UNIVERSITI TEKNOLOGI MARA

Voice of Academia

Academic Series of Universiti Teknologi MARA Kedah

VoA
2023
Volume 19 Issue II

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e-ISSN: 2682-7840

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Academic Series of Universiti Teknologi MARA Kedah

Voice of Academia
e-ISSN: 2682-7840

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INVESTIGATING THE MACROECONOMIC DETERMINANTS OF HOUSING PRICE INDEX (HPI) IN MALAYSIA

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ARTICLE INFO

Article history:

Received Feb 2022
Accepted April 2023
Published June 2023

Keywords:
Housing price index, Gross Domestic Product, Lending rate, Inflation rate, Unemployment rate.

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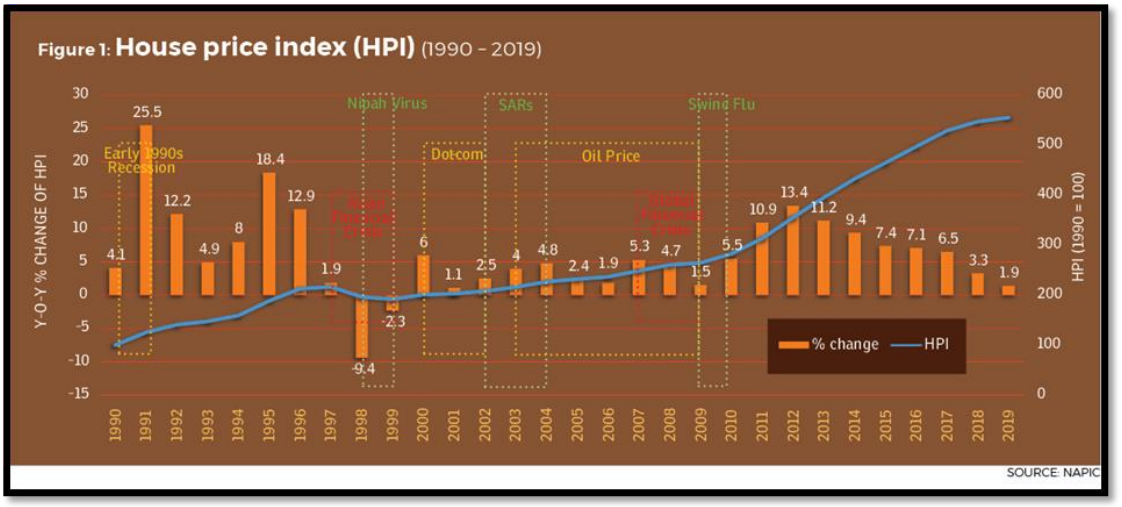
ABSTRACT

This research aims at identifying the macroeconomic factors that influence housing prices in Malaysia from 2001 to 2020, consisting of 20 observations. Nowadays, the cost of housing in Malaysia has steadily increased, negatively affecting households. It has generated plenty of issues for the country, especially in its economic development. As a result, this study aims at examining the relationship between the housing price index and macroeconomic variables that influence housing prices. The macroeconomic variables chosen are gross domestic product (GDP), lending rate (LR), inflation rate (IR), and unemployment rate (UR) in Malaysia. The regression analysis method is applied in this study to capture the effect of independent variables. This study concludes that the lending and unemployment rates are significant for the Malaysian housing price index. In contrast, the gross domestic product (GDP) and the inflation rate are not substantial with the housing price index in Malaysia. Although the lending and unemployment rates were significant, these independent variables negatively correlated with the house price index. The findings help the government, investors, policymakers, housing developers, and home buyers understand the influencing factors behind changes in house prices.

1. Introduction

Malaysia's property price index is expected to be the 29th highest among 40 Asian countries in 2020, according to the World Bank (Numbeo, 2020). As a result of the COVID-19 pandemic, the demand for property has been restricted, placing downward pressure on housing prices. According to the Valuation and Property Services Department (JPPH), Malaysia's house price index rose 0.3% in the first quarter of 2021, compared to 1.9% in 2020, according to the same department. Prices increased by an average of 7.5% annually between 2010 and 2019. Furthermore, due to Malaysia's rapid economic expansion, there has been an increase in demand for residential accommodation in the country's metropolitan areas (Ong, 2013). A direct outcome of this has been a massive spike in the price of residential real estate over the past ten years.

