Macroeconomic Drivers of House Prices in Malaysia

Shanmuga Pillaiyan[a],*

[a]School of Business, The University of Nottingham Malaysia Campus, Semenyih, Selangor, Malaysia.
*Corresponding author.

Abstract

This paper investigates the macroeconomic drivers of house prices in Malaysia using VECM, over a fifteen year period. The key macroeconomic factors investigated were real GDP, bank lending rate, Consumer Sentiment, Business Condition, Money Supply, number of loans approved, Stock market (KLSE) and Inflation. The macroeconomic factors found to be significantly related to the Malaysian housing prices were inflation, Stock Market (KLSE), Money Supply (M3) and number of residential loans approved. The results hint at the potential of a housing price bubble as GDP wasn't identified as a driver of house prices.

Key words: House price; Malaysia; VECM; real GDP; Money supply; inflation number residential loan approved; housing bubble

INTRODUCTION

House prices in general are influenced by economic fundamentals as well as supply & demand dynamics of the local housing market. From time to times, a growth in house prices goes beyond what is supported by economic fundamentals, leading to a property bubble. Property bubble eventually bursts, resulting in a sharp drop in property prices and wealth destruction. This was seen in the US housing market during the 2008 financial crisis. The bursting of the US property bubble triggered the 2008 global financial crisis. The 2008 financial crisis clearly showed the tight interdependence between the housing market and the overall economy. A clear understanding of the macroeconomic drivers of house prices is critical to understand and effectively manage the overall economy.

The analysis starts by briefly examining the history of Malaysia's housing market in Section 4 to set the context. Next relevant literature review is presented in Section 5. This is followed by a short description of the research method in Section 6. Section 7 summarises the results of the analysis. Section 8 to 9 discusses the findings, its implications and some limitations of the study. Section 10 concludes this paper.

1. OBJECTIVE OF THE STUDY

The objectives of this study are as follow:

a) To investigate the macroeconomic factors influencing Malaysian house prices

b) To determine the relationship between the house prices and Macroeconomic factors such as real GDP, Money supply (M3), stock market (KLSE), average bank lending rate, Inflation (Consumer Price Index), Consumer Sentiments Index, Business Confidence Index and Loan approvals.

2. SIGNIFICANCE OF THE STUDY

Previous research conducted in developing countries cannot be directly adopted to the Malaysian housing market. Even among developing countries, Malaysian housing market is notably different due to its liberal policy on house ownership by foreigners. This research will help economist and government authorities better understand the macroeconomic factors driving house prices in Malaysia. Once a clear market structure is established, better macroeconomic models can be developed to forecast house prices. Government authorities will be able to better identify the significant macroeconomic factors that can be manipulated to influence the housing market.

3. HISTORY OF MALAYSIAN HOUSING MARKET

Malaysia's current booming and dynamic property marketing market had its humble beginnings after the nation achieved independence in 1957. Malaysian housing market has since grown by leaps and bounds together with the country's economic growth. The housing market has had several cycles of boom and bust. The table below summarises key events impacting the Malaysian housing market.

Table 1
Summary of Key Events and Their Impact on the Housing Market

No.	Year	Key development/ policy changes	Impact on the housing market
1	1966	The Housing Development (Control & Licensing) Act	● Improved legislation and transparency
2	1969	Racial Riots	● Collapse in property prices (30 % - 50%) in major towns such as Kuala Lumpur and Penang
3	1970	Civil Servant's Fixed rate Housing loan scheme (4%)	● Increased demand for housing
4	1974	Land Speculation Act	● Reduce speculation ● Moderate house price growth
5	1976	Real Property Gains Tax (RPGT)	● Reduce speculation ● Moderate house price growth
6	1986	Reduction in RGPT	● Stimulate demand
7	1997	Asian Financial Crisis (AFC)	● Prices dropped (15% to 20%)
8	2008	Global Financial Crisis	● Prices dropped
9	2009	BNM reduces OPR to an all-time low of 2%	● Stimulate demand ● Rapid price growth
10	2010	Loan-to-value (LTV) ratio of 70% imposed on individuals with more than two housing loans	● Reduce speculation ● Moderate house price growth
11	March 2011	My First Home Scheme	● Increase demand for affordable housing
12	July 2011	1Malaysia Housing Program (PR1MA)	● Increase demand for affordable housing
13	2013	Maximum loan tenure of 35 years Mortgage eligibility assessed on net monthly income Banning of Developer Interest Bearing Scheme (DBS) Increase in RGPT Minimum price of residential property eligible for purchase by foreigners increased to RM1 million.	● Reduce speculation ● Moderate house price growth

Note. Source: CIMB research (5 March 2012)

Over the years Malaysia has seen a strong growth in residential property prices since independence with several short periods of downturn. The downturns are generally aligned to periods of economic downturn. These periods of downturn are quickly followed by a period of rapid price increases.

4. MACROECONOMIC DRIVERS

4.1 Gross Domestic Product

It is widely recognised that real GDP is the main long run macroeconomic driver of house prices. Case et al. (2000) and Wit and Dijk (2003) define real GDP as the main determinants of real estate cycles. According to Zhu (2004) real GDP growth encompasses information contained in other more direct measures of household income, such as unemployment and wages. Tze (2013) found real GDP to be the main driver of house prices in Malaysia. Hii et al. (1999) found that real GDP is significantly related to the number of terraced, semi-detached and long houses constructed in Sarawak. The research found that terraces house prices in Sarawak increases with real GDP. Hii (1999)

showed that the price of detached houses in Sarawak does not have any significant relation with real GDP growth. This clearly shows that the housing market is fragmented by housing segments.

4.2 Interest Rate

Zhu (2004) found that there is a strong inverse relationship between interest rates and house prices. That is, house prices rise when interest rates drop. As most purchases are done on credit, interest rates are an additional cost to home buyers. The monthly loan instalment amount generally determines the amount a house buyer can afford. The monthly instalment is of course governed by the loan amount, interest rate and duration of the loan. A lower loan interest rate will result in a lower monthly payment. Consumer's purchasing decisions are more sensitive to the nominal amount of monthly payments than to the size of the loan in relation to household income (Zhu, 2004).

