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## MACROECONOMIC DETERMINANTS OF HOUSING LOAN IN MALAYSIA

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## *Abstract*

This study investigates the dynamic relationships amongst the total of housing loan and macroeconomic variables (inflation, interest rate, and Growth Domestic Product) in Malaysia. A sample of this study are time-series data, which covered the period from 1991 to 2014 (23 years) from Department Statistics and Bank Negara. This paper analysed by using correlation and regression in SPSS. There are two (2) methods of analysis are picked to evaluate the results, consists of correlation model and regression model. The empirical results show that only inflation, interest rate, and GDP have negative significant impact with increasing of total housing loan while unemployment rate are not significant impact with the increasing of total housing loan. The correlation results show the inflation rate, interest rate, and GDP are having a strong relationship with total of housing loan. As a conclusion, only three (3) out of four (4) macroeconomic indicator are having a relationship with the housing loan and the strongest relationship is inflation and interest rate. As the result which inflation rate, interest rate and GDP have a significant relationship towards total housing loans, the company and government can predict and making decision about loan approval in construction sector

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**Keywords:** Housing Loan, inflation, interest rate, GDP, unemployment rate.

## 1. Introduction

Housing loan that been offered by a financial intermediaries such as banks, government society, and so along. Housing loan also can be seen as a totality of money that has been borrowed from a financial establishment in order to buy homes. Housing loan consists of adjustable or fixed interest rate in payment term. There have some factors that need to be considered by the financial institutions in order to approve a housing loan because to avoid default payment. For example, income.

More often than not, a person considered many factors in order to decide to purchase a home such as the income that they earn, loan interest rate, inflation, and etc. The general level of prices for goods and services is rising (inflation), and, later, the buying power is passing. The person who not employed will affect their income. Thus, will bear upon the demand of goods and products and from that it will chew over the inflation rate. By that, unemployment might help in providing better findings towards this field.

According (Yuval, Peter, & Jan, 2012), they found that relationship between home ownership and unemployment levels is inverse in cross-section and GDP significance of the relationship is small. Prior literatures (e.g. Oliver, 2010; Sabri, 2005; Theodore, 2015) found that significant relationship between interest rate and housing loan. Investigated a significant multidirectional link between house prices, and GDP and inflation. Furthermore, Ong (2013) found that GDP a significant and strongest relationship with the house price index not inflation.
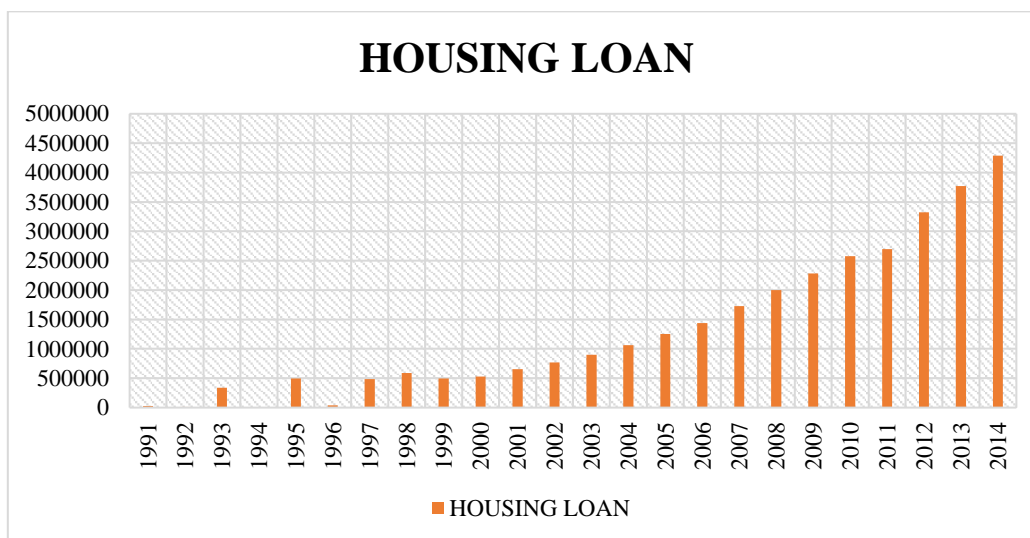
## 2. Problem Statement



**Figure 01.** Total Of Housing Loan

Based on the figure 01, the result has shown that the total housing loan is keeping increasing from twenty three (23) years ago. It started from 1991until 2014. This research has been done in order to know what are the factor that affecting or influencing the increasing of total housing loan? Today, housing loan is very important because for those who are affording to buy at least one home are feeling very blessed and fortunate because we must know that not all of us are affording to purchase homes without realizing a house loan. The housing loan trend is increasing after 1997(economic crisis) and maybe related to macroeconomic variables which is inflation rate, interest rate, unemployment rate and Gross Domestic Product (GDP).