Having a home is essential for every human being since housing is a fundamental requirement that may serve as a haven for people to live in and provide them with safety. However, the most significant problem for households when deciding to purchase a house is the fluctuation in housing prices (Nurul Azam Haron, 2013), as the housing prices index is comprised of indices of housing rent prices, real and nominal house prices, and ratios of price to rent and price to income, among other things. Studying this backdrop is important because it helps us understand how macroeconomic drivers like GDP, lending, inflation, and unemployment affect Malaysia's housing price level. In the eyes of consumers, investors, and policymakers, Malaysia's housing price level is critical. The reason is that changes in the price level can affect the efficiency and effectiveness of the Malaysian economy, investor decision-making, and household wealth (Sabrina Abdul Latif et al., 2020).



Source: National Property Information Centre (NAPIC)

Figure 1: Malaysia House Price Index and Year-on-Year Percentage Change

The Housing Price Index (HPI) in Malaysia has increased since 2001. From 2001 to 2009, the Malaysian house price index increased consistently; however, from 2010 to 2015, the Malaysian house price index increased significantly. However, due to the Global Financial Crisis in 2008, Malaysia's GDP fell from 3.32 percent (2008) to -2.52 percent (2009). Therefore, several businesses began to minimize costs by reducing labor working hours. Following then, the growth rate significantly increased by around 4.1 percent from the 2009 third quarter (1.5 percent) to the 2009 fourth quarter (5.6 percent). Furthermore, from the first quarter of 2010 to the first quarter of 2012, housing prices increased by an average of 8.83 percent yearly. This issue happened because Malaysia was still recuperating from the Global Financial Crisis. Between the first quarter of 2001 to the fourth quarter of 2015, the growth rate of the house price index was at its greatest, at 12.2 percent, and peaked in the fourth quarter of 2012 and the third quarter of 2013. After reaching a peak, the growth rate declined until the third quarter of 2016. In summary, due to the rising of Malaysian housing price index since 2001, it is critical for this study to identify and analyze the crucial factors of house prices in Malaysia. However, the government's efforts to boost the economy aren't entirely ineffective. To stop developers from overbuilding, the government has implemented several policies to prevent people from speculating and stop developers from overbuilding. Stamp duty on households worth more than MYR 1 million (US$ 238,578) has increased from 3% to 4%. The government also added a 5% real property gains tax (RPGT) to selling properties owned for six years or more. To deal with the effects of the pandemic on the housing market, however, these rules have been temporarily eased up (Guide, 2021).

Only 72.5% of Malaysian citizens own homes out of the entire population (Ismail, 2015). According to Sherilyn Goh (2015), Malaysia's youthful generation with low or medium incomes, which accounts for almost half the population, is currently unable to acquire a dream home. The statistic indicates that most of the young generation or recent graduates cannot purchase a house since housing prices have risen faster than their income levels. If we ignore the impact of rising house prices on macroeconomic indicators, several implications or problems may develop. The rise in housing prices can be seen as a severe problem with negative implications such as financial insolvency stress and reduced economic growth. Small fluctuations in housing prices significantly impact households looking to buy a home, as evidenced by the high percentage. Most purchasers are concerned that they will be unable to keep up with the rising house costs (Ong & Chang, 2013). Governments and policy analysts have identified a need for more sufficient and reasonably priced housing as a critical challenge facing the country. As a result of the quick rise in house and land prices, households with a medium income level are finding it difficult to purchase a home. Thus, the continual rise in house prices in Malaysia has sparked interest in this study, which aims to analyze and identify the significant factors affecting house prices. Hence, this research seeks to understand the relationship between macroeconomic variables: gross domestic product (GDP), lending rate, inflation rate, unemployment rate, and housing price index (HPI) in Malaysia.

2. Literature Review

2.1 Gross Domestic Product (GDP)

A country's gross domestic product (GDP) is the total value of all the finished goods and services made inside its borders during a specific period. It is a broad measure of the total amount of domestic production (Jason Fernando, 2021). The Gross Domestic Product (GDP) is a way to measure how well a country is doing economically. Hence, a nation's GDP significantly affects the government, policymakers, and people who buy and sell homes. The real GDP is considered the main macroeconomic driver of house prices for a long-term period.