Barakova et al. (2003) found that improved availability of credit results in an increase in demand for housing when the households are borrowing constrained. Ramazan et al. (2007) found that in Turkey, a developing economy, interest rates had a bigger impact on the housing market

than compared to developed economies. This could be due to the fact that developing economies have a less mature financial market and are thus borrowing constrained.

Central banks manipulate the base lending rate to influence the interest rate on loans from commercial banks. In Malaysia, Bank Negara Malaysia manipulates the Overnight Policy Rates (OPR) to influence interest rates. The growth in housing demand driven by cheap credit will in turn result in higher housing prices. Growth in house prices will result in an increase in household wealth. This increase in wealth will encourage some households to undertake additional credit financed investments in the housing market. The credit cycles have matched the housing price cycles in a number of countries (see e.g. International Monetary Fund, 2000; Bank for International Settlements, 2001). This supports the view that, in recent years, the historically low interest rates have been the major contributor to the booming housing markets in most industrialised countries (Zhu, 2004).

Empirical analysis by Mansor et al. (2014), showed that there exists a strong long term relationship between aggregated house prices in Malaysia and the bank interest rates. In the long run there is a negative relationship between house prices and interest rates in Malaysia. Both aggregate house price and bank loans display a negative response to a positive interest rate shock.

4.3 Inflation Rate

Zhu (2004) identified inflation as the main driver of house prices with reference to several industrialised economies. Zhu (2004) proposes that the mechanism of influence is related to houses being viewed as an investment and a good hedge against inflation by the general public. As such during periods of higher uncertainty levels about future expected returns on investments in bonds and equities associated with high inflation also contributes to the attractiveness of real estate as a vehicle for long-term savings (Zhu 2004).

Surprisingly Tze (2013) did not find a significant relationship between inflation and Malaysian home prices. The study used Consumer Price Index (CPI) as a measure of inflation. The different results may be due to the short time period of 10 years studied by Tze. Zainuddin (2010) however found a strong long run relationship between inflation and Malaysian house prices.

4.4 Stock Market Prices

There are two mechanisms available to help explain the relationship between real estate prices and stock prices (Kapopoulos & Siokis, 2005). The first mechanism is the Wealth Effect. The Wealth Effect proposes that households who realise gains in share prices will have an increased demand for housing. Thus, a stock market boom will lead to a housing price growth.

The second mechanism is the Credit-Price Effect. The Credit-Price Effect proposes that house price increases will improve the balance sheet position of firms. Firms holding real estate in the balance sheets will see an increase in company's net value. Investors will be willing to pay a higher price for these companies, thus pushing up the price of these companies stock.

Goodness et al. (2011) showed using the nonparametric approach that in South Africa, the housing market and the stock market are correlated in the short-run and long-run. In the short run there is a wealth effect and a credit-price effect interdependence between the stock market and housing market in the South African economy. Instability in either one of the markets can easily spread to the other market.

Sutton (2002) and Borio & McGuire (2004) found that equity price movements and house price movements were correlated. Borio and McGuire (2004), found that housing price generally peaked one year after the peak in equity prices. From a theoretical perspective however, the causality of this relationship is not clear as the substitution effect and wealth effect point in opposite directions.

Lean (2012) found that in Malaysia, stock prices lead house prices. This would suggest that the Wealth Effect is at work in Malaysia. It can also be reasoned that stability in the stock market is crucial for stability in the real estate market.

4.5 Residential Loan Growth

The Financial sector directly influences the real estate market through mortgage financing. According to Davis and Zhu (2004), the sensitivity of bank credit to the value of property assets caused a cyclical movement in property prices, followed by a bubble bursting. Residential loan growth is used as a proxy to capture information on non interest rate factors such as government regulation impacting the uptake of residential loans.

Goodhart (2004) argues that financial sector liberalization is likely to increase the cyclical nature of financial systems by fostering cyclical lending practices of banks. History has shown that asset price bubbles have often been preceded by rapid expansion of credit and money (Goodhart, 2000).

Mansor et al. (2014) showed the strong relations between the aggregate house prices and bank credits. Bank credit was also found to exert significant impacts on short-run fluctuations in house prices. Bank credits have a positively long run relationship with house prices.

4.6 Money Supply

Goodhart (2008) points out that theoretically the relationship between monetary variables, house prices and the Macroeconomy is multi-facetted. Traditional monetarist view of the link between house prices and money is based on the Optimal Portfolio Adjustment mechanism. Goodhart (2008) explains that a growth in the money supply changes the equilibrium between cash and other liquid assets. In response to this economic

agents adjust their spending and investment decisions until equilibrium is again attained. This translates to an increase in price of a broad range of assets and a decrease in interest rates. As such, from a theoretical point of view, an increase in money supply will lead to an increase in house prices. Goodhart (2008) found that money growth has a significant positive effect on house prices.

Greiber and Setzer (2007) found a strong relationship between broad money supply and property prices in the euro area and the US. They were also able to show that causality ran in both directions. An increase in broad money growth will cause an increase in property prices. Alternately, an increase in property prices will cause an increase in broad money growth. Adalid and Detken (2007) analysed the effect of broad money growth on house prices in several industrialized countries. They found a significant relationship between broad money growth and house prices. This relationship was strongest during periods of price booms.

5. METHODOLOGY & DATA

5.1 Data

5.1.1 Dependent Variable-Malaysian Housing Prices Index (MPHI)
This study utilises quarterly data from 2000 to 2010 for all macroeconomic variables. The quarterly Malaysian Housing Prices Index (MPHI) measures the overall national price changes of houses. MPHI data is sourced from the Valuation and Property Services Department, Ministry of Finance Malaysia.

A house price index is used to measure changes in price, which is not caused by changes in the quality or quantity of the goods in the index (Lum, 2004). These changes, which include macroeconomic factors, affect the current value of houses (Lum, 2004).