## 3. Research Questions

How does inflation, interest rate, unemployment and GDP influence the amount of housing loan that will be made in a year?

## 4. Purpose of the Study

The study might improve a knowledge on housing loan and the economics factor influenced the total amount of housing loan increased or decreased.

## 5. Research Methods

A sample of this study are time-series data, which covered the period from 1991 to 2014 and sources of data from Department Statistics and Bank Negara.

Regression analysis is given of the following examples

$Y = a + B1\ X_1 + B2\ X_2 + B3X_3 + B4\ X_4 + e$

Whereby;

Y = total of housing loan (Dependent data)

a = constant

B1 = inflation (Independent data)

B2 = interest rate (Independent data)

B3 = GDP (Independent data)

B4 = unemployment rate (Independent data)

e = error

## 6. Findings

The table below shows a Variance Inflation Factor (VIF) test. VIF measure how much the variance of the estimated regression coefficients is inflated as compared to when the predictor variables are not linearly related. It is practiced to identify how much multicollinearity (correlation between predictors) exists in regression analysis. Multicollinearity is problematic because it can increase the variation of the regression coefficients, making them unstable and hard to understand.

**Table 01.** VIF TEST

| Collinearity Statistics | |
|---|---|
| Tolerance | VIF |
| .964 | 1.037 |
| .949 | 1.053 |
| .970 | 1.031 |
| .968 | 1.033 |

**Table 02.** Correlation

| | | LHL | INF | IR | UR | GDP |
|---|---|---|---|---|---|---|
| Pearson Correlation | LHL | 1.000 | -.439 | -.372 | .003 | -.369 |
| | INFLATION | -.439 | 1.000 | -.171 | -.095 | .018 |
| | IR | -.372 | -.171 | 1.000 | .099 | -.134 |
| | UR | .003 | -.095 | .099 | 1.000 | -.131 |
| | GDP | -.369 | .018 | -.134 | -.131 | 1.000 |
| Sig. (1-tailed) | LHL | . | .018 | .040 | .495 | .042 |
| | INFLATION | .018 | . | .218 | .334 | .468 |
| | IR | .040 | .218 | . | .327 | .272 |
| | UR | .495 | .334 | .327 | . | .275 |
| | GDP | .042 | .468 | .272 | .275 | . |
| N | LHL | 23 | 23 | 23 | 23 | 23 |
| | INFLATION | 23 | 23 | 23 | 23 | 23 |
| | IR | 23 | 23 | 23 | 23 | 23 |
| | UR | 23 | 23 | 23 | 23 | 23 |
| | GDP | 23 | 23 | 23 | 23 | 23 |

Inflation rate and housing loan have a negatively correlated relationship with a magnitude -43.9%, accepted at the 5% level of significant. Interest rate and housing loan have a negatively correlated relationship with a magnitude -37.2%, accepted at the 5% level of significant. Unemployment rate and housing loan have a positively correlated relationship with a magnitude 0.3%, accepted at the 1% level of significant. GDP and housing loan have a negatively correlated relationship with a magnitude -36.9%, accepted at the 5% level of significant.

**Table 03**. Regression analysis for macroeconomic variables and housing loan

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | 7.642 | .999 | | 7.646 | .000 | | |
| | INF | -.262 | .078 | -.524 | -3.375 | .003 | .964 | 1.037 |
| | IR | -.090 | .027 | -.515 | -3.290 | .004 | .949 | 1.053 |
| | UR | -.096 | .280 | -.053 | -.343 | .736 | .970 | 1.031 |
| | GDP | -.074 | .026 | -.435 | -2.810 | .012 | .968 | 1.033 |

a. Dependent Variable: LHL

REGRESSION MODEL

$$Y (LHL) = \beta_0 - \beta_1 INF - \beta_2 IR - \beta_3 UR - \beta_4 GDP + \epsilon$$