Several studies have been conducted to find the relationship between the GDP and the housing price index. It was found that GDP affects Malaysia's housing price index (Ong, 2013). He mentioned that housing investment is part of the GDP and that the housing price index will increase when the GDP grows. This statement is supported by Faiz and Ridzuan (2020), whose findings showed that increased

expenditure on consumption also contributes to a rise in GDP, ultimately leading to an increase in house prices. Finally, Nurul Azam Haron (2013) found that GDP and the housing price index have a significant relationship. These researchers concluded that growth and GDP increases would simultaneously cause the housing price index (Wee et al., 1999). On the other hand, several studies found that GDP was not the determinant of the housing price index in Malaysia (Pillaiyan, 2015). This research was supported by other research that indicated that GDP and the housing price index in Malaysia have a non-significant relationship (Trofimov, 2018). The researcher said that if there is much economic growth for a long time, it can make people want to build more housing, leading to an oversupply. He said that in 2005, there were a lot of uncompleted properties in Peninsular Malaysia, with 755,000 units still yet to be sold. Based on the literature review made by past researchers, there were arguments from researchers on whether GDP is the primary determinant of the housing price index in Malaysia.

2.2 Lending Rate

The lending rate, or "base lending rate," is defined as the cost of a loan (Banton, 2021). It is often called the "interest rate," the amount lenders charge as a percentage of the amount loaned over a specified period. The changes in lending rates will have a direct impact on the housing market in Malaysia. Teck-Hong (2010) stated in his analysis that base lending rates are the best essential driver of residential housing activity in Malaysia.

Researchers in previous studies found a significant relationship between the lending rate and the residence price (Abdul Latif et al., 2020) and (Shi et al., 2014). This finding was further supported by Lee (2009) and Vries and Boelhouwer (2005). They agreed with this conclusion and stated that macroeconomic variables such as lending rates have a major influence and significant impact on property prices. This is because the lending rate is linked to the cost of the property, making it an essential factor to consider when purchasing a home (Wang & Zhang, 2014). However, in contrast, research by Pinjaman and Kogid (2020) stated that an insignificant relationship exists between housing prices and interest rates where the rise in the stated macroeconomic factor triggers a decline in house prices. In addition, several researchers, such as Holstein et al. (2013) and Choudhury (2014), supported this statement by concluding that mortgage and lending rates have a non-significant impact on the housing price index. As observed in this review, many experts expressed their opinions based on their findings on lending rates. Some researchers found different results on whether the lending rate has a significant relationship with the housing price index in Malaysia.

2.3 Inflation Rate

Inflation can be defined as a persistent rise in the economy's price level. Most products in the economy will increase in price during inflation, according to Tsatsaronis and Zhu (2004). Housing is generally seen as an excellent inflation hedge since house prices grow in synch with inflation. Somehow, housing prices are not affordable for the younger generation in Malaysia.

According to Hossain and Latif (2009), the inflation rate affects housing price volatility since it can potentially drive-up property prices over the long term. Furthermore, inflation may impact housing prices in Malaysia since it affects people's expenditures, resulting in lower demand for housing. Although some studies have discovered a significant relationship between housing prices and inflation rates, these two variables have a non-significant relationship. According to Hao Guo et al. (2015), rising house prices can drive inflation in the short run, while increasing housing prices can control inflation in the long run. In other words, the influence of inflation on housing prices is lower than that of housing prices on inflation, implying that housing prices can hedge inflation over time (Kuang & Liu, 2015). In conclusion, past researchers found different outcomes on whether the inflation rate is the primary macroeconomic determinant of the housing price index in Malaysia due to various points of view and sources of studies.

2.4 Unemployment Rate

The unemployment rate is the percentage of individuals actively looking for work. During an economic downturn, the unemployment rate will rise, lowering demand for residential construction because most people cannot afford a house. As a result, home prices have dropped (The Investopedia Team, 2021). The previous studies by Mrochko (2020) found a non-significant relationship between the unemployment rate and housing prices. This study was supported by Aspden (2012) and Abelson et al. (2005) that the unemployment rate is inversely associated with housing prices. When a country experiences economic troubles, such as unemployment, housing prices are expected to rise. In the long run, the housing market acts as an equilibrium price based on the 'supply and demand' method. When the economy is in a deep recession, housing prices fall due to credit constraints, causing the unemployment rate to rise.

