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## Household Debt and Macroeconomic Variables in Malaysia

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### Abstract

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The rise of household debt in Malaysia has caused consternation since it has almost reached 89.1% of total GDP. The level of household debt is deemed to be at worrying stage as it may trigger another financial crisis. The purpose of this study is to examine factors that influence household debt in Malaysia via time series data. This study employs the ordinary least square (OLS) method and the macroeconomic variables used consist of base lending rate, housing price index, gross domestic product and unemployment as independent variables taken in the period from quarter one 2008 to quarter four 2015. The results show that the housing price index is the most significant variable, followed by base lending rate, unemployment and gross domestic product. House pricing index and gross domestic product show positive relationships with household debt, which indicates that the rise of household debt is determined by the rise of these explanatory variables. However, base lending rate and unemployment are found to have negative effects on the rise of household debt. The data are taken from Bank Negara Malaysia report, National Property Information Centre (NAPIC) and Asia Regional Integration Centre.

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**Keywords:** Household Debt; Macroeconomic Variables; Malaysia.

## 1. Introduction

The rise of household debt in Malaysia has inflicted worry among households since it has almost reached 89.1% of total GDP in 2015. Household debt is the amount of money lent to borrowers for purchase of properties, personal use, securities, motor vehicles and credit cards (Malaysia Central Bank, 2013). The expansion of loans has led to the rise of household debt and it has been an increasing trend since the early 2000s. Malaysia is recorded as one of the highest in the Asian region with a household debt level of 89.1% in 2015. 56.2% of the loans were allocated for housing loans, making it the highest factor contributing towards the rise of household debt, followed by 15.5% for vehicle loans. This problem triggers another problem which is bankruptcy. According to Malaysia's Department of Insolvency (2016), 5,547 individuals under the age 35 were declared bankrupt in 2015, more than double in number in 2005. Most young borrowers are burdened with study loans after graduation. Once they start working, their need for transportation arises, thus giving rise to loans for vehicles.

Therefore, the purpose of this study is to examine the macroeconomic variables that affect the household debt in Malaysia. The objective is to examine the impact of base lending rate, house price index, gross domestic product, and unemployment on household debt. The result shows that house price index and gross domestic product have positive relationships with household debt. While, unemployment and base lending rate are found to have negative effects on household debt. This study using 32 observations which covers for eight years from the year 2008 to 2015 on quarterly basis.

## 2. Literature review

### 2.1 Concept of household debt

The rise of household debt has created worry to the government and household sector. This issue has attracted the attention of economists to study and investigate the factors and impact of household debt on economic and social factors. According to Debelle (2004), housing loans is the leading factor that contributes towards the increase of household debt. Jacobsen (2004) investigated the effects of various factors on household debt in Norway and found that housing stock, interest rates, number of house sales, wage income, housing prices and unemployment rates have significant impact towards the rise of household debt. Besides that, Rahman & Masih (2014) examined the relationship between household debt and GDP, interest rates and housing price and discovered that there are significant relationships between household debt and the independent variables in the long run. Endut & Hua (2009) investigated the trends of household debt, factors contributing to issue, and composition and implication of monetary policy and financial stability. Unfortunately, the authors' explanations are not rooted in empirical analysis.

### 2.2 Concept of base lending rate with household debt

Meng, Hoang & Siriwardana (2011) found that there is a negative relationship between household debt and interest rates. Household debt may slow down with increases in interest rate. However, when household debt reaches a very high level, an increase in the interest rate may increase households'

repayment burden and induce a credit crisis. This result is in line with Nieto's (2007) findings. The result showed that developments in the short run are influenced by changes in long term interest rates, and declines in interest rates explain the expansion of households' borrowed funds. Turk (2015) stated that declining interest rates also explain the rise of household debt in Sweden. This result is supported by Mutezo (2015) who revealed evidence of the existence of a long run relationship between household debt and interest rates. The researcher stated that low interest rates have supported household consumption expenditure, thus causing high household indebtedness.