The Malaysian house price index was developed in 1997 by the Valuation and Property Services Department. The MHPI consists of 70 sets of sub-indices including national house price indices, state house price indices and five house type sub-indices (terraced, semi-detached, detached, high-rise unit and other houses) for 13 states and two federal territories in Malaysia (Valuation and Property Service Department of Malaysia, 2001). Using these indices, the MHPI can display the longrun trends in the Malaysian house prices and evaluate the condition of the Malaysian housing market (Valuation and Property Service Department of Malaysia, 2001). The MHPI, which is a Paasche Index, is calculated based on the hedonic price method (HPM).

5.1.2 Independent Variables
In total eight (8) independent variables were used in the analysis. All data used for the analysis were quarterly data from 2000 to 2010.

Table 2
Independent Variables Analysed

No.	Variable	Abbreviation
1	Money supply	M3
2	Number of housing loans approved	LOAN
3	Bank lending rate	LEND
4	Stock market	KLSE
5	Real gross domestic product	GDP
6	Inflation (consumer price index)	CPI
7	Consumer sentiment	SENT
8	Business condition	BUSC

Quarterly real GDP figures were obtained from the Department of Statistics Malaysia. The quarterly Average Lending Rate was derived from the monthly Average Lending Rate sourced from the Department of Statistics Malaysia. Simple average was utilised to derive the quarterly figures from the monthly figures.

Quarterly Consumer Sentiment Index and Business Conditions Index are sourced from the Malaysia Institute of Economic Research (MIER). Quarterly figured of Money Supply (M3), Malaysian stock market (KLSE), Consumer Price Index and number of residential loans approved per quarter is sourced from Bank Negara Malaysia (BNM), which is the Malaysian Central Bank. Simple average was used to convert these monthly data to quarterly data.

5.1.3 The Methods and Results
We began our analysis by analysing the unit root properties of the nine selected variables. The PP-statistics of Table 3 show that BUSC and SENT are I(0) and the rest of the variables are I(1). Trends were included in the test when necessary according to graphical examinations of the time series. ADF yielded the same results (not reported here). All I(1) variables are used to fit a VECM in order to determine if long-run relationships exist among the seven I(1) variables.

Table 3
Unit Root Test Results

Variable	PP-Statistics	p-value	Trend
MHPI	3.045	1.000	Y
ΔMHPI	-6.536	0.000	Y
M3	-1.089	0.922	Y
ΔM3	-7.931	0.000	Y
LOAN	2.565	1.000	Y
ΔLOAN	-5.914	0.000	Y
LEND	-2.545	0.306	Y
ΔLEND	-14.783	0.000	N
KLSE	-2.369	0.392	Y
ΔKLSE	-5.801	0.000	N
GDP	-0.846	0.955	Y
ΔGDP	-6.999	0.000	N
CPI	-2.259	0.449	Y
ΔCPI	-5.745	0.000	N
SENT	-4.301	0.001	N
BUSC	-3.573	0.009	N

Next, we fit a cointegrating vector error correction model (VECM) developed by Johansen (1988) to determine the number of co-integrating relationships among the seven variables. Although the study focuses on how house price is affected by other variables, the single-equation ARDL model with house price on the LHS and other variables on the RHS, which can accommodate only one co-integrating relationship, would be incorrectly specified if there are indeed more than one co-integrating relationships among the variables. Thus, fitting a VECM is a more desire option. To fit a VECM, we first have to determine how many lagged variables to be included by fitting a VAR model with the non-differenced I(1) variables. We considered VAR(1) to VAR(5) and used the common information criteria to the selection. Table 4 reports the information criterions for VAR(1) to VAR(5) and the optimal lag was found to be 1.

Table 4
Lag Selection Criterions for VECM

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-128.514				8.09542	4.92779	5.02658	5.18327
1	-90.4479	76.132*	1	0.000	2.1046*	3.57992*	3.69283*	3.8719*
2	-89.7714	1.353	1	0.245	2.1314	3.59169	3.71871	3.92016
3	-89.7688	.00529	1	0.942	2.2126	3.62796	3.76909	3.99293
4	-89.6256	.28636	1	0.593	2.28577	3.65911	3.81436	4.06058
5	-89.2001	.85017	1	0.356	2.3379	3.68	3.84937	4.11797

We then apply the trace and maximum eigenvalue test of Johansen (1988) to determine the number of co-integrating relationships in the system. The trace statistic tests the null hypothesis that there are at most r co-integrating relationships against the alternative hypothesis that there is more that *r* co-integrating relationships; the maximum eigenvalue statistic tests the null hypothesis that there are at most *r* co-integrating relationships against the alternative hypothesis that there are r+1 co-integrating relationships. We allowed for a linear trend in the non-differenced data and co-integrating equations that are stationary around a nonzero mean. Table 5 reports the results of trace and maximum eigenvalue tests. Both tests reveal consistent results at 1% significance level: There are 2 co-integrating relationships in the model. Next, we fit a VECM with two co-integrating relations.

Table 5
The Trace and Max Test Statistics

```
                         Johansen tests for cointegration
Trend: constant                                   Number of obs =        59
Sample:  2 - 60                                            Lags =         1
```

maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value	1% critical value
0	7	-2287.4697		207.5241	124.24	133.57
1	20	-2248.0117	0.73751	128.6082	94.15	103.18
2	31	-2216.8861	0.65184	66.3570*1*5	68.52	76.07
3	40	-2201.4462	0.40749	35.4771	47.21	54.46
4	47	-2193.591	0.23377	19.7668	29.68	35.65
5	52	-2187.8385	0.17716	8.2618	15.41	20.04
6	55	-2184.0978	0.11909	0.7803	3.76	6.65
7	56	-2183.7076	0.01314			

maximum rank	parms	LL	eigenvalue	max statistic	5% critical value	1% critical value
0	7	-2287.4697		78.9160	45.28	51.57
1	20	-2248.0117	0.73751	62.2512	39.37	45.10
2	31	-2216.8861	0.65184	30.8799	33.46	38.77
3	40	-2201.4462	0.40749	15.7103	27.07	32.24
4	47	-2193.591	0.23377	11.5050	20.97	25.52
5	52	-2187.8385	0.17716	7.4815	14.07	18.63
6	55	-2184.0978	0.11909	0.7803	3.76	6.65
7	56	-2183.7076	0.01314			

The long-run relationships. Table 6.4 reports the two resulting long-run relationships from the fitted VECM and the coefficients were also expressed by Equation (1) and Equation (2). The significance tests suggested that all the RHS variables are statistically significant at least 10%

significance level. Equation (1) is the relevant one and it suggests that in the long-run house price is positively affected by KLSE, M3, and LOAN, and is negatively affected by CPI and LEND.

