An Analysis of the Factors Affecting House Prices in Malaysia – An Econometric Approach

Chitra Ganeson[a]'*, Illias Masri Abdul Muin[b]
[a]Universiti Sains Malaysia
Email: chitra.nagathisen@gmail.com
[b]Universiti Sains Malaysia
Email: illiasmasri@gmail.com

Abstract

The housing price in Malaysia remains an issue that makes a significant concern to the government as well as potential house buyers at large. The trend has portrayed discernable expansion of housing prices over the years. The study intends to expand on a previous research that only found Gross Domestic Product to have a significant impact on house prices in Malaysia. The results from the study were only able to explain merely 15% of the variations in house pricing. Further research in this study intends to determine other possible factors which could significantly impact the housing price in Malaysia. Variables selected include gross domestic product, inflation, unemployment rate and population. This study covers a period of 23 years from 1988 to 2010 using Multiple Regression method. The aim of the study is to develop a significant econometric model that can be used to forecast Malaysian housing price. By determining the significant factors that could affect housing prices in Malaysia, this study would outline concerns on the factors that contribute to volatile housing prices and hence assist the government in making significant policies in controlling the price of residential properties from escalating uncontrollably which can potentially invite financial disaster such as the subprime crisis that occurred in the USA recently.

Keywords: *House Price Index, Multiple Regression*

1. Introduction

The demand for housing in Malaysia is ever growing and this has seen an upwards trend in the pricing of houses in Malaysia. With growing population and the advent of nuclear family units, the complexities over issues regarding home ownership is increasing. The median house price in Malaysia are at 4.4 times the median annual income in the year 2014 (Khazanah Research Institute, 2015) which places Malaysian housing market at an "unaffordable" level. Prices differ based on location with urban areas centred around the Klang Valley and Penang commanding higher pricing levels compared to other parts. This is attributed to job opportunities and the scarcity of land although the House Price Index (HPI) reflects a nationwide increase in prices. The measurement unit for house prices in Malaysia is quantified by the Malaysian House Price Index. At the national level, prices of houses increased by 8% in 2014 from 2013 while the index for Klang Valley rose by 14.4% in 2013 from the previous year.

Theoretically, the supply of houses and price would reach equilibrium as time passes but studies have failed to reach such a conclusion. The expected notion is that house prices keeps on rising and is not reflective of the current affordability level of the population. Boelhouwer & De Vries (2001) found that building a national model that would be able to better understand the effects of external factors such as building costs

on house prices have prove to be impossible. Various factors have been propagated as having bearing on the movement of housing prices.

This paper is based on a previous study by Ong & Chang, (2013) where macroeconomic factors were seen to be the determining factors on the movement of house prices in Malaysia. Three variables, inflation rate, gross domestic product and income increment rate were used as independent variables to signify its relationship with the house price index. Gross domestic product was found to have the highest significant relationship with house price index although the results could only represent 15.70% of the variations in the index. This study expands on the previous research to ascertain other factors that significantly impacts the movement of house prices in Malaysia. Five variables are selected as independent variables that include population, gross domestic product, interest rate, inflation and unemployment rate.

Issues regarding house prices in Malaysia attract significant attention with various reasoning attached to the volatile pricing. Various factors have been pointed out as affecting housing prices, including interest rates, excessive liquidity, strong income and credit growth (Ciarlone, 2015). The rationale for understanding effects on housing price may avert a potential repeat of the Asian financial crisis, with increased understanding; better regulation may be imposed by the financial authorities (Collyns, & Senhadji, 2002). Changes in house prices are related with fluctuations in consumptions and borrowing, increasing wealth being associated with increased prices in housing asset (Campbell & Cocco, 2007). This is argued with the fact that increased value of houses minus the outstanding debt might not correctly reflect the wealth of the owner.

Increased consumption is reflective of perceived wellbeing of the economy and house prices would increase along with consumption (King 1990). A better economic prospect for the nation and increases in remuneration would increase the demand for housing and price fluctuations would follow suit.

2. Literature Review

2.1 House Price Index (HPI)

The house price index is reflective of the variations in pricing for the housing sector and is used as a guide for rents, debts and the risk assessment for housing loans that includes the Mortgage Backed Securities (MBS) (Bianconi & Yoshino 2013). The index measures the median price of houses for a certain time period and is used as the basis to determine the fluctuations of housing prices. It is not entirely without its flaws, a recent study by Aragon et al (2010) found that house price indexes in the USA failed to estimate the downturn of house prices for the recent years.