In addition, Crawford and Faruqi (2011) revealed that low interest rates have contributed to the growth of household debt. Low interest rates have also contributed towards the increase in home ownership rates and mortgage debt. Jacobsen & Naug (2004) showed that high debt growth is related to declining interest rates. This result is supported by Debelle (2014) who stated that lower interest rates have led to substantial increases in household debt. A decline in nominal interest rates will allow an increase in the maximum amount a financial institution will lend to households. The author also found that financial deregulation decreases credit rationing and lowers interest rates. Anderson, Bunn, Pugh and Uluc (2014) revealed that higher interest rates will increase financial pressure on households with high levels of debt. It will make the borrowers worse off and savers better off. According to a research done by Martins and Villanueva (2003), they found that an increase in interest rate of 1 per cent reduces the probability of borrowing by 2.9 per cent. Bank of Canada (2016) found that when interest rates fall, the demand for mortgage credit increases, stimulating both prices and household debt. According Endut & Hua (2009), a low interest rate environment has reduced the cost of borrowing and indirectly increased the incentive for households to borrow in order to smooth their desired path of consumption over their life cycle.

However, Hoang & Meng (2015) revealed contradicting results with the previous researcher, as they stated that interest rate is the main factor that influences household debt. Hoang & Meng (2015) found that an appreciation in interest rate will only reduce a small amount of household debt. This result is supported by Pearce (1985) who found that without deposit and loan rate ceilings, increases in interest rates have less effect on credit flows because they are not accompanied by tighter credit standards.

Other researchers have found that there is an insignificant relationship occurring between base lending rate and household debt. For example, Rahman & Masih's (2014) result showed that the relationship between household debt and lending rate remains endogenous. This result is supported by Meniago, Petersen, Petersen and Mah (2013) who found that the lending rate is insignificant towards rising household debts.

### *2.3 Concept of house price index with household debt*

Observations from Oikarinen (2009) found that there is a strong two-way interaction between housing prices and housing loans. The interaction is likely to augment boom business cycles in the economy and increase the fragility of the financial sector. Housing price movements appear to have a

notable positive impact on consumptions loans and it is found that housing markets affect macroeconomic cycles. This is in line with Nizar's (2015) findings that housing prices are significant, thus the increase in housing prices will further increase debt. Another study done by Turk (2015) found that growth in housing prices will moderate to be broadly in line with household debt growth. This result is supported by Jacobsen & Naug (2004) who found that household debt may increase further because higher house prices may result in higher final wealth and better borrowing conditions. Thus, households will have greater incentive to raise loans secured by collateral to finance consumption and investment. According to research done by Rahman & Masih (2014), they found that house prices are the leading factor that increases household debt in the long-run. Bank of Canada (2016) revealed that there is a positive relationship between household debt and house prices.

Another study conducted by Meniago, Petersen, Petersen and Mah (2013) revealed a significant positive response from household debt to a shock from house prices. However, research done by Gerlach & Peng (2004) found that property prices are weakly exogenous. Moreover, it shows that property prices determine bank lending, but bank lending does not appear to influence property prices. This is in line with Hoang & Meng's (2015) findings that there is a negative relationship between household debt and house prices. As mortgage debt is a major debt in household, people will delay their decision to buy residential houses as house prices have increased. They will defer their purchasing or in other words, postpone their intention to take loans until prices are stable. This is in line with the findings of Meniago, Petersen, Petersen and Mongale (2013) who found that house prices have positively contributed to a rise in household debt. However, the relationship is statistically insignificant between the variables.

