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THE IMPACT OF LIBERALIZATION ON HOUSE PRICE IN MALAYSIA

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ABSTRACT

When the property liberalization was announced in 2009, Malaysia faced high demand from foreigners. Consequently the price of houses increased significantly. This paper intends to examine the impact of liberalization on house price, using quarterly set data between the period of Q1:1999 and Q4:2012. By utilizing Johansen Cointegration test, the relationship between liberalization and house price in Malaysia is proceeded with Vector Error Correction Model. The findings show that liberalization has a positive however insignificant impact on house price, thus warrant further research to be taken in order to achieve consistent results in the relationship between liberalization and house price.

Keywords: House price; Liberalization; Malaysia; Long-run relationship; VECM

1. INTRODUCTION

The boom in property and real estate topics become talk of the town in East and South East Asian. The boom was due to pouring of investors into China and its surrounding countries (Jung-Myung, 2010). The spillover effects are taken positively by Malaysia who did not wait too long to attract investors and to choose property sector as a stone that kills two birds – i) attract cash rich investors and ii) stimulate the sector's growth. It is a realization that Malaysia is unable to compete with India and China's low cost of production and so the choice to develop and liberalize property sectors (and further attract FDI) is seen as an emerging way to increase the utility level.

A dynamic property development stimulates dynamic market via economic activities of the direct-property related players i.e., developers, contractors, banks, insurance, architect, carpentry shops, furniture shops, etc. The indirect players such as the building management and maintenance, landscape, security sectors will get the spillover effects of the active property development.

When the property liberalization was announced in 2009, Malaysia faced high demand from foreigners. The 'flipping' practise dragged the price to become higher, or insanely high. The zero approval arrangement from Foreign Investor Committee (FIC) and the allowance of acquiring 100% equity for property below RM20 million, it is viewed as government's openness to foreigners. It attracts more foreign buyers. This has been proven in areas such as in KLCC area, Shah Alam and Penang Island. For a decent family, a similar double storey house which was sold at RM150,000 in year 2000 is selling at RM300,000 per unit in year 2010. The dilemma is, while the Singaporeans, Hong Kong, Taiwanese (just to name a few) see the RM500,000 unit – RM18million unit as affordable, the locals viewed it as ridiculously-priced.

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The liberalization of real estate sector has turned out to pose problematic issue of housing affordability. The policy which attracts foreigners have caused the housing development to skewed to erection of luxury houses which meet foreigners demand who could pay them handsomely. The liberalization has also opened the chances for foreigners to buy any house in Malaysia, therefore, the house segment cater for the middle income Malaysian was then swarmed by foreigners which have a better advantage at demanding them. High demand for this segment has pushed the price further, causing the middle income earners no choice but to search for house segment that they can afford. Unfortunately, this effect results in crowded demand for other house segment and drives the house price to increase further.

This study examines the house price model in the presence of liberalization. We would like to examine whether liberalization has an impact on the house price in Malaysia. Based on this study, we hope to answer the long-run relationship between house price and liberalization. The remainder of this paper is as follows. Section 2 discusses the previous literature. Section 3 describes the econometric modelling and estimation techniques. Empirical findings are described in Section 4, while Section 5 concludes this study with policy recommendation.

2. LITERATURE REVIEW

Price theory asserts that in a free market economy the market price is determined by supply and demand. The equilibrium price is set so as to equate the quantity being supplied and that being demanded. In reality however, the price may be distorted by other factors, such as tax and other government regulations. The house price studies can be divided into several clusters - dynamics study (see among other, Capozza, Hendershott, Mack and Mayer, 2002, Hort, 1998, Englund and Ioannides, 1997, Caplin and Leahy, 2010, Favara and Song, 2014, Kim and Rous, 2012), cycle study (see among other, Cooper, 2013, Bordo and Landon-Lane, 2010), residential facilities study (see among others Zietx, Zietz, Sirman, 2008, Kuethe and Keeney, 2012).