Moreover, Gan and Zhang (2013) discovered a non-significant relationship between the unemployment rate and house prices. On the demand side, if unemployment is high, a household's inability to enter the housing market is a financial barrier because they cannot obtain a mortgage. As a result, the number of buyers may be reduced. However, in past studies by Xu and Tang (2014) using a cointegration vector, they found a significant connection between the unemployment rate and housing prices. Based on a survey of prior researcher investigations, most of the results revealed an inverse connection between the two factors. However, other researchers have claimed a significant relationship between the unemployment rate and housing prices. Nevertheless, the arguments on whether the unemployment rate has a significant relationship with the house price index still occur due to different outcomes of the final research and views conducted by previous researchers.

3. Methodology

3.1 Research Design

The study will make use of secondary data, which is information that has already been obtained from primary sources and made available to researchers to use in their studies. Secondary data would be applied in this research because, unlike preliminary data, it can be computed in units of measurement and produce quantifiable results. The study will use secondary data gathered from various sources, including Thomson Reuters DataStream, Statista, World Bank data, Trading Economics, Google Scholar, EViews, the Department of Statistics Malaysia (DOSM), and the International Monetary Fund (IMF).

3.2 Conceptual Framework

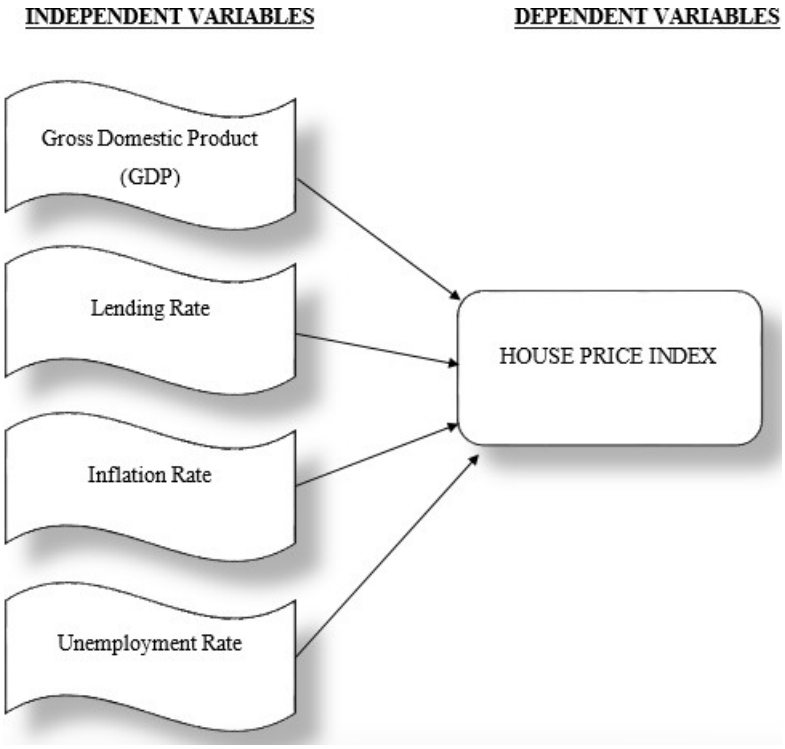


Figure 2: Theoretical Framework

3.2.1 Dependent Variable

A dependent variable (DV) is a variable that is influenced by the independent variables. The dependent variable is the outcome variable measured in each subject that independent variables have affected. In this research, the dependent variable is the housing price index in Malaysia.

3.2.2 Independent Variable

The independent variable (IV) modifies or adjusts the dependent variable and is assumed to influences dependent variables either in positive or negative correlation. Thus, it can be assumed that independent variance shall influenced the variance of dependent variables.