#### *2.4 Concept of gross domestic product with household debt*

Research done by Nizar (2015) revealed that GDP is related with household debt, either in the short run or long run relationship. The researcher found that positive economic growth is reflected by higher GDP, thus households earn higher income which encourages banks to issue more debt. Meniago, Petersen, Petersen and Mongale (2013) revealed that there is a significant and positive relationship between household debt to gross domestic product. When GDP increases, this will encourage households to borrow more and in response, caused the household debt to increase. The theory supports the theory that higher GDP implies higher economic growth, followed by higher income, which means that households and creditors will feel confident in taking and issuing more debt. These results are supported by Meniago, Petersen, Petersen and Mah (2013) who found that GDP has contributed significantly to changes in household debt levels in South Africa. This justifies the theory that higher GDP indicates strong economic growth and higher income. Rahman & Masih (2014) found that any changes in GDP may not affect household debts. Although the result found that GDP is endogenous, the authors believe that GDP as a proxy of income may play a vital role in the development of household debt in Malaysia.

### 2.5 Concept of unemployment with household debt

Hoang & Meng (2015) found that the rise of Australian household debt in the last two decades is mainly responsible for the reduction of unemployment rate. The result is supported by DeBelle (2014) who revealed that the largest and most significant negative shock to household income is unemployment. Defaults on payments will occur as borrowers will find it difficult to maintain their mortgage payments through periods of unemployment. Nieto (2007) revealed that unemployment has a negatively significant relationship in the short term. Households tend to increase borrowing when faced with increases in spending or situations of low unemployment. Jauch & Watzka (2013) found that approximately one third of the aggregate rise in unemployment in Spain can be traced back to high household debt levels. Another studies conducted by Hamid, Sarmidi and Nor (2015) found that unemployment will create uncertainty in workforce market and prevent households from borrowing money. Financial institutions will also avoid issuing debt. A high unemployment rate means there is less income for all households and thus a greater desire for loans to finance consumption. Thus, it leads to a rise in household debt (Hoang, Meng & Siriwardana, 2011). There are two implications of unemployment which are that it will increase the possibility of financial constraints and discourage households from borrowing because the households might be unable to repay loans.

## 3. Research design

In this section, the discussion will focus on the estimation model used for the selected macroeconomic variables and household debt. The dependent variable is represented by household debt in Malaysia. The independent variables consist of base lending rate, house price index, gross domestic product and unemployment. A multiple regression analysis is employed to estimate the ordinary least square (OLS) analysis in the period from quarter one 2008 to quarter four 2015. This study using 32 observations which covers for eight years from the year 2008 to 2015 on quarterly basis data. The OLS method is a procedure to determine the best fit line to data (Miller, 2006).

### 3.1 The model

The basic variables follow Rahman & Masih (2014) and Hoang, Meng & Siriwardana (2011). The regression model for household debt and macroeconomic variables can be written as follows:

$$HD_t = \alpha_t + \beta_1 BLR_t + \beta_2 HP_t + \beta_3 GDP_t + \beta_4 UN_t + e_t$$

Where HD refers to household debt, BLR refers to base lending rate, HPI refers to house price index, GDP refers to gross domestic product and UN refers to unemployment. These variables are selected from macroeconomics factors that can influence the potential of household debt in Malaysia (Rahman & Masih, 2014).

### 3.2 Data description

Data were extracted from various sources. The household debt is obtained from a monthly statistical bulletin and it is measured by the Central Bank in Ringgit Malaysia (million). It is the loan disbursed by financial institutions including commercial banks and Islamic banks to borrowers. The loans categorized under household debt are loans disbursed for the purpose of purchasing securities, transport vehicles, residential property, personal use, credit cards and durable consumer goods. House price data were retrieved from the National Property Information Centre (NAPIC) using the base year 2000, while the interest rates used for this study is base lending rate charged by commercial banks and Islamic banks. Gross domestic product growth is retrieved from the Asia Regional Integration Centre and measured in percentage units. Unemployment variable is taken from a monthly statistical bulletin provided by Central Bank of Malaysia. It is measured in the percentage of labour force.