Table 6
VECM Analysis

Johansen normalization restrictions imposed

beta	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
_ce1						
r_mhpi	1	.	.	.	.	.
r_gdp	0	(omitted)				
r_cpi	1.404042	.7552058	1.86	0.063	-.0761346	2.884218
r_klse	-.0148365	.0071586	-2.07	0.038	-.0288671	-.0008059
r_m3	-.0001133	.0000317	-3.57	0.000	-.0001755	-.0000511
r_loan	-.0004203	.0001109	-3.79	0.000	-.0006377	-.0002029
r_lend	3.987572	1.99278	2.00	0.045	.0817942	7.89335
_trend	-11.60108	.	.	.	.	.
_cons	-400.1731	.	.	.	.	.
_ce2						
r_mhpi	-5.68e-14	.	.	.	.	.
r_gdp	1	.	.	.	.	.
r_cpi	6464.066	760.8522	8.50	0.000	4972.823	7955.309
r_klse	49.3674	7.212139	6.85	0.000	35.23187	63.50293
r_m3	-.2845479	.0319519	-8.91	0.000	-.3471725	-.2219232
r_loan	-.0129167	.1117526	-0.12	0.908	-.2319479	.2061144
r_lend	-17427.5	2007.68	-8.68	0.000	-21362.48	-13492.52
_trend	4419.409	.	.	.	.	.
_cons	-395956	.	.	.	.	.

$$MHPI = 400.17 - 1.404 CPI + 0.0148 KLSE + 0.0001 M3 + 0.0004 LOAN - 3.9876 LEND$$
$$+ 11.6 TREND + ECM^1 \quad \text{Equation (1)}$$
$$GDP = 395956 - 6464.066 CPI - 49.3674 KLSE + 0.2845 M3 + 0.0129 LOAN + 17427.5 LEND$$
$$- 4419.409 TREND + ECM^2 \quad \text{Equation (2)}$$

where ECM^1 and ECM^2 denotes the error terms.

Short-run dynamics. In order to observe the short-run dynamic of the model, the estimations of house price equation of the VECM in form of Equation (3) are reported in Table 5.

$$\Delta MHPI_t = \beta_0 + \beta_1 \Delta MHPI_{t-1} + \beta_2 \Delta M3_{t-1} + \beta_3 \Delta LOAN_{t-1}$$
$$+ \beta_4 \Delta LEND_{t-1} + \beta_5 \Delta KLSE_{t-1} + \beta_6 \Delta GDP_{t-1}$$
$$+ \beta_7 \Delta CPI_{t-1} + \beta_7 \Delta TREND_{t-1} + \beta_8 ECM^1_{t-1}$$
$$+ \beta_9 ECM^2_{t-1}$$

------------------Equation (3)

Both error-correction terms were negative and significant, which indicates the presence of long-run adjustments. The coefficient (-0.2316) suggests that house price converged toward equilibrium 23 per cent in one quarter through house price themselves. It implies that it took more than approximately 4 quarters (1/0.23=4.3) to eliminate the disequilibrium. It is also interesting to note that the cointegrating GDP relation enters significantly into the equation for house price with a negative sign. The negative coefficient (-.00006), although such a value

indicates slower adjustment, implies that any increase in GDP greater than that which is warranted by CPI, KLSE, M3, and LEND will feed through to house price deflation via the first error correction term. For example, in the second co-integrating relation (Equation 2) indicates a positive GDP-LEND relationship with a coefficient of 17427.5. A positive value of ECM^2 implies discrepancy from the long-run equilibrium relationship, let's say *LEND* is below its equilibrium value, which in turn causes LEND to adjust (upward) in the long run in order for the long-run relation reverts to the equilibrium. Such adjustments will cause LEND in the first co-integrating vector (ECM^1) to rise and since the coefficient of *LEND* in the first co-integrating relation is negative, $\Delta MHPI$ will fall in the next quarter. Among the lagged variables, only $\Delta LEND_{t-1}$ was found to be statistically significant. This indicates an immediate and negative impacts of increased *LEND* on change in house price. One must borne in mind that in Equation (1) or through the correction mechanism resulting from the negative ECM^1_{t-1} term in Equation (3),

the long-run relationship between *LEND* and house price was a positive one. If policy-makers pursue a short-term objective of cooling down house price by reducing *LEND*, one must carefully consider the duration of the policy because of the long-run reduced LEND could cause house price to rise. The changes in other lagged variables were insignificant. Thus, we should not expect the changes in these variables would affect the change in house price in the short-run, but only in the long-run.

Table 7
VECM, Equation (3)

		Coef.	Std. Err.	*P>z*
ECM^1_{t-1}	β_9	-0.2316	0.0468	0.0000
ECM^2_{t-1}	β_{10}	-0.00006	0.000036	0.094
$\Delta MHPI_{t-1}$	β_1	-0.1544	0.1345	0.2510
$\Delta M3_{t-1}$	β_2	-7.100×10^{-6}	1.690×10^{-5}	0.6740
$\Delta LOAN_{t-1}$	β_3	-4.260×10^{-5}	7.630×10^{-5}	0.5770
$\Delta LEND_{t-1}$	β_4	1.7782	0.7962	0.0260
$\Delta KLSE_{t-1}$	β_5	-0.0013	0.0023	0.5670
ΔGDP_{t-1}	β_6	0.000031	4.080×10^{-5}	0.4480
ΔCPI_{t-1}	β_7	-0.0417	0.2745	0.8790
t	β_8	-2.6523	0.6631	0.0000
constant	β_0	-37.9430	9.2706	0.0000
R-sq		0.8580		

Additional tests of weak exogeneity are reported in Table 7. The statistics test the null hypothesis that *MHPI* causes the other variables, but other variables do not cause *MHPI*. The result shows that the null hypothesis is strongly rejected. This confirms that *MHPI* can be used as endogenous variables in the model. The insignificant statistics for KLSE and *M*3 indicate that they are weakly exogenous to the system. Consequently, there is no loss of information from not modelling their short-term effects in the VECM. This is consistent with the broad picture of KLSE and *M*3 being weakly influenced by MHPI. If there is discrepancy in the long-run equilibrium relationships (e.g. ECM^1 or ECM^2 are too high), we shall not expect KLSE and *M*3 to respond to the correction of the discrepancy.