Table 1
Independent Variables

Independent Variables	Measurements	Abbreviation
Gross Domestic Product	$[(GDP_1 - GDP_0) / GDP_0] \times 100$	GDP
Lending rate	The weighted standard rate offered by commercial banks on all loans in national currency. The rate is weighted by loan amounts.	LR
Inflation rate	[(Consumer price $index_1$ - Consumer price $index_0$) / Consumer price $index_0$] x 100	IR
Unemployment Rate	(Unemployed people / Labor force) x 100	UR

3.3 Method of Data Analysis

3.3.1 Descriptive Analysis

The descriptive analysis examines what exists and attempts to prepare new ways of discovering facts. It entails acquiring data about products, people, individuals, events, and circumstances and organizing, tabulating, depicting, and describing the output. Descriptive analysis, also known as descriptive analytics or descriptive statistics, defines or summarizes data using statistical techniques. As one of the major types of data analysis, descriptive analysis is famous for extracting accessible insights from uninterpreted data. Descriptive statistics include types of variables as well as measures of distribution, central tendency, dispersion, and position. The data were described using the mean, median, standard deviation, variance, minimum and maximum variables, kurtosis, and skewness.

3.3.2 Correlation Analysis

A correlation is a statistical measurement of the relationship between two variables. Possible correlations range from +1 to –1. A zero correlation indicates that there is no relationship between the variables. Next, a –1 indicates a perfect negative correlation, meaning that as one variable goes up, the other goes down. A correlation of +1 indicates a perfect positive correlation, meaning that both variables move in the same direction (Kendra Cherry, 2021). A zero correlation suggests that the correlation statistic did not indicate a relationship between the two variables. A zero correlation is often demonstrated using the abbreviation r = 0.

3.3.3 Regression Analysis

According to Studenmund (2014), regression analysis is a quantitative approach that uses the quantification of a single equation to explain changes in one variable (dependent variable) as a function of changes in another set of variables (independent variable). It is essentially a quantification of economic theory to assess an entirely theoretical economic correlation.

4. Results

4.1 Descriptive Data Analysis

Date: 12/13/21 Time: 15:59
Sample: 2001 2020

	HOUSING_...	GDP	INFLATION...	LENDING_...	UNEMPLOY...
Mean	5.358500	4.336000	2.027765	5.374306	3.379000
Median	4.075000	5.310000	1.917613	4.965000	3.300000
Maximum	13.40000	7.420000	5.440782	7.125003	4.500000
Minimum	1.200000	-5.590000	-1.138702	3.944425	2.900000
Std. Dev.	3.467850	3.083715	1.419198	0.900601	0.337138
Skewness	0.833979	-2.143030	0.255455	0.400726	1.726493
Kurtosis	2.700874	6.894288	3.670065	1.862324	7.227795
Jarque-Bera	2.392966	27.94649	0.591680	1.613859	24.83114
Probability	0.302255	0.000001	0.743907	0.446226	0.000004
Sum	107.1700	86.72000	40.55531	107.4861	67.58000
Sum Sq. Dev.	228.4937	180.6767	38.26834	15.41055	2.159580
Observations	20	20	20	20	20

Figure 2: *Descriptive Analysis*

Notes: *The dependent variable is Housing Price Index. The independent variables are GDP, inflation rate, lending rate, and unemployment rate.*

Figure 2 shows the average or mean, median, maximum, minimum, standard deviation, skewness, and kurtosis for the gross domestic product (GDP), lending rate (LR), inflation rate (IR), and unemployment rate (UR). For the dependent variable, the maximum amount for housing price is 13.40000 and a minimum of 1.20000. The gap between the lowest and the highest HPI value is 12.20000. Also, it has a mean of 5.358500. In addition, the standard deviation for the housing price index is 3.467850, and the median for the housing price index is 4.075000. The data skewness for HPI is positive at 0.833979, suggesting that the tail on the right side of the curve is more extensive. The kurtosis for the variable is 2.700874, which means that it is larger than the normal distribution and the tail of the distribution is heavy with a high degree of a peak, known as leptokurtic kurtosis.

Moreover, for the first independent variable, Gross Domestic Product (GDP), the mean for this variable is 4.336000, which tells the average absolute distance of each data point in the set. GDP has the highest median value, 5.310000, compared to the other variables. Besides, the maximum value in the gross domestic product (GDP) data is 7.420000, while the minimum is -5.590000.

