with households debt.
2.9.1.3.Lending Rate

H_0 : Lending rate has no relationship (significant) with   households debt.

H_1 : Lending rate has a relationship (significant) with   households debt.

2.9.1.4 Households Income

H_0 : Households income has no relationship (significant)   with households debt.

H_1 : Household income has a relationship (significant) with   households debt.

Summary

This chapter explains the research design that will be applied in the study. The purpose of this study is to determine the relationship between the dependent variable (Households Debt In Malaysia) and the independent variables (House Price, Lending Rate, and Household Income). A set of quarterly observations for each of the variables beginning from 1998 Q1 to 2014 Q4 are used. Data for the variables are obtained from the same source which is from Bank Negara Malaysia (BNM), Agensi Kaunseling Dan Pengurusan Kredit(AKPK) and Thomson Reuters One. All the data will be subjected to several empirical test to investigate the relationship with households debt. The tests list include, Unit Root Test, Descriptive Test, Correlation Analysis, Multicollinearity, Multiple Linear Regression (F-test, Coefficient of Determination R^2, Adjusted R- squared and Durbin Watson.) , Normality Test, Autocorrelation, Heteroscedasticity, Test on Functional Form. The result of the tests will be highlighted and discussed in the next chapter. The empirical results from the test are expected to provide insights for answering the hypothesis statement

CHAPTER 4

DATA ANALYSIS

3.0 INTRODUCTION

This chapter discusses on findings of this study on the determinants towards the households debt in Malaysia. The analysis of data will be discussed based on several steps. First step is to check if the data is stationary using unit root test. After that is the covariance analysis of all variables from the stationary data should be performs. Continued by performing multiple linear regression; for the purpose to test on the overall test and the individual test of each variable. The final step is essential to check on the assumption. This includes normality test, serial correlation test, heteroscedasticity test, test on functional form and multicollinearity test.

3.1 Stationary Analysis

As stated in chapter three stationary tests, ADF test had been chosen to conduct unit root test. All variables were stationary at first difference. Hence, to get all variables stationary at level, the data were log to make sure all raw data was positive. Below is the summary of the stationary data.

	Augmented Dickey-Fuller Test			
	LEVEL		1ST DIFFERENCE	
Variable	No Trend	Trend	No Trend	Trend
HDD	-3.1881 (0.0251)	-2.9441 (0.1558)	-6.7474 (0.0000)***	-6.8072 (0.0000)***
HHI	-1.2531 (0.6463)	-2.5699 (0.2951)	-17.1593 (0.0000)***	-17.03206 (0.0001)***
BLR	-7.7651 (0.0000)	-9.3310 (0.0000)	-6.3201 (0.0000)***	-7.2525 (0.0000)***

	Augmented Dickey-Fuller Test			
	LEVEL		1ST DIFFERENCE	
Variable	No Trend	Trend	No Trend	Trend
HPI	-5.5679 (0.0000)	-5.3698 (0.0002)	-6.3543 (0.0000)***	-6.5343 (0.0000)***

Table 4.1 Stationary analysis

Based on table 4.1 above, at beginning all result are non-stationary at level when the variables were being test for unit root. Then, all variable were test at 1st difference using unit root test. The result from ADF test shows, the p-

value for HDD is 0.000 which is less than 0.1. Reject null hypothesis if the results of ADF test is significant. Therefore it can be concluded that the data is stationary.

The unit root test for HHI is test at 1st difference and it has been test by using trend and intercepts equation. Based on the result, the p-value of HHI shows 0.0001 which is significant at 5% Level. The result indicates that t-statistic value is less than p-value thus the null hypothesis is rejected. The result shown the P-value of HHI is 0.0001, which is less than 5% level of significance. These findings reject the null hypothesis and conclude that there is significant relationship between HHI and household debts in Malaysia.