2.2 Gross Domestic Product

Few researches have been done linking the effects of macroeconomic factors on housing prices. Balázs Égert & Dubravko Mihaljek, 2007 studied the link between Gross Domestic Product (GDP) with observed house prices in the economies of Central and Eastern Europe. Goodhard & Hofmann (2008) assessed the link between house prices and monetary variable in terms of GDP and found a stronger correlation using recent samples from 1985 to 2006. In a study of the dynamics of housing prices in 15 OECD countries, (Englund & Ionnides 2002) found a steady increase of annual house prices along with increased GDP growth while a study in the city of Sao Paulo, Brazil

showed similar correlation (Bianconi & Yoshino 2013). The relationship is not the same generally and is dependent on various local factors, GDP and house prices have negative relationship in Singapore and Korea while it does not have an influence in Hong Kong (Tsatsaronis & Haibin, 2004).

2.3 Population

Increasing population rate would entail a higher demand for housing as new family units are created. Slower supply that is not in tandem with the demand for houses would drive up the prices as covered by Egert & Mihaljek (2007). Population growth and its link with housing prices have been covered in various literatures, (Blance, Martin & Vazquez, 2015); (Mankiw & Weil 1989) while Clapp & Giaccotto (1994) explored the relationship between the population and housing indices at a local level.
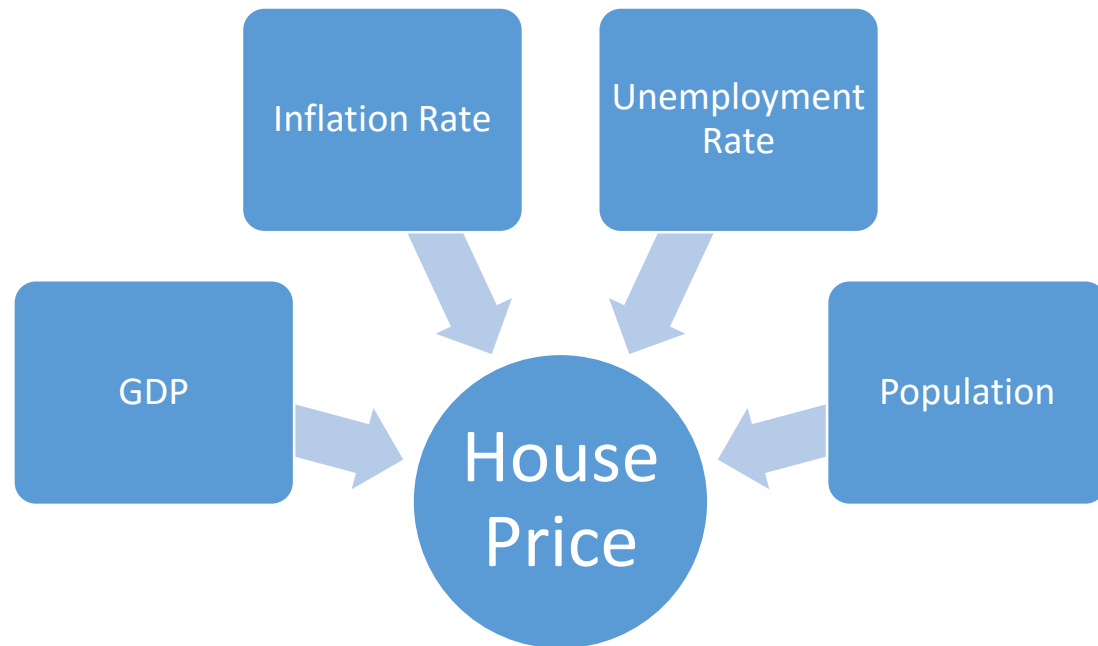
2.4 Inflation

The use of inflation rates as a variable in the study of house prices have been studied since the 1970s, (Dougherty & Order, 1982);(Harris 1989), with Consumer Price Index as the basis of measurement of inflation rates. The effects of inflation on household saving that bears on the demand for housing is studied by Engelhardt, (1994) although it found an asymmetrical relationship between the two.

2.5 Unemployment Rate

The interaction between unemployment and local housing prices have been covered by Johnes & Hyclak (1999) and Abelson, Joyeux, Milunovich & Chung (2005) while Jacobsen & Naug (2005) did not find a very strong relationship between the two. McCormick (1997) found a link between the effects of increasing housing mortgage on employment in the UK, a focus on regional unemployment. A focus on employee movement towards a regional area and it's effect of decreasing unemployment and it's link to house price is covered by Thomas (1993). Shukry, Chitrakala, Norhaya & Izran Sarrazin (2012) conducted a similiar regression analysis although the results were inconclusive.