The mean for the inflation rate is 2.027765, and this is the lowest value mean among the rest of the variables. The inflation rate also has the lowest median value, 1.917613, compared to the other variables. The most significant figure for the inflation rate reported is 5.440782, while the lowest figure is -1.138702. The range for these two values is 6.579484. The inflation rate recorded 1.419198 as the standard deviation, the square root of variance. For the last independent variable of the unemployment rate, it is recorded that the mean value is 3.379000 while the median value for the data is 3.300000. Furthermore, the standard deviation, which is the square root of variance for the

unemployment rate, is 0.337138, the lowest standard deviation value among other variables. The leading figure in the data for the unemployment rate is 4.500000 while the minimum figure is 2.900000.

Overall, the highest value of the mean is from the lending rate variable, 5.374306, while the lowest value is from the inflation rate, which is 2.027765. In terms of median, GDP recorded the most significant number, 5.310000, and the inflation rate recorded the smallest number, 1.917613. The housing price index has the highest value in the data set, 13.40000, and the lowest value goes to GDP, which is -5.590000. The highest standard deviation is 3.467850 from the housing price index, and the lowest standard deviation is from the unemployment rate, which was recorded at 0.337138.

4.2 Correlation Data Analysis

Covariance Analysis: Ordinary
Date: 12/13/21 Time: 16:01
Sample: 2001 2020
Included observations: 20

Correlation t-Statistic Probability	HOUSING ...	GDP	INFLATION...	LENDING ...	UNEMPLOY...
HOUSING_PRICE_...	1.000000 ---- ----				
GDP	0.424360 1.988315 0.0622	1.000000 ---- ----			
INFLATION_RATE	0.283502 1.254256 0.2258	0.569850 2.942103 0.0087	1.000000 ---- ----		
LENDING_RATE	-0.473405 -2.280182 0.0350	0.227319 0.990359 0.3351	0.231562 1.009882 0.3259	1.000000 ---- ----	
UNEMPLOYMENT...	-0.678158 -3.914980 0.0010	-0.779759 -5.284057 0.0001	-0.571506 -2.954790 0.0085	0.017085 0.072496 0.9430	1.000000 ---- ----

Figure 3: *Correlation Data Analysis*

Notes: *The dependent variable is Housing Price Index. The independent variables are GDP, inflation rate, lending rate, and unemployment rate.*

Based on figure 3, there is a moderate uphill linear relationship (r = 0.424360) between housing price and GDP. For housing price and inflation rate, it indicates a weak uphill linear relationship (r = 0.283502). In contrast, the relationship between housing price and lending rate shows a different trend: a moderate downhill linear relationship (r = -0.473405). In terms of housing price and unemployment rate, they also offer a moderate downhill linear relationship (r = -0.678158) as the value is close to -1. This indicates that all these four-independent variables (GDP, inflation rate, lending rate, unemployment rate) influence the dependent variable (housing price index). In conclusion, the independent variables, which are the lending rate and unemployment rate, have a significant relationship with the housing price index due to its value that is less than the significant level of 0.05. The other variables, GDP and inflation rate, have an insignificant relationship with the housing price index because the p-value is more than 0.05. Furthermore, although the lending and unemployment rates have a significant level, it has a strong negative correlation with the dependent variable, which is the housing price index. On the other hand, although the GDP and inflation rate are insignificant, it has a strong positive correlation with the dependent variable, the housing price index.

4.3 Regression Data Analysis

Dependent Variable: HOUSING_PRICE_INDEX
Method: Least Squares
Date: 12/13/21 Time: 16:08
Sample: 2001 2020
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	37.52088	9.542236	3.932085	0.0013
GDP	0.020390	0.290195	0.070264	0.9449
INFLATION_RATE	0.024680	0.464671	0.053112	0.9583
LENDING_RATE	-1.804990	0.631676	-2.857462	0.0120
UNEMPLOYMENT_RATE	-6.688449	2.686565	-2.489591	0.0250

R-squared	0.673434	Mean dependent var	5.358500
Adjusted R-squared	0.586350	S.D. dependent var	3.467850
S.E. of regression	2.230370	Akaike info criterion	4.654530
Sum squared resid	74.61828	Schwarz criterion	4.903463
Log likelihood	-41.54530	Hannan-Quinn criter.	4.703125
F-statistic	7.733127	Durbin-Watson stat	1.045149
Prob(F-statistic)	0.001370		

Figure 4: *Regression Data Analysis*

Notes: *The dependent variable is Housing Price Index. The independent variables are GDP, inflation rate, lending rate, and unemployment rate.*