Table 8
Testing Weak Exogeneity of Each Variables

Equation	Adjustment parameters		
	Parms	chi2	p>chi2
D_r_mhpi	2	26.09486	0.0000
D_r_gdp	2	19.97984	0.0000
D_r_cpi	2	4.67153	0.0967
D_r_klse	2	3.183425	0.2036
D_r_m3	2	4.32459	0.1151
D_r_loan	2	13.32989	0.0013
D_r_lend	2	6.311188	0.0426

6. DISCUSSION

6.1 KLSE

The analysis shows that KLSE to be a long term driver of house prices. This finding is supported by the finding of Lean (2012) who found a strong wealth effect between KLSE and overall house prices in Malaysia. This suggests that profits gained from investments in stocks are reinvested in residential properties. There is a transfer of wealth from the stock market to the property market.

Only a small fraction of the population directly participates and profits from the stock market. This is generally the rich and middle class. There is a real potential of a housing asset bubble fuelled by gains from the stock market. As yet, there is no strong evidence of a property market bubble. Urban housing locations would be those one would expect to see more increase in demand following stock market appreciation. This hypothesis is supported by work done by Lena (2012). Lean (2012) found that there was a stronger correlation between house prices in Selangor and Penang (the two most urbanised states) and the stock market performance (KLSE).

6.2 Real GDP

The surprise result of this analysis is not identifying real GDP as a long term driver of house prices. This is in contrast to findings by Tze (2013) who found real GDP to be a driver of house prices in Malaysia. This is in disagreement with international studies such as such as Case et al. (2000) and Wit & Dijk (2003). This finding could be an indication that the house prices have deviated from economic fundamentals driven by real GDP growth. House prices could be a bubble.

6.3 Money Supply (M*3*)

The analysis showed that house prices is related to money supply (M3). This strong link between money supply (M3)

and house prices may indicate that a significant amount of wealth is being stored within the property market. In Malaysia, as it is globally, property is seen as a safe investment by many. Three main factors contributing to the growth in money supply in Malaysia are private credit growth, government operations and balance of payment.
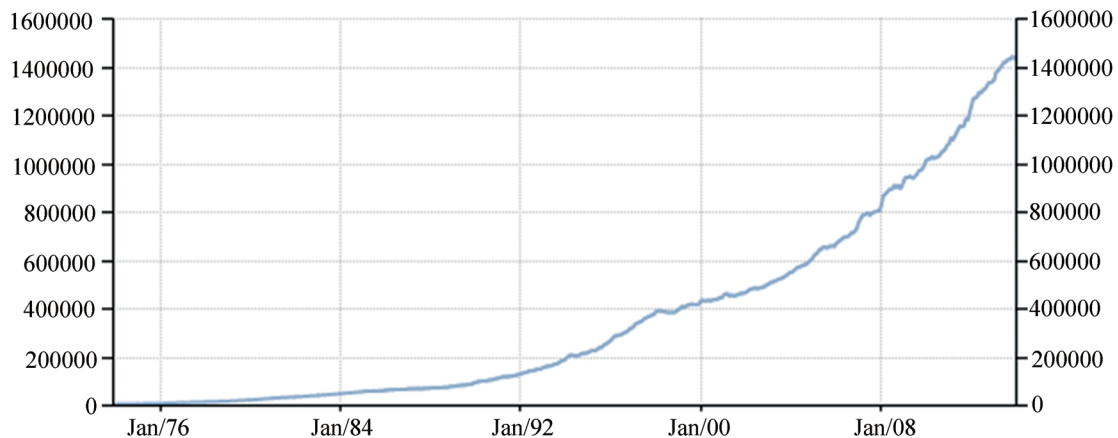
SOURCE:WWW.TRADINGECONOMICS.COM | CENTRAL BANK OF MALAYSIA

Figure 1
Malaysia Money Supply (M3)
Note. Source: Bank Negara Malaysia

As more and more investment money chases the limited number of houses available, prices are pushed up. This could lead to an unhealthy appreciation of house prices due to an investment need. In Malaysia alternative investments channels are still lacking maturity. The authorities may want to consider promoting alternative investments such as mutual funds and bonds. This will help alleviate the price pressure on houses from investment money.

6.4 Average Lending Rate

The analysis finds a long term inverse relationship between average lending rate and house prices. A lower average interest rate reduces the monthly instalment and thus increases affordability of houses. Average interest rates in Malaysia have drastically dropped since 1998. This in turn has contributed to the rise in house prices during the same period. There is a potential that very low average loan rates have fuelled a bubble in house prices.

SOURCE:WWW.TRADINGECONOMICS.COM | CENTRAL BANK OF MALAYSIA

Figure 2
Average Bank Lending Rate
Note. Source: Bank Negara Malaysia

6.5 Number of Loans Approved for Residential Property Purchase

This study shows a significant relationship between the number of residential loans approved, and house prices. It is possible that house price increases are due to excessive residential loan growth. This strong relationship, could also suggest the possibility that speculators are utilising financing to push up the price of residential properties. The finding is in line with Malaysian Central Bank which has taken steps to tighten residential loans.

6.6 Inflation (Consumer Price Index)

A common assumption is that inflation would be a factor influencing house prices. As expected, the analysis finds a significant relationship between Consumer Price Index and MHPI. Consumer Price Index is a measure of inflation in the economy.