## 4. Analysis and Findings

From the correlation table (Table 1), it shows that the household debt has a positive relationship with all the independent variables except for unemployment. The result also revealed that none of the variables show serious multicollinearity problems in this study. Generally, correlation among independent variables is not a serious problem as the result shown is less than 0.8. The house price index shows a high correlation with household debt as the correlation is more than 0.8. Both base lending rate and unemployment were found to have a moderate correlation with household debt at 0.51 and 0.66 respectively.

**Table 1.** Correlation between household debt and macroeconomic variables

	HD	BLR	HPI	GDP	UN
HD	1				
BLR	0.514365	1			
HPI	0.911451	0.61477	1		
GDP	0.348123	0.495975	0.241201	1	
UN	-0.664036	-0.686501	-0.581667	-0.458366	1

The house price index, base lending rate and unemployment can influence household debt. Meanwhile, gross domestic product may not have a large influence on household debt as it shows a weak correlation with household debt.

**Table 2.** Regression results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HPI	323.9403	28.86172	11.22387	0
GDP	609.4033	279.3487	2.181515	0.038
BLR	-9460.577	2855.49	-3.313118	0.0026
UN	-12671.56	3970.048	-3.19179	0.0036
C	119365.7	25851.82	4.617303	0.0001

R-squared	0.902606	Durbin-Watson stat	1.401963
Adjusted R-squared	0.888177		
F-statistic	62.55603		
Prob(F-statistic)	0		

Based on the results (Table 2), all variables have shown significant relationships with household debt. House price index and gross domestic product have positive and significant relationships with household debt, while base lending rate and unemployment have negative relationships with household debt. Base lending rate, house price index and unemployment are found to be significant at 1% respectively. The gross domestic product is significant at the 5% level. The F-test result shows significance at the 1% level, which means at least one of the independent variable has an influence on household debt. Besides that, the coefficient of determination ( $R^2$ ) shows that 90.26 % of the total variation in the dependent variable (household debt) can be explained by all the independent variables which are base lending rate, house price index, gross domestic product and unemployment.

As the base lending rate increases by 1%, household debt will decrease by RM 9460.577. This shows that there is a negative relationship between base lending rate and household debt in Malaysia. According to Hoang, Meng & Siriwardana (2011), the valid reason for this is that a rise of interest rates will also increase the cost of borrowing. Thus, households will postpone their intent to borrow or at least reduce the amount of money they intend to borrow. This will reduce the liability that they need to pay monthly to the financial institution. Other than that, the hiking of interest rate will affect households who have already incurred debt. Their liability to pay will rise and their repayment burden will increase if the debt is based on interest rates. The rise of interest rates will also discourage investments. The whole economy will slow down due to the reduction of investment. It may reduce households' income, increase unemployment and reduce household borrowing. The household debt level will decrease if potential borrowers incur less debt than the amount of their scheduled repayments. This finding is in line with Endut & Hua (2009), who showed that a low interest rate environment reduces the cost of borrowing and increases the incentive for households to borrow in order to smooth their desired path of consumption over their life cycle. The increasing of credit cards usage due to the innovation of product by financial institutions to attract more consumers to make loans. Factors such as low interest rates, low inflation rate, and financial deregulations led to the rise in household debt.

As the house price index increases by 1%, household debt will increase by RM 323.9403. An increase in house price means an increase in housing assets. For new home buyers, they have to take more debt in purchasing a house. For those who have already taken housing loans, it is a good opportunity to withdraw housing equity. As a result, household debt will increase along with housing prices. This is in line with the findings of Rahman and Masih (2014) who studied the relationship between household debt and house prices. The result revealed that the relationship is statistically significant. It implies that house prices are the leading factor and an increase in house prices in the long run will increase household debt. The result was supported by Nizar (2015) who investigated the

determinants of Malaysian household debt from a macroeconomic perspective. The researcher found that housing prices is significant, thus an increase in housing price will further increase debt.