Regression evaluation is used to evaluate the relationship between two variables and to decide whether independent variables explain the effect of the dependent variable. The result of the regression analysis is shown in Figure 4. When analyzing the econometrics formula, the results obtained can be explained. The value used for the econometric equation is the value of the coefficient, so the econometric procedure is the following:

Housing Price Index = 37.5209 +0.0204 (GDP) +0.02469 (Inflation) + -1.8050 (Lending) + -6.6884 (Unemployment)

For each one-unit increase in Gross Domestics Product (GDP), the housing price index will increase by 0.0204 units withholding other independent variables constant. Furthermore, for each one-unit increase in the inflation rate, the housing price index will increase by 0.0247 units withholding other independent variables constant. In lending rate, the housing price index will be decreased by 1.8050 units withholding another independent variable constant. For the unemployment rate, the housing price index will be reduced by 6.6884 units withholding another independent variable constant. Analysis F-test is used to test the model's overall validity or to test whether any independent variable (explanatory variables) has a linear relationship with the dependent variable (response variable). According to the table above, the F-statistic is 0.001370. It is significantly based on the p-values, which are below 0.05. Hence, the linear model is overall valid. Furthermore, the R^2 0.6734 indicates the percentage of the variance in the dependent variable explained by the conflict in the independent variables. The R^2 of 67.34% shows that the dependent variable, the housing price index, influences the independent variables: Gross Domestics Product (GDP), Inflation rate, Lending rate, and Unemployment rate. The independent variables cannot explain the remaining 32.66%. This indicates that other independent variables are not included in this study and could further strengthen the regression equation. Moreover, the p-value of the F-statistic is 0.001370, used to test the overall significance of the regression model. Thus, researchers can reject the null hypothesis. On the other hand, the adjusted R^2 is 0.586350, which is smaller than the R^2. This indicates the variables in the regression model are robust fitting models and can be used to predict the housing price index (HPI).

GDP is the first independent variable. The table shows that the GDP coefficient is 0.020390, 2.039%, which means that inflation shows a positive correlation. The probability value is 0.9449, which is more than the significance level of 0.05. Thus, the null hypothesis should not be rejected since the p-value is insignificant with the dependent variables. The second independent variable is the inflation

rate. Based on the table, the coefficient of inflation value shows 0.024680, which is 2.468 percent. This means that inflation shows a positive correlation while the probability value is 0.9583, which is more than the significance level of 0.05. Thus, the null hypothesis should not be rejected since the p-value is insignificant with the dependent variables.

The third independent variable is the lending rate. Based on the table, the coefficient of lending value shows -1.804990, which is -180.499%. Therefore, it means that the lending rate shows a negative correlation. The probability value is 0.0120, less than the significance level of 0.05. Thus, the null hypothesis should be rejected since the value is significant for the dependent variables.

Lastly, there is the unemployment rate. Based on the table, the coefficient of unemployment is -6.688449. It means that income inequality shows a negative result. In comparison, the probability value is 0.0250, which means less than a significant level of 0.05. Thus, the null hypothesis should be rejected since the value is substantial for the dependent variables.

5. Discussion

In the result of the test carried out in the analysis, it can be concluded that only two of the independent variables are significant: the lending rate (LR) and unemployment rate (UR). In contrast, the gross domestic product (GDP) and inflation rate (IR) are insignificant.

5.1 Research Objective 1

The first independent variable is Gross Domestic Product (GDP). According to our studies, it was discovered that the independent variable, which is GDP has an insignificant relationship with the housing price index. Thus, this research supported study by Pillaiyan (2015) in her analysis by identifying real GDP was not the long-term driver of house prices. The housing price rate reacts conversely to the GDP rate; she justified that there is a real danger that the house prices are in a bubble as GDP was not identified as a driver of long-term house prices. In addition, the study conducted by Trofimov (2018) stated that GDP and housing prices were found to have a non-significant relationship and are not the main determinants of a house price index. Thus, we concluded that GDP has an insignificant relationship with the housing price index. This means that the null hypothesis had to be accepted for the independent variable of GDP, which is:

H_0: There is no significant relationship between GDP and the house price index in Malaysia,

5.2 Research Objective 2

The study found a significant relationship between the lending rate and the housing price index. It is proven by past research (Ok et al., 2019), which saw a positive correlation between real estate prices and lending rates in developed and developing countries. Besides that, Xu and Tang (2014) examined the determinates of UK house prices and found that the lending rate significantly impacts house prices. In addition, Lee (2009), Shi et al. (2014), and Vries & Boelhouwer (2005) also supported this conclusion and stated that macroeconomic variables such as lending rates have a significant influence on property prices. This is because the lending rate is linked to the cost of the property, making it an essential factor to consider when purchasing a home (Wang & Zhang, 2014). Finally, for our final research, we concluded that the lending rate has a significant relationship with the housing price index. Thus, the objective of identifying the relationship between the lending rate and housing prices was achieved and had to be supported by the hypothesis:

H_1: There is a significant relationship between the lending rate and the housing price index in Malaysia.

5.3 Research Objective 3

The third independent variable is the inflation rate. This research study shows that the inflation rate has an insignificant relationship with the dependent variable, which is the housing price index. Based on the past research by Hao Guo et al. (2015), these two variables react conversely to each other, showing an insignificant relationship using the theory that rising house prices drive inflation in the short run while rising housing prices can control inflation in the long run. In other words, the influence of

inflation on housing prices is lower than the effect of housing prices on inflation, implying that housing prices can hedge inflation over time (Kuang & Liu, 2015). By this, the objective of identifying the relationship between inflation rate and housing price index was achieved as a result of this research is also in line with and proven by past research, implying that the null hypothesis was supported. The hypothesis for the objective is as follows:

H_0: There is no significant relationship between the inflation rate and the housing price index in.

5.4 Research Objective 4

The study of this research shows that it has a significant relationship between the unemployment rate with housing prices. This finding is consistent with empirical findings from various journal articles, such as Xu & Tang (2014) found a significiant link between the unemployment rate and housing prices. The researchers stated, however, that the result is still rational in analyzing the UK property market because UK housing prices and unemployment rates are not associated. Other than that, Karamelikli et al. (2016) also stated that there is a significant relationship between the unemployment rate and housing prices. An increase in the unemployment rate affects the number of potential buyers and thus the demand for property investment. As a result, these signal effects may impact future house price predictions. Thus, the objective of identifying the relationship between the unemployment rate and housing prices was achieved and had to be supported by the hypothesis:

H_1: There is a significant relationship between the unemployment rate and the housing price index in Malaysia.

6. Conclusion

This research study focuses on finding and analyzing additional information on the macroeconomic determinants of housing prices in Malaysia. We can conclude that four major macroeconomic factors affect the housing price index in Malaysia: Gross Domestic Product (GDP), lending rate, inflation rate, and unemployment rate. Our analysis shows an insignificant effect of Gross Domestic Product (GDP) and inflation rate (IR) on the housing price index in Malaysia. Still, it has a positive correlation with the dependent variable. In contrast, the lending rate (LR) and unemployment rate (UR) on Malaysia's housing price index are significant but negatively correlated toward dependent variable. It was revealed that the GDP has an insignificant but positive correlation with the house price index. The research stated that home price rates react opposite to GDP rate, advancing the argument that there is a severe risk that house prices are in a bubble since GDP was not recognized as a driver of long-term house prices. Aside from Gross Domestic Product (GDP), the inflation rate was also identified as an insignificant but positive correlation with the house price index throughout our research. These two variables respond insignificantly to each other, demonstrating an insignificant relationship utilizing the notion that growing home prices fuel inflation in the short term. In contrast, rising house prices can reduce inflation in the long run. In other words, the impact of inflation on house prices is smaller than that of housing prices on inflation, meaning that home prices can hedge inflation over time. These conclude that GDP and inflation rate is not the determinant of the housing price index. Moreover, the other remaining independent variables used in our research which are the lending rate and unemployment rate, show significant and negative correlations simultaneously with the dependent variable. This verified that macroeconomic variable such as lending rate has a substantial impact on property values because the loan rate is related to the cost of the property, making it a significant consideration when acquiring a home. The same scenario goes for the unemployment rate as the fundamental driver that influences the housing price index in the country. Malaysian property costs are far higher today than in past decades.

Acknowledgments

We thank the anonymous reviewers for their useful suggestions.

Conflict of Interest

There is no conflict of interest associated with this publication.

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ISSN: : 1985-5079