6.7 Consumer Sentiments Index (Csi)

No strong relationship was found with CSI. Figure 3 clearly shows that CSI and MHPI do not move in tandem. Even during steep drops in CSI (during the 2008 global financial crisis), MHPI continued to increase albeit at a slower pace.
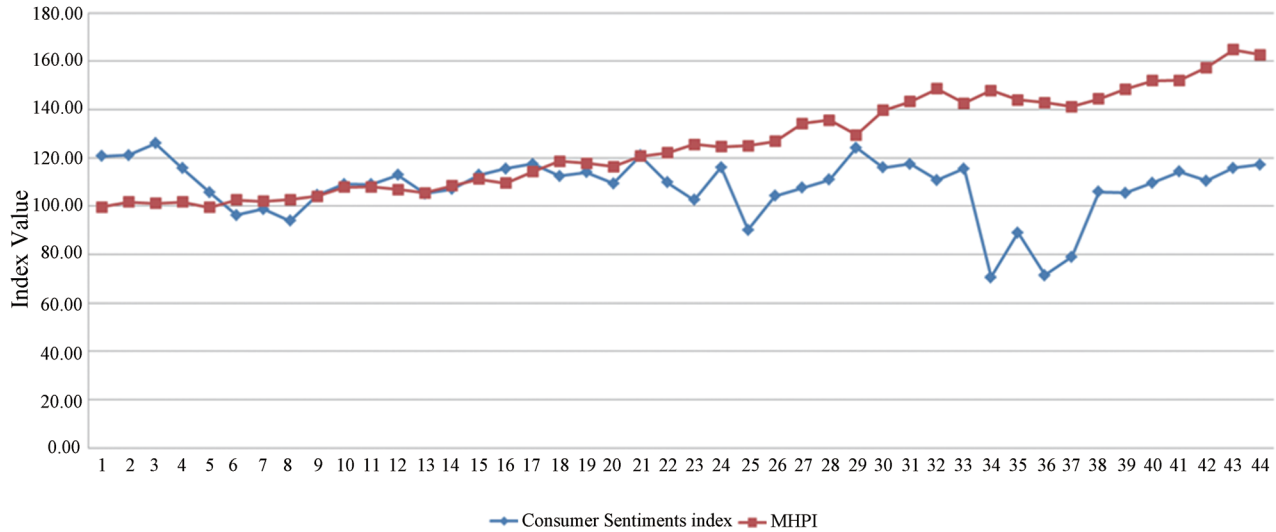
Figure 3
Consumer Confidence Index
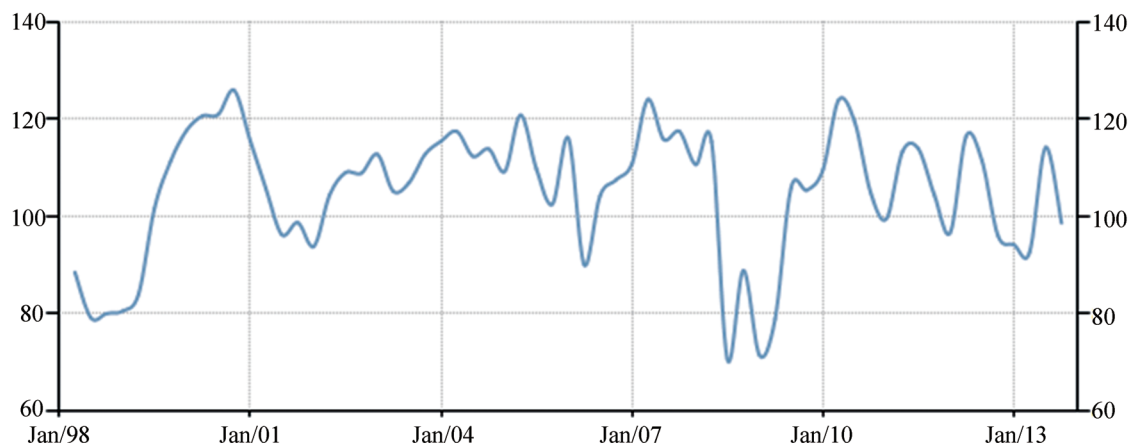*Note.* Source: Bank Negara Malaysia

Two main groups of house buyers are Genuine Buyers and Speculative Buyers. Genuine Buyers are those who purchase houses to fulfil their basic need for accommodation. Speculative Buyers on the other hand purchase houses purely as an investment. Speculative Buyers expect house prices to appreciate and they intend to profit by selling the property.

The lack of a strong relationship with CSI would indicate that most buyers are not influenced by CSI. Genuine Buyers would be expected to be less influenced by CSI as they are purchasing houses for their accommodation needs. In most cases this need cannot be postponed and will need to be fulfilled. Speculative Buyers would be expected to be more sensitive to CSI. Speculators would be less likely to make purchases during times of economic uncertainty or downturn.

6.8 Business Conditions Index (Bci)

No strong relationship was found with BCI. Similar to CSI, one would expect speculative buyers to be more sensitive to BCI. A lack of strong relationship between house prices and BCI may indicate the property market is dominated by Genuine Buyers. A similar argument as tabled for CSI in section 8.5 applies to BCI.

SOURCE:WWW.TRADINOECONOMICS.COM | MALAYSIAN INSTITUTE OF ECONOMICS RESEARCH

Figure 4
Business Confidence Index
Note. Source: Bank Negara Malaysia

127

6.9 Limitation of the Study

The scope of this study focused on MHPI movement relative to macroeconomic factors is as defined below:

a) This study only covers data for a period of 15 years, between 1999-2013.

b) Macroeconomics factor selected for analysis are real GDP, bank lending rate, Consumer Sentiment, Business Condition, Money Supply, number of loans approved, Stock market (KLSE) and Inflation.

c) VECM was used to analyse the relationship between MHPI and Macroeconomic factors.

This study only analyses 15 years of data. A study spanning a longer time period may help provide a better understanding. Certain macroeconomic factors may behave abnormally during the small period of time analysed. Other factors to potentially include in the study could have been rentals, housing supply, exchange rate.

7. IMPLICATION

7.1 Investment Implications

The analysis shows that the key drivers of MHPI are bank lending rates, number of housing loans approved, money supply, stock market and inflation. In should be noted that the global easy monitory policy has resulted in increased supply of money via easy credit which has pushed up overall asset prices.