Gross domestic product has a positive significant relationship with household debt. With an increase of gross domestic product by 1%, household debt will increase by RM 609.4033. An increase in gross domestic product means an expansion in economic growth. It also indicates a rise in household income. It widens the opportunity for households to borrow money as they can gain banks' confidence to lend money. Steady economic growth makes people more confident to borrow to and lend money from financial institutions. Household debt may grow if the demand to borrow and willingness to supply money increases in line with the rise in gross domestic product. Rahman & Masih (2014) found that any changes in GDP may not affect household debts. Although the result found that GDP is endogenous, the authors believe that GDP as a proxy of income may play a vital role in the development of household debt in Malaysia. However, the researchers still believe that lending rates act as official instruments that control the amount of credit extended to the private sector. Thus, care should be taken to avoid large economic shocks since shocks on the lending rate may influence household debt income and directly impact the repayment of debts in the household sector.

Unemployment has a negative and significant relationship with household debt. The findings revealed that with an increase of unemployment by 1%, household debt will decrease by RM 12671.56. A high unemployment rate indicates that households will lose their source of income. Households will need money for consumption or savings, thus the desire to take loans will also rise to finance their expenses. However, potential borrowers will be discouraged from borrowing money as they worry about their ability to repay the liability to the financial institutions or lender. This reason will restraint households from borrowing money, thus the demand for loans will decline. Other than that, an increase in unemployment indicates unsteady economic conditions. Investors will be hesitant to invest in our economy and be cautious to lend. From this point of view, household debt will shrink. This finding is in line with Hamid, Sarmidi and Nor (2015) who found that unemployment has a negative and significant relationship with household debt. Unemployment will create uncertainty in the workforce market and prevent households from borrowing money. Financial institutions will also avoid issuing debt to prevent the risk of non-performing loans by households.

All of the variables were found to be important in explaining household debt in Malaysia. House price index and gross domestic product have positive and significant relationships with household debt, while base lending rate and unemployment were found to have negative and significant relationships with household debt.

## **5. Conclusions and Recommendations**

The objective of this study is to examine macroeconomic variables that influence household debt in Malaysia via time series data by utilizing Malaysian macroeconomic variables' data and household debt data from quarter one 2008 until quarter four 2015. The macroeconomic variables used are base



lending rate, housing price index, gross domestic product and unemployment. The finding revealed that all of the explanatory variables have significant impact on household debt in Malaysia. House pricing index has a positive relationship with household debt. It shows that house prices is the leading factor that contributes to the increase of household debt in the long run. Base lending rate is negatively related to household debt. It implies that a low interest rate environment reduces the cost of borrowing, thus indirectly increases the incentive for households to borrow. Unemployment also has a negative relationship with household debt, implying that defaults on payments will occur as borrowers will find it difficult to maintain their mortgage payments during periods of unemployment.

An abundance of credit supply caused by low interest rates leads to this problem. The amount of loans extended to the household sector is controlled by lending rates. Thus, the government should monitor the trend of lending rates to avoid large economic shocks since it may influence household debt incomes and directly impact the repayment of debts from the household sector. The government should also frequently supervise the housing market since most households take loan to purchase houses. Other than that, the government should also be strict when issuing new homes to households. Creditors should examine closely the credit conditions of households and only those with good credit conditions should be deemed competent to take housing loans. A higher gross domestic product indicates higher economic growth and implies that households gain higher income. Higher income gives opportunity to households to borrow money and confidence to the creditors to issue debt. However, the benefits of economic growth are not well distributed among households due to the existence of income inequality. Thus, the government should try to reduce this problem so that all households could enjoy the benefits of economic growth. Household debt can be reduced if the government creates more jobs in the economy, thus bringing more income into the household sector and consequently reducing debt among households.

Other variables should be taken into consideration for future research, for example consumer price index, savings and real income as these variables can explain more comprehensive relationship between household debt and the macroeconomic variables. Future researchers also are advised to use a longer time period (number of observations) for the study. The time frame may influence the result of the study since the longer the period taken to carry out a study, the more accurate the results that will be revealed.

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