Y = Total of Housing Loan

B0 = Constant Parameter

INF = Inflation

IR = Interest Rate

UR = Unemployment Rate

GDP = Gross Domestic Product

$\epsilon$ = Error Term

$$Y \text{ (LHL)} = 7.642 - 0.262 \text{ INF} - 0.090 \text{ IR} - 0.096 \text{ UR} - 0.074 \text{ GDP} + \epsilon$$

Model shows that all the independent variables which is inflation rate, interest rate, GDP, and the unemployment rate has a negative result on housing loan as the estimated correlations is negative. In other words, if housing loan increase by 1 unit, then inflation rate also decrease by 0.262 units, interest rate will decrease on 0.090 units, while GDP will decrease 0.074 units and for the GDP, it will decrease 0.096 units and vice versa depends on the estimated coefficient value. This makes a negative reflects to housing loan.

Based on the probability value, inflation rate has a significant value because the probability value is less than the significant value of 5%. The probability value of inflation rate respectively is 0.003, which is lower than 5%. Furthermore, it indicates that there is a negative impact between inflation rates towards housing loan. (Chong, 2007)

It also same with the other independent variables which is interest rate and GDP because the probability value of these variable are 0.004 and 0.012 which is lower than 5% and 1%. However, it still shows that there have a negative impact between interest rate and GDP towards housing loan. For unemployment rate, the probability value is more than a significant value of 1%. It indicates that do not significant and have a negative impact toward housing loan. (Ni, Shuen Shi, & Wen, 2011)

**Table 04.** Regression analysis (model summary) for macroeconomic variables and housing loan

| R | R Square | Adjusted R Square | Standard error of the estimate | Change Statistics | |
|---|---|---|---|---|---|
| | | | | F Change | Sig. F Change |
| .763[a] | .582 | .489 | .48196 | 6.261 | .002 |

a. Predictors: (Constant), GDP, INFLATION, UR, IR

Table 04 shows that these variables significantly explain at 48.9 percent of the variance in housing loan with a standard error 0.48196 percent. It is implying collectively that the determining variables have a significant effect on increasing of total housing loan.

The result also indicates that in the correlation result, there are few variables only does have a relationship, in overall the significant level in regression shows the total impact of the variables, which make the total housing loan, is strongly affected.

**Table 05.** Anova

| | | Sum of Squares | df | Mean Square | F | Significance |
|---|---|---|---|---|---|---|
| | Regression | 5.817 | 4 | 1.454 | 6.261 | .002[b] |
| | Residual | 4.181 | 18 | .232 | | |
| | Total | 9.998 | 22 | | | |

a. Dependent Variable: LHL

b. Predictors: (Constant), GDP, INFLATION, UR, IR

In the table 05, it shows that the independent variables significant value at 0.002 percent, where it indicates that the variables are influencing the housing loan. The significant level shows that the independent influence the first year of data that is been collected.

The correlation results show the inflation rate, interest rate, and GDP are having a strong relationship with total of housing loan. The mean square of the regression is 1.454 and the F-value showing at 6.261 percent. This both value showing the relatively a strong significant among the variables.

## 7. Conclusion

Based on this research, there is some recommendation that could be made for the use for future. As the result which inflation rate, interest rate and GDP have a significant relationship towards total housing loans, the company can use this study to make their business plan and activities.

Other than that, the government also perhaps can use this study to help government making decision process. It might work as references for the government and it might work as the key indicator for the construction sector. Malaysian government needs to interrupt and give advice to the construction company in their business activities

**Table 06.** Summary of Results of relationship between macroeconomic variables with the increasing of total housing loan

| Variables | Result | Supported Journal |
|---|---|---|
| **Inflation rate** | Significant relationship with housing loan | (Rizvi, Malik, & Khan, 2015) |
| **Interest rate** | Significant relationship with housing loan | (Oliver L, 2010), (Sabri, 2005) and (Theodore, 2015) |
| **GDP** | Significant relationship with housing loan | (Ong, 2013) and (Guo & Wu, 2013) |
| **Unemployment rate** | No significant relationship with housing loan | (Yuval, Peter, & Jan, 2012) and (Ni, Shuen Shi, & Wen, 2011) |

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