3. Research Design

The overall objective of this study is to describe the stages in the research methodology used in this study. The framework of the study is formulated as follows:

House price will be the dependent variables to be tested by 4 independent variables namely gross domestic product (GDP), population, inflation rate and unemployment rate. The theories with regard to these 4 independent variables in this study are stated as follows:

H1:   GDP has a positive impact to house price index.
H2:   Population has a positive impact to house price index.
H3:   Inflation rate has a positive impact to house price index.
H4:   Unemployment rate has a negative impact to house price index.

3.1 Operationalization of Research Framework

Table 1 shows the designation used for every variables in this study as well as the source of the data that been used.

Table 1:   Measurement of Variables

Variables	Source of Data	Previous Research
1) Gross domestic product (GDP) (RM' 000 000)	Department of Statistics Malaysia	-
2) Population (P) ('000 000)	Department of Statistics Malaysia	
3) Inflation Rate (InfR)	Department of Statistics Malaysia	
4) Unemployment Rate (UeR)	Department of Statistics Malaysia	

3.2 Correlation Coefficient

The correlation coefficient for all variables is presented in Table 2 as follows:

Table 2:   Correlation Coefficient

	HPI	GDP	P	InfR	UeR
HPI	1.00				
GDP	0.91	1.00			
P	0.96	0.97	1.00		
InfR	0.97	0.96	0.99	1.00	
UeR	0.04	0.37	0.27	0.23	1.00

It is shown that the dependent variable and all independent variable are highly correlated as the correlation coefficients are all above 0.9 except for Unemployment. However, with regard to multicollinearity, GDP, P and InfR have a potential multicollinearity issue since the correlation between all these variables are above 0.7.

3.3 Multiple Regression Analysis

These data have been imported to EViews 8 to run a multiple regression analysis. Two models were run to get the best multiple regression model in this study. The first model were using 4 independent variables namely GDP, P, InfR and UeR while in the second model, variable P has been eliminated from the equation to test and improve the significance of every independent variables as well as to improve the adjusted R-squared figure for the model.

Table 3:   Model Summary: House Price Index

Model	R Square	Adjusted R Square
1	0.9615	0.9529
2	0.9635	0.9577

As we can observe in Table 3, modification in Model 2 does improve the R-square and the adjusted R-square. In this stage, we would use Model 2 since the findings after population data was eliminated improved the adjusted R-squared.

The result shows that the adjusted R-squared is 0.9577. Therefore the independent variables in this model (GDP, InfR & UeR) explain 95.77% of the variation in the regressand (HPI).

Table 4:   Coefficient Model 1

Model 1	Coefficient	Standard Error	t-Statistics	p-Value
β_0; Constant	35.5628	88.4909	0.4019	0.6925
β_1; GDP	7.33×10^{-5}	6.03×10^{-5}	1.2159	0.2397
β_2; P('000 000)	-1.6780	2.6679	-0.6298	0.5373
β_3; InflR	-12.6420	2.9771	-4.2464	0.0005

β_4; UeR	0.0081	0.0042	1.9138	0.0717

Table 5: Coefficient Model 2

Model 2	Coefficient	Standard Error	t-Statistics	p-Value
β_0; Constant	6.4308	54.1795	0.1186	0.9068
β_1; GDP	3.64×10^{-5}	5.00×10^{-5}	0.7283	0.4753
β_3; InflR	2.2215	0.6742	3.2948	0.0038
β_4; UeR	-9.9297	2.6724	-3.7193	0.0015

As we can observe in the Table 4, p-value for GDP (0.2397) and P (0.5373) are already more than alpha value (0.05) which will make these variables insignificant in this model. Thus, the model is being modified by eliminating the population data and the result is presented in Table 5.

In Table 5, it is found that p-value for GDP, although it has improved from the previous model but is still relatively higher than alpha value (0.4753> 0.05) while it is also found that the p-value of InfR is relatively lower than alpha value (0.0038< 0.05). Therefore, this study found that GDP is not a significant factor while inflation rate is significant. This finding however contradicts with the study of Ong & Chang (2013) where her analysis found vice versa.

In this study, it is learned that all variables are moving to the direction as mentioned in the theory but only inflation rate and unemployment rate are statistically significant with house price index.

4. Regression Equation

Since the modified model (model 2) is chosen, the multiple regression equation is hence given as follows:

House Price Index $= 6.4308 + 3.64.11 \times 10^{-5} \textbf{\textit{GDP}} + 2.2215 \textbf{\textit{InfR}} - 9.9367 \textbf{\textit{UeR}}$

The unemployment rate has contributed the highest impact in this model since it counts in the data given. It can be interpreted that for every 1% increase in unemployment, the house price index will in average reduce at 9.9367 unit. As for GDP, for every RM1,000,000 addition in GDP, it will drive the HPI to increase in 3.6411 unit and for every 1 unit increment of inflation rate, HPI will increase at 2.2215 unit.