Our review of literature suggests that many house price determinant studies include finance-related variables such as the deregulation issue, policy, interest rate and mortgage rate. Michalski and Ors (2012) and Landier, Sraer and Thesmar (2013) for example, found interstate banking deregulations had a strong and immediate impact on banking which immediately causing a sharp increase in house price correlation. Egert and Mihaljek (2007) studies the determinants of house prices in eight transition economies of central and eastern Europe (CEE) and 19 OECD countries. They reanalyze the impact of 'conventional fundamental determinants' of house prices, such as real interest rates, GDP per capita, housing credit and demographic factors on house prices in CEE. The study found that house prices in CEE are determined to a large extent by the said factors. Similarly to Ong (2013), his research on house price determinants in Malaysia found out that the gross domestic product (GDP), population and RPGT are the key determinants of housing prices although changes in housing prices may not necessarily be influenced by the gross domestic products (GDP), population and RPGT in Malaysia. Interestingly, Pillaiyan (2015) found that the potential of a housing price bubble as GDP wasn't identified as a driver of house prices in Malaysia, although other macroeconomic variables such as inflation, Stock Market (KLSE), Money Supply (M3) and number of residential loans approved are significant in explaining house price.

Apart from economic factors, Yeap and Lean (2017) examined the impact of housing policies in sustaining house prices in Malaysia at both aggregate and disaggregate levels. While supply and

demand factors are significant in explaining house price, they focused on two major housing policies–mortgage interest tax relief (MITR) and Developer Interest Bearing Scheme (DIBS). They found out that although aggregate house prices do not react to any economic variable in the long run, it responds positively to interest rate and DIBS in the short run.

Hashim (2010) claimed that housing market is unsustainable for two reasons; first, when the price is too high and ownership is difficult due to unaffordability of buyers to purchase a home. Second, market can be unsustainable when the price of house price is exposed to speculative activities and unpredictable. The importance of monetary policy in addressing bubbles was discussed by Bernanke (2010). Assigning the correct monetary policy could be crucial as some observers claimed that excessively easy monetary policy by central bank caused house price bubbles in the US. The problem is when the unavoidable bubble collapse, it will be the major source of financial and economic stresses (see also Ahearne, Ammer, Doyle, Kole and Martin, 2005, Del Nego and Otrok, 2007). Nonethless, house price rise when interest rate fall is not a proof that low interest rates cause bubbles. The proponents of using the policy however, a greater use could prevent and control bubbles in the prices of housing and other assets (Jarocinski and Smets, 2008, Reifschneider and Williams, 2000).

3. RESEARCH METHODOLOGY

This study aims to evaluate the relationship of Malaysia house price, liberalization, house supply and loan. The data were from Bank Negara Malaysia and National Property Information Centre (NAPIC). The data were in quarterly basis and span from Q1: 1999 and Q4: 2012 (56 observations). The selection of data is based on data availability. We use these variables within a multivariate framework in case of Malaysia. All variables are transformed into natural logarithm form. The general equation is modelled as following:

$$HP_t = f(LIB_t, HS_t, LOAN) \quad (1)$$

$$lnHP_t = \alpha + \beta_1 lnLIB_t + \beta_2 lnHS_t + \beta_3 lnLOAN_t + \varepsilon \quad (2)$$

where HP_{it} is house price index for Malaysia, *LIB* is liberalization, represented by the inversion of lending interest rate, *HS* is the number of houses approved for construction and *LOAN* is amount of loan distributed. We expect that property liberalization affects house price positively as LIB is proxied by 1/interest rate. It is expected that house supply to affect house price negatively and amount of loan distributed affects house price positively.

Before we examine the relationship, we perform stationary test on all series using Augmented Dickey Fuller test. The results produced (τ) are compared against the critical Dickey-Fuller (DF) test. If the τ value is lower than the DF value, we reject the null hypothesis of the variable contains unit root. Table 5.2 shows the result of the τ value at level and at first difference level for all variables. At level, all τ values are greater than 1% level of DF critical value, that is -3.571; indicating that these variables are not stationary at level. However, when these variables are tested at first difference level, their τ values are lower than the 1% level of DF critical value, which is -4.153. The results reject null hypothesis and it can be concluded that these variables are stationary at first difference, *I*(1). When a time series is not stationary, then time series regressions are spurious. Gujarati (1998) stated that as most of time series are nonstationary, one would be wary

of doing regression based on time series data. He however suggested that even if individually, the time series variable are nonstationary, it is possible that there is still a (long-run) stable or equilibrium relationship between the two. In this case, the combination of these time series are said to be cointegrated.

To examine the cointegration possibilities, we employ the Johansen Cointegration test, with the null hypothesis of no cointegration relationship in the equation system. This approach has several advantages over the Engle-Granger two stage approach and since it is based on VAR, we might not have to worry over whether the explanatory variables are exogenous or endogenous. While Engle-Granger does not cater for restrictions, Johansen approach enable us to apply restrictions to the cointegrating vectors. This Johansen cointegration analysis determines the number of cointegrating vectors, *r*, using the maximal eigenvalue procedure as given in Johansen (1988). The number of cointegrating vectors is determined sequentially based on the log-likelihood ratio test statistics. There are two tests provided, namely trace and maximal eigenvalue tests. The main importance of these two tests is the both tests have no standard distributions under the null hypothesis, although approximate critical values are tabulated by Oswald- Lenum (1992). Nevertheless, Johansen and Juselius (1990) suggest that the maximal eigenvalue test is more powerful than the trace test. We complemented our cointegration analysis with vector error correction model (VECM). The general VECM is modelled as following

$$\Delta_{z_i} = \sum_{t=1}^{k} \Gamma_t A_{z_{t-i}} + \Phi z_{t-1} + \Psi d + e_t \quad (4)$$

where z_i is a vector of non-stationary variables. The matrix Φ has reduced rank equal to r and can be decomposed to $\Phi = \alpha'\beta$, where α and β are $p \times r$ full rank matrices and represent adjustment coefficients and cointegrating vectors respectively. *d* is the vector of deterministic variables which may include constant term, linear trend, seasonal dummies and impulse dummies. The error term is assumed to follow the normal distribution.

In order to find out the number of cointegration relationship among the variables, Johansen-Juselius (1990) provide two different tests, namely trace and maximum eigenvalue tests. In trace test, the null hypothesis assumes that there are at most r cointegrating vectors and it is tested against general alternative. In the maximum eigenvalue test, the null hypothesis of r cointegrating vectors is examined against *r+1* cointegrating vectors.

4. RESULTS AND DISCUSSION

This section presented the results of house price model analysis starting from the unit root test, correlation test, Johansen test of Cointegration, the long-run relationship, the vector error correction model (VECM). Our unit root test results show that the series are all stationary at first difference, I(1), (Table 1).

Table 1: Unit root test – ADF Test results

	Level		First difference		Conclusion
	Constant	Constant & Trend	Constant	Constant & Trend	
*ln*HPIM	2.306 (0)	0.257 (0)	-6.401** (0)	-6.874 (0)	*I*(1)
*ln*LIB	-2.688 (1)	-3.193 (1)	-6.340** (0)	-6.205 (0)	*I*(1)
*ln*HS	-2.523 (0)	-2.666 (0)	-9.831** (0)	-6.830** (0)	*I*(1)
*ln*LOAN	-2.850 (0)	-3.122 (0)	-4.500** (4)	-4.260 (4)	*I*(1)

Notes: Lag in parentheses ( ). Asterisk** indicates the rejection of null hypothesis at least at 5% significant level. Number of lag is based on Akaike Info Criterion automatic selection with a maximum lag of 7. 5% critical values are -2.922 (for level & C), -3.571 (for level & C/T), -4.153 (for 1st difference & C) and – 3.502 (for first difference and C/T), respectively. H_0= unit root.

Table 2 shows the correlation matrix between Malaysia HPI (ln*HPIM*), liberalization (ln*LIB*), house supply (ln*HS*) and amount of loan distributed (ln*LOAN*). As liberalization is proxied by an inverse of interest rate, therefore, we would expect hypothesis between ln*LIB* and ln*HPI* positive. Early diagnostic shows HPI Malaysia (ln*HPIM*) is positively correlated with ln*LIB*, that is $\rho_{\ln HPIM|\ln LIB} = 0.90$. The negative correlation is also seen between the HPIM and house supply, $\rho_{\ln HPIM|\ln HS} = -0.25$. High positive correlation between amount of loan distributed and house price ($\rho_{\ln HPIM|\ln LOAN} = 0.84$) provides an early indication that amount of loan might have a significant influence in explaining the house price.

Table 2: Correlation Analysis between HPIM and independent variables

	*ln*HPIM	*ln*LIB	*ln*HS	*ln*LOAN
*ln*HPIM	1.00			
*ln*LIB	0.90	1.00		
*ln*HS	-0.25	-0.26	1.00	
*ln*LOAN