The unit root test for BLR is test at 1st difference and it has been test by using trend and intercepts equation. Based on the result, the p-value of BLR shows 0.000 which is significant at 5% Level. The result indicates that t-statistic value is less than p-value thus the null hypothesis is rejected. The result shown the P-value of BLR is 0.0000, which is less than 5% level of significance. These findings reject the null hypothesis and conclude that there is significant relationship between BLR and household debts in Malaysia.

The unit root test for HPI is test at 1st difference and it has been test by using trend and intercepts equation. Based on the result, the p-value of HPI shows 0.000 which is significant at 5% Level. The result indicates that t-statistic value is less than p-value thus the null hypothesis is rejected. The result shown the P-value of BLR is 0.0000, which is less than 5% level of significance. These findings reject the null hypothesis and conclude that there is significant relationship between HPI and household debts in Malaysia.

3.2 Descriptive Analysis
The table below shows the highlight on descriptive statistics of the underlying variables.

	RHDD	RHPI	RBLR	RHHI
Mean	0.742917	0.014347	-1.275042	2.005786
Median	0.790995	0.000000	-0.746005	0.977823
Maximum	155.3591	190.1278	11.56768	133.0234
Minimum	-208.0756	-122.8205	-22.71356	-117.1543
Std. Dev.	41.46868	32.13875	4.195449	36.76568
Skewness	-0.837261	1.854255	-1.630982	0.195941
Kurtosis	16.44431	23.66565	12.79897	5.311959
Jarque-Bera	520.0682	1248.996	302.2040	15.57972
Probability	0.000000	0.000000	0.000000	0.000414
Sum	50.51836	0.975617	-86.70284	136.3935
Sum Sq. Dev.	115216.7	69204.25	1179.320	90564.90
Observations	68	68	68	68

Table 4.2: Descriptive statistics

Based on the table above, mean for each variable are positive except for BLR (Bank Lending Rate) which is -1.275042and the highest mean of variables is HHI (Household Income) which is 2.005786. Median for all variables is positive except for BLR (Bank Lending Rate) which is -0.746005and the highest median is stock market HHI (Household Income) which is 0.977823. Besides that, standard deviation BLR (Bank Lending Rate) is the lowest which is 4.195449 and the highest is HHD (Households Debt) which is 41.46868.

The skewness and kurtosis values of HDD return shows that the return is characterized by a strong deviation from normality. The skewness value indicates that the returns of HDD and BLR have negative skewed distribution. In addition, the values of kurtosis for variables return is higher than the kurtosis value for normal distribution, which is three. Therefore, all series of return have a leptokurtic distribution where the distribution with sharper peak & fatter tails compared to the normal distribution.

The Jarque-Bera values for the variables returns confirmed that the returns do not follow a normal distribution. These are supported by statistically significance of the Jarque-Bera Tests at 5% significant level.

3.3 Correlation Analysis

Correlation analysis need to be done because to identify the relationship between dependent variable (Household Debts) and independent variables (Housing Price, Household Income, Bank Lending Rate). The result of the correlation matrix of the stationary data is shown as table below.

Covariance Analysis: Ordinary
Date: 06/14/15   Time: 15:29
Sample: 1 68
Included observations: 68

Correlation t-Statistic Probability	HDD	HHI	HPI	BLR
HDD	1.000000 ----- -----			
HHI	0.316964 2.715021 0.0084	1.000000 ----- -----		
HPI	0.789851 10.46275 0.0000	0.318825 2.732758 0.0081	1.000000 ----- -----	
BLR	-0.618010 -6.386323 0.0000	-0.663966 -7.213627 0.0000	-0.625570 -6.514172 0.0000	1.000000 ----- -----

H_0:   There is no correlation.

H_1:   There is correlation.

From the above test result, it can be seen that there are 3 pair of values which is (HDD,HHI), (HDD,HPI), and (HDD,BLR) with a value of 0.0084, 0.0000, and 0.0000 respectively. We can observe that p-value of the pair of (HDD,HHI), (HDD,HPI) and (HDD, BLR) is 0.0084, 0.0000 and 0.0000, which indicates that the null hypothesis is rejected at 5% significance level. Therefore, we can conclude that there is a (positive) correlation between the variable HDD with HPI, HPI and BLR. In other word, households debt have a linear relationship or correlation with households income, housing price and bank lending rate.

3.4 Multicollinearity Test

	RBLR	RHHI	RHPI
RBLR	1.000000	0.026757	-0.197700
RHHI	0.026757	1.000000	0.026574

RHPI	-0.197700	0.026574	1.000000

Multicollinearity problem exist if there is correlation coefficient higher than 0.80.

The results show that there is no multicollinearity problem since all the correlations the IV are less than 0.80.

3.5 Regression Analysis

As stated in chapter 3, regression analysis was done to show the coefficient is significant or not. The multiple linear regression model used is specified as below.

$$r_{hdd} = \beta_0 + \beta_{hdd,blr}r_{blr,t} + \beta_{hdd,hpi}r_{hpi,t} + \beta_{hdd,hhi}r_{hhi,t} + \mu_t$$

Where;

r_{hdd} = Δ Households Debt

$r_{blr,t}$ = ΔBank Lending Rate

$r_{hpi,t}$ = ΔHouse Price Index

$r_{hhi,t}$ = ΔHouseholds Income

β_i = Regression coefficient

μ_t = Error term

Dependent Variable: HDD

Method: Least Squares

Date: 06/10/15   Time: 23:46

Sample: 1 68

Included observations: 68

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.02302	4.094259	2.936555	0.0046
HHI	-2.00E-05	3.71E-05	-0.539995	0.5911
HPI	0.246336	0.036171	6.810313	0.0000
BLR	-0.703081	0.349481	-2.011788	0.0485

R-squared	0.650679	Mean dependent var	18.82012
Adjusted R-squared	0.634305	S.D. dependent var	5.317244
S.E. of regression	3.215482	Akaike info criterion	5.230854
Sum squared resid	661.7169	Schwarz criterion	5.361413

Log likelihood	-173.8490	Hannan-Quinn criter.	5.282586
F-statistic	39.73758	Durbin-Watson stat	0.709759
Prob(F-statistic)	0.000000		

3.6 COEFFICIENT

In identifying independent variables that could be dropped from the model, the approach is observing the p-value of the t-test statistic for the coefficient of each variable. Where the p-value t-test statistic is lower than the 5% significance level the variable should be retained in the regression model. Additionally, the results obtained from the regression table can be explained by placing the result into the econometric equation. Based on the result, house price shows a positive relationship with the households debt while household income and bank lending rate shows negative relationships.

3.6.1   Households Income
H$_1$: There is no significant relationship between households income and households debt in Malaysia.
The coefficient value of households income is -2.00E-05. This value shows that for one percent decrease in households income, households debt will increase by 2.00E-05 percent assuming other variables remain constant. The p-value of households income is 0.5911, which is more than 5% level of significance. This finding accept null hypothesis and conclude that there is negative relationship between households income with households debt.

3.6.2   House Price Index
H$_2$: There is significant relationship between house price and households debt in Malaysia.
For house price index, the coefficient value is +0.2463. This value indicates that for one percent increase in house price index, households debt will also increase by 0.2463 percent as well, assuming other variables remain constant. The p-value of exchange rate is 0.0000, which is slightly less than 5% level of significance. The finding rejects the null hypothesis and concluded that there is relationship (significant) between house price index with households debt.

3.6.3   Bank Lending Rate
H$_2$: There is significant relationship between lending rate and households debt in Malaysia.
The coefficient value of bank lending rate is -0.7031. This value indicates that for one percent decrease in bank lending rate, households debt will increase by0.7031 percent assuming other variables remain constant. The p-value of bank lending rate is 0.0485, which is less than 5% level of significance. This finding reject null hypothesis and conclude that there is relationship (significant) between bank lending rate with households debt.

3.6.4   Coefficient of Determination (R²)
In Model 1, the value of R² obtained 0.650679 which means only 65.07% of the variables are explained by Households Debt. The remaining 34.93% of the variation are determined by other factors.

3.6.5   Adjusted R²
As observed from the regression result, adjusted R² is 0.634305 . This indicates that 63.43% of variation in households debt is explained by the chosen variable namely households income, house price index and bank lending rate.

3.6.6   F-Test
In this Model , the test statistic here is the F-test of which the value here 39.73758. The P-value of the F-test is 0.000000.
Therefore, at 5% level of significance we can reject the null hypothesis and can conclude that at least one of independent variable is useful in predicting households debt.

3.6.7 Durbin Watson Test

The result of the regression indicates a Durbin Watson statistic 0.709759 for this Model, which means that it is consistent with serial correlation. This can be confirmed by observing the outcome of the Autocorrelation test conducted under Breush-Godfrey Serial Correlation LM Test whether the result is the same.

3.7 Normality test
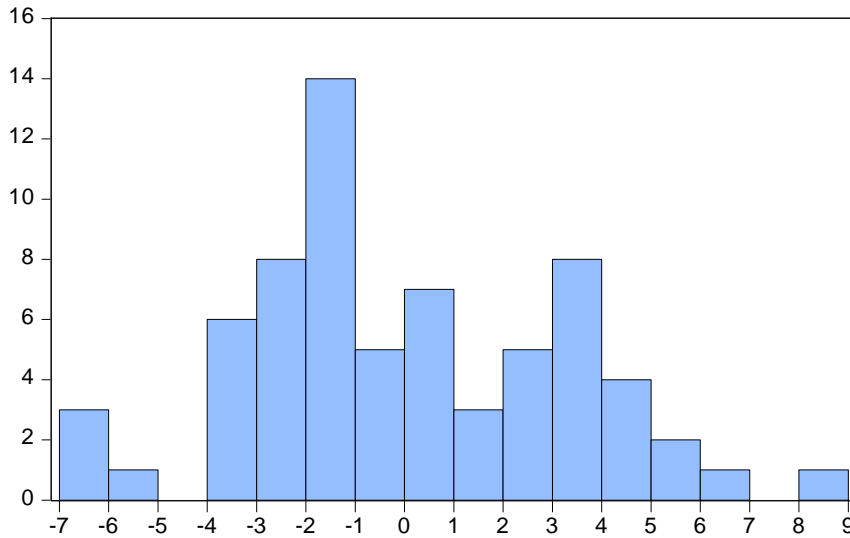
Series: Residuals	
Sample 1 68	
Observations 68	
Mean	1.31e-15
Median	-0.505729
Maximum	8.011115
Minimum	-6.460626
Std. Dev.	3.142669
Skewness	0.211466
Kurtosis	2.682311
Jarque-Bera	0.792758
Probability	0.672752

H_0:   Error term is normally

H_0: Error term is normally distributed.

H_1:   Error term is not normally distributed

Jarque-Bera test is use to identify whether the error term are normally distributed or not. If the p-value of Jarque-Bera is greater than 5% significance level, thus it fails to reject null hypothesis. The result of Jarque-Bera is test is given above. From the statistic obtained Jacque-Bera is at 0.792758 and the corresponding p-value is 0.672752. Since p-value is more than 5% level of significance the alternative hypothesis is rejected which mean the error term is normally distributed.

3.8 AUTOCORRELATION TEST – SERIAL CORRELATION TEST

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	22.64162	Prob. F(2,62)	0.0000
Obs*R-squared	28.70216	Prob. Chi-Square(2)	0.0000

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 06/14/15   Time: 17:02
Sample: 1 68
Included observations: 68
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.268402	3.270634	1.305069	0.1967
HHI	-1.48E-05	2.88E-05	-0.513190	0.6096
HPI	-0.041782	0.028952	-1.443131	0.1540

BLR	-0.295770	0.276620	-1.069228	0.2891
RESID(-1)	0.664356	0.125324	5.301124	0.0000
RESID(-2)	0.002853	0.127007	0.022460	0.9822

R-squared	0.422091	Mean dependent var	1.31E-15
Adjusted R-squared	0.375485	S.D. dependent var	3.142669
S.E. of regression	2.483534	Akaike info criterion	4.741340
Sum squared resid	382.4124	Schwarz criterion	4.937179
Log likelihood	-155.2055	Hannan-Quinn criter.	4.818937
F-statistic	9.056648	Durbin-Watson stat	1.909979
Prob(F-statistic)	0.000002		

H_0:   Error Term is serially independent.
H_1:   Error Term is not serially independent

As can be observed, the probability value to be used here is that of the "Obs*R-squared". P-value (presented by Prob.Chi-Square(9) is 0.0000 which is less than 5% level of significance. Therefore the alternate hypothesis is accepted which mean that the data used are serially dependent for the error term. (Have autocorrelation problem).

3.9 HETEROSCEDASTICITY TEST – VARIANCE OF ERROR TERM TEST

Heteroskedasticity Test: White

F-statistic	2.893442	Prob. F(9,58)	0.0068
Obs*R-squared	21.07051	Prob. Chi-Square(9)	0.0123
Scaled explained	15.69978	Prob. Chi-Square(9)	0.0734

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 06/14/15   Time: 17:10
Sample: 1 68
Included observations: 68

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	428.1467	170.8224	2.506385	0.0150
HHI	-0.003102	0.002923	-1.061526	0.2929
HHI^2	1.48E-08	1.31E-08	1.126888	0.2644
HHI*HPI	1.27E-06	3.22E-05	0.039477	0.9686
HHI*BLR	0.000417	0.000236	1.767197	0.0825
HPI	-6.160064	2.390728	-2.576648	0.0125
HPI^2	0.017679	0.005704	3.099467	0.0030
HPI*BLR	0.504717	0.218068	2.314498	0.0242
BLR	-64.48736	27.24580	-2.366874	0.0213
BLR^2	2.317072	1.059412	2.187130	0.0328

R-squared	0.309860	Mean dependent var	9.731130
Adjusted R-squared	0.202770	S.D. dependent var	12.71550
S.E. of regression	11.35338	Akaike info criterion	7.831962
Sum squared resid	7476.162	Schwarz criterion	8.158360
Log likelihood	-256.2867	Hannan-Quinn criter.	7.961291
F-statistic	2.893442	Durbin-Watson stat	1.488338

Prob(F-statistic)   0.006786

H_0: Error term is homoscedastic. (Error term have constant   variance)
H_1: Error term is heteroscedastic. (Error term does not have constant variance)

Breusch-Pagan-Godfrey Test is used to test for heteroscedasticity problem. The probability value to be used here is the "Obs*R-squared" p-value (presented by Prob. Chi-Square(9)) which is 0.0123 in Model 1 while in the Model 2 the Prob. Chi-Square(5) is 0.0734. Therefore we fail to reject the null hypothesis for model 1 at 5% significance level and this sample indicates that the error terms is homoscedastic. This mean the error term do have constant variance.

3.9.1   TESTS ON FUNCTIONAL FORM

Ramsey RESET Test
Equation: UNTITLED
Specification: HDD C HHI HPI BLR
Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	2.274878	63	0.0263
F-statistic	5.175070	(1, 63)	0.0263
Likelihood ratio	5.368208	1	0.0205

F-test summary:

	Sum of Sq.	Df	Mean Squares
Test SSR	50.22996	1	50.22996
Restricted SSR	661.7169	64	10.33933
Unrestricted SSR	611.4869	63	9.706141
Unrestricted SSR	611.4869	63	9.706141

LR test summary:

	Value	Df
Restricted LogL	-173.8490	64
Unrestricted LogL	-171.1649	63

Unrestricted Test Equation:
Dependent Variable: HDD
Method: Least Squares
Date: 06/14/15   Time: 17:25
Sample: 1 68
Included observations: 68

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.89335	3.967321	2.997830	0.0039
HHI	-2.51E-05	3.60E-05	-0.696378	0.4888
HPI	0.543054	0.135059	4.020875	0.0002
BLR	-0.912774	0.350933	-2.600995	0.0116
FITTED^2	-0.033872	0.014889	-2.274878	0.0263

R-squared		0.677196	Mean dependent var	18.82012

Adjusted R-squared	0.656700	S.D. dependent var	5.317244
S.E. of regression	3.115468	Akaike info criterion	5.181322
Sum squared resid	611.4869	Schwarz criterion	5.344521
Log likelihood	-171.1649	Hannan-Quinn criter.	5.245986
F-statistic	33.04118	Durbin-Watson stat	0.767469
Prob(F-statistic)	0.000000		

H_0:   No misspecification
H_1:   Error in specification

Ramsey Regression Specification Error Test (RESET) is the test that is use here. The probability value to be used here is whether t-statistic, F-statistic or likelihood ratio. As observed the p-value for all three statistics are less than 5% for the models. Therefore we reject the null hypothesis at 5% which means that the model is error in specified.

SUMMARY

All the empirical results from this study have been shown clearly in this chapter. In this research, testing has closely followed the recommended steps in treating and analyzing multiple linear regressions. Based on the results, it showed that house price index have a positive significant relationship and lending rate have a negative significant relationship with the households debt. For the stationary test, the result shows that data is stationary since the null hypothesis is rejected. In accordance to testing a regression model with time series data, the data tested the regression model for econometric problems. The study found that other test has fulfils the underlying assumptions for the time series multiple linear regression model. The results obtained from this chapter will give a clear view for to make conclusion and recommendations.

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CHAPTER 5

DISCUSSION

4.0 Conclusion

This study investigated the impact of determinants Household Income, House Price Index, and Bank Lending Rate towards the Households Debt using quarterly data from Q1 1998 to Q4 2014. A Linear Multiple Regression was used to find out the relationship between them.

This research was conducted to discover the impact of determinants towards households debt in Malaysia. This study was using 5% significant level of relationship between dependent variable and independent variables.

From the findings above, we discovered that Households Income (HHI) was insignificant towards Households Debt(HDD) and have negative relationship (based on Regression Test). This is in line with (Nazreen A.Ghani, 2010) there is a negative relationship between household income and households debt in the selected country his using as sample where he said increase in income will increase the purchasing power and won't reduce the households debt.

The other result show that the independent variable (House Price Index and Bank Lending Rate) has significant towards households debt. The result of house price index in line with research done by Shahrezan, 2014 on his research on relationship between determinants that affected increasing of households debt in Malaysia that shows there is positive relationship between house price with household debt where if the house price become more high it will reflect to increase in debt ratio as they will borrow more to finance the purchasing.

The result from bank lending rate test shows that there is negative relationship with households debt where it was same as studies done by Maznita Mokhtar & Azman Ismail, 2013 where lower interest will lead to more borrowing loan and lead in increase in households debt.

4.1 Recommendation

For future studies, researcher should make an in-depth and extended analysis on the impact of determinants towards the households debt in Malaysia. To ensure the validity of the accuracy data, the researcher should extract the primary data from the authorized parties themselves rather than rely on the secondary data from Data Stream, Data World Bank and Bank Negara Malaysia because we do not know whether the data is correctly updated or not.

It is also recommended to have bigger samples of data for future study. Another method that researcher can use is Robust Standard Errors and Weighted Least Squares. Robust Standard Errors does not change the coefficient estimates, but will give reasonably accurate p-values while Weighted Least Squares help in corrective the problem of bias in standard errors and will give more efficient estimates but it is more difficult to implement as compared with Robust Standard Errors.

Last but not least, researcher may also focus on other macroeconomic variables as from the adjusted R^2 where we can see only 63.43% of variation in households debt is explained by the chosen variable namely households income, house price index and bank lending rate and the remaining determine by other factor. This other factor should be highlight as we want to see overall factor that contributing to increase in household debt in Malaysia so we can overcome it by taking necessary action.

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