As the analysis didn't identify GDP as a driver of house prices, there is a real possibility that house prices in Malaysia are currently in a bubble. Global studies have consistently found that house prices are driven by GDP. As such it is alarming that Malaysian house prices are not driven by GDP growth. House price growth has exceeded growth based on economic fundamentals such as GDP.

Investors should be cautious when investing in Malaysian housing properties. The housing market may be reaching a peak as interest rates cannot stay low for much longer. As indicated by the short term analysis, any increase in interest rates will result in a corresponding change in house prices in the next quarter.

7.2 Policy Implications

In general there are two key assumptions authorities can base their actions on. One is to assume that the property market is efficient and able to find the right equilibrium. The second assumption is that the property market is inherently inefficient and direct intervention is required.

Government policy should be aimed at maintaining an orderly property market. Malaysia government via the central bank (BNM) has taken steps to ensure that a property bubble doesn't develop in the residential property market. Care should also be taken to ensure that these measures do not result in an unordered drop in house price. As seen during the sub-prime housing crisis in the US, an unordered collapse in the housing market will quickly impact other segments of the economy.

### 7.2.1 Increase Market Efficiency

If it is assumed that the market is efficient, then the best course of action for any authority is to not interfere with the market. Authorities should instead focus on increasing the efficiency of the property market. The property market can be made more efficient by improving transparency and reducing transaction cost.

Transparency can be improved with the availability of timely, accurate and reliable property transaction data. The Malaysian government already makes available property data (such as MHPI) via the National Property Information Centre (NAPIC). This information is however is delayed by up to a quarter. The data is also not presented in a manner easily understood by the layman. The government could provide information up to date information on property transactions by area and house types. This would enable the layman and industry experts to have accurate and reliable data on actual transacted prices.

Governments should also take steps to reduce the transaction cost in the property market. The cost of identifying and researching houses, time required to secure financing, legal cost, taxes (stamp duty) and moving cost are all examples of transactional cost from a buyer's viewpoint. A seller has similar transaction cost related to identifying potential buyers (property agents are paid a percentage of the sales price) and tax (Real Property Gains Tax). Kenny (1998), highlights that transaction cost is a common argument presented to explain disequilibrium within the housing market. This would be in the time taken to complete a transaction and also additional cost in identifying and acquiring cost. In this view government should reduce the stamp duty and RPGT to reduce the overall transaction cost.

7.2.2 Direct Intervention

If the assumption is that the market is inefficient, then governments need to directly intervene in the market. Governments should have a double pronged approach to control property prices. Both, focusing on reducing the demand curve and increasing supply of houses.
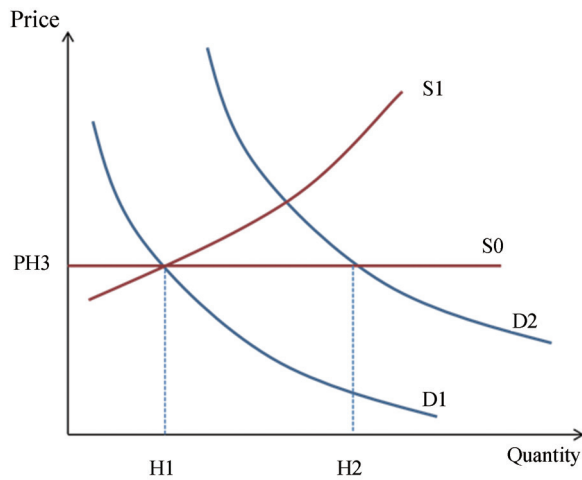
Figure 5
Long Run Equilibrium in the Housing Market
Note. Source: Kenny, 1998. "The Housing Market and the Macroeconomy: Evidence From Ireland"

Figure 5 shows diagrammatically the long run equilibrium in the housing market. Assuming that D1 is the current demand curve and S1 is the supply curve. In this scenario of an upward sloping housing supply curve, housing demand will have a significant impact on housing prices. Government efforts should be focused on constraining the demand curve from increasing to D2. This will help significantly control house prices.

The government should refrain from policies that will abruptly reduce the demand curve. Reduction in the demand curve can cause a significant drop in house price. As described earlier, sudden drops in the property sector can destabilise the overall economy. As such measures to control demand must be progressively implemented in small steps. This will ensure that the market is not overall shocked in the short term. A sudden large shock may cause the market to reach a threshold point and tank.

The initiatives implemented by the Malaysian authorities thus far are in line with the recommendations of this study. Government has initiated several measures to cool the property market. These measures by BNM are focused mainly on reducing housing loan growth. In 2010, BNM imposed a loan-to-value (LTV) ratio of 70% on individuals with more than two housing loans. In Jan 2012, BNM introduced regulation that all loan eligibility be calculated on net income of the borrower after deduction of statutory deductions for tax and retirement fund, and consider all debt obligations. In 2013, BNM set a maximum loan tenure of 35 years for all property loans. These measures by BNM, are in line with this study that finds a relationship between housing loan growth and MHPI increases.

This study revealed real GDP, M3 and inflation as the other key drivers of MHPI. The government initiatives to grow the nation's economy indirectly fuels growth in the housing price. Organic growth in line with economic growth is desired. Government's drive to increase real GDP per-capita as part of Vision 2020 will indirectly push house prices up. Government's policy is to encourage export driven growth and maintain a positive trade surplus will help grow the money supply (M3). Increase in money supply (M3) will in turn increase MHPI. In line with overall economic growth, the stock market will also increase. This further contributed to increase in MHPI.

Government must take steps to ensure that interest rates do not rise sharply. This may be difficult with the US tapering QE and eminent interest rate hikes. On the other hand a sudden and large increase in interest rates may result in the market reaching a tipping point. A sudden sharp rise in interest rates may not allow sufficient time for house owners to readjust their finances. This may result in house owners being unable to pay their housing loan instalments and finally defaulting on the loan payment. A large enough number of defaults will lead to a collapse in the housing market.

The government needs to intervene in the supply of new houses. Government can help ensure sufficient supply of low cost housing by allocating government land for the use. Private developers are focussed on higher end housing developments which are more profitable. Left to market forces, there will be a shortage of low cost and affordable houses. This will result in an increase in the price of low cost houses.