5. Summary of Result

In this study, it is proven that only inflation rate and unemployment rate are significantly related to house price in Malaysia. Although GDP was found to be in the positive relationship, it is found to be insignificant to House Price Index in this study.

Table 7:   Summary of Hypotheses Findings of the Study

Hypotheses	Description	Result
H1	GDP has a positive impact to house price index.	Right direction but not significant
H2	Population has a positive impact to house price index.	Not supported
H3	Inflation rate has a positive impact to house price index.	Right direction and significant
H4	Unemployment rate has a negative impact to house price index.	Right direction and significant

6. Discussion

The hypotheses (Table 7) of this study are that Malaysian House Price Index was determined by the identified macroeconomic factors. There were a total of 23 secondary data of each variables that range from the year 1988 to 2010 in an annual basis. Four measurements of the independent determinants includes GDP, inflation rate and unemployment rate while the dependent variable is house pricing, measured by House Price Index.

In the end of the result, the objective to develop a multiple regression model to be used as a determinant for housing price is achieved and discussed. We have sufficient evidence to conclude that not all predictors in this study are significantly related to house price, but only inflation rate and unemployment rate are statistically significant to determine the house price index. In addition, it is also found that GDP is not significant to explain house price movements although it went to the right direction.

With the evidence above, we can conclude that the house price index in Malaysia has witnessed growth in the past decade as it has been driven by inflation rate. The escalating prices of other goods and services have significantly affected the house price in Malaysia. Increasing cost of land, construction-based supply as well as other commodities such as oil price might be the reason of price escalating in housing in Malaysia.

The emerging sustainable economic growth in the last few decades which caused the decreasing rate of unemployment in Malaysia has also significantly pushed up the demand for housing particularly in the urban area and hence escalate the house prices since the supply does not match the demand. Residential properties in urban areas such as Klang Valley, Penang, and Johor Bahru were dramatically affected due to the rapid economic boom in the last few decades.

Despite the high value of R-squared figures in the model produced in this study, there are still plenty of improvement room to be catered in order to conclude with the best model to explain house price movement in Malaysia. Population data that been used in this study is taking into consideration the whole population as in our country right now, we are experiencing slightly slower birth rate as compared to several decades back. Perhaps in future study, a main focus can be given to the population of certain age cluster throughout the period of the study.

7. Limitation of the Study

One obvious limitation of this study would be the number of observation used in the multiple regression models. It has slightly inadequate number of observation due to limited secondary data that can be obtained in this study. The study as far as this paper concerns just cover annual data ranging from 1988 to 2010.

8. Implication and Suggestion

Despite several limitation issues, it is obvious that inflation rate does affect housing price to escalate in the last few decades. There are several steps that can be implemented by the government to control the rapid rise of house prices in Malaysia.

First, in order to control house price, inflation rate should be properly controlled. Basic stuffs such as oil, power supply, water supply and other utilities including but not limited to transportation, road and highways should be controlled and ensured to be at stable price. Increasing the price of these items uncontrollably will affect the whole economic system and eventually will cause house price to increase as well.

Second, the taxation system should be implemented at the optimum level rather than maximum. This is because tax can cause goods and services price to increase, and hence inflate the economy. The recent implementation of GST does prove this theory. The government should seriously look forward to implement better management strategies in term of efficiency, and hence can reduce government consumption and perhaps increase government investment expenditure to future good. From this point, the

government can look after more beneficial projects including providing better public transportation network covering a wider area. Therefore more areas will be available to be developed into housing schemes and hence increase the housing supply and theoretically control the rise of house price in Malaysia.

Another strategy to reduce housing price from escalating is through increasing affordable housing supply with special scheme of land alienation by state government specifically to build affordable housing scheme. In Malaysia, the government through state government can acquire land using Land Acquisition Act 1960 and provide some specific area to be developed for public purpose. By using this strategy, cost of building a house is even smaller as the developer has only to pay some small amount of premium for the alienation rather than to pay high to the land owner to buy a land.

9. Conclusion

This paper has basically reviewed some literature with regard to house price escalation as well as testing of some empirical data to prove the theory. In the end of the study, it is learned that some of the variables tested in this study do affect the house price significantly, while some are not. The findings show that inflation rate has high correlation with house price, and unemployment rate can also affect house price. Therefore, we would conclude that with 95.77% adjusted R-squared resulted in the study, the government as in this context including state and federal government can play vital roles to control house prices from escalating. Prudent action should be taken in order to avoid economic crash due to property bubble from happen in Malaysia.

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