7.2.3 House Ownership
The main issue affecting house ownership is large disparity in wealth among citizens. It should be noted that Malaysia has the highest GINI coefficient in Southeast Asia (46.2 in 2009). The large disparity in income may be hiding the true affordability of houses. A small group of high income individuals are likely skewing the average household income. As such the simple average is not representative of the true situation experienced by most households. A more realistic picture would appear if the outliers are dropped from the statistical analysis.

Wealthy individuals are able to purchase several residential properties whereas the average earner is not able to even purchase one property. Wealthy individual's speculative purchases help to push up overall house prices. This makes houses less affordable for the average family. There is a danger that in the long run this will create two distinct classes of citizens, landlords and citizens who don't own any property. Government initiative to curb speculators / investors is in the right direction. Increasing percentage of down payment for second and subsequent house purchases will help.

The government should take specific steps to reduce the GINI coefficient. One laudable initiative has been the introduction of the minimum wage on 1 January 2013. The policy sets a minimum wage of RM900 per month (RM4.33 per hour) for Peninsular Malaysia and RM800 per month (RM3.85 per hour) for Sabah, Sarawak and the

Federal Territory of Labuan, covering both the local and foreign workforce, except for domestic workers such as domestic helpers and gardeners. The minimum wage will ensure lower end workers are appropriately compensated.

The government should also consider implementing capital gains text. Currently Malaysia doesn't not have capital gains tax other than Real Property Gain tax. Due to this a large amount wealth created via capital gains (stocks, sale of businesses, etc.) are not taxed. The lack of capital gains tax enables the wealthy to amass ever greater wealth via capital gains. Revenue from capital gains tax can be used to further uplift the masses and reduce the wealth gap.

CONCLUSION

Malaysian house prices (MHPI) were found to have a strong long term relationship with inflation, Stock Market (KLSE), Money Supply (M3) and number of residential loans approved. 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. This could indicate that house prices have in the last fifteen years deviated from economic fundamentals. Malaysian Central Bank's actions are in line with this papers analysis. Investors should be cautious when making new investments in the Malaysian housing market.

REFERENCES

Adalid, R., & Detken, C. (2007). *Money's role in asset price booms*. ECB Working Paper No 732.

Barakova, I., Bostic, R. W., Calem, P. S., & Wachter, S. M. (2003). Does credit quality for homeownership. *Journal of Housing Economics,12*(4), 318-336.

Borio, C., & McGuire, P. (2004). Twin peaks in equity and housing prices? *BIS Quarterly Review*, March, 79-93.

Case, B., Goetzmann, W., & Rouwenhorst, K. G. (2000). *Global real estate markets — Cycles and fundamentals*. NBER Working Paper No. 7566.

Case, K. E. (1986). The Market for Single Familly Homes in the Boston Area. *New England Economic Review*, May/June, 38-48.

Case, K. E., & Shiller, R. J. (1989). The efficiency of the market for single familly homes. *American Economic Review, 79*(1), March, 125 - 137.

Chen, N. K. (2001). Bank net worth, asset prices and economic activity. *Journal of Monetary Economics, 48,* 415-36.

Goodhart, C., Hofmann, B., & Segoviano, M. (2004). Bank Regulation and Macroeconomic Fluctuations. *Oxf Rev Econ Policy (Winter) 20*(4), 591-615.

Goodhart, C., & Hofmann, B. (2008). House prices, money, credit, and the macroeconomy. *Oxf Rev Econ Policy (2008) 24*(1), 180-205.

Goodness, C. A., & Balcilar, M., & Gupta, R. (2011). *Long- and short-run relationships between house and stock prices in South Africa: A nonparametric approach*. Working Papers 201136, University of Pretoria, Department of Economics.

Greiber, C., & Setzer, R. (2007). *Money and housing – Evidence for the Euro Area and the US*. Deutsche Bundesbank Discussion Paper, Series 1: Economic, Studies, No. 12/2007

Hii, W. H., Latif, I., & Nasir, A. (1999). *Lead-lag relationship between housing and gross domestic product in Sarawak*. Paper Presented at The International Real Estate Society Conference 26-30th July.

Johansen. (1988). *The mathematical structure of error correction models*. Contemporary Mathematics.

Kenny, G. (1998). *The housing market and the macroeconomy: Evidence from Ireland*. Research Technical Papers 1/RT/98, Central Bank of Ireland.

Kapopoulos, & Siokis. (2005). *Stock and real estate prices in Greece: wealth versus "credit price" effect* (pp.125-128). Applied Economics Letters, Routledge Publications.

Lean. (2012). Wealth effect or credit-price effect? Evidence from Malaysia. *Procedia Economics and Finance, 1,* 259-268

Lum, S. K. (2004). Property price indices in the commonwealth: Construction methodologies and problems. *Journal of Property Investment & Finance, 22*(1), 25-54.

Mansor, H. I., & Law, S. H. (2014). House prices and bank credits in Malaysia: An aggregate and disaggregate analysis. *Habitat International, 42,* 111-120,

Ramazan, S., Bradley, T. E., & Bahadir, A. (2007). Macroeconomic variables and the housing market in Turkey. *Emerging Markets Finance & Trade, 43*(5), 5-19

Sutton, G. (2002). Explaining changes in house prices. *BIS Quarterly Review, September,* 46-55.

Tze, S. O. (2013). Factors affecting the price of housing in Malaysia. Journal of Emerging Issues in Economics, Finance and Banking (JEIEFB). *An Online International Monthly Journal* (ISSN: 2306 367X), *1*(5).

Wit, & Dijk. (2003). The global determinants of direct office real estate return. *Journal of Real Estate Finance & Economics, 26*(1), 27-45.

Zainuddin, Z. (2010). *An empirical analysis of Malaysian housing market: Switching and non-switching models*. A thesis submitted in partial fulfilment of the requirements for the degree of doctoral of philospohy in Finance. Lincoln University.

Zhu, H. B. (2004). What drives housing price dynamics: Cross-country evidence. *BIS Quarterly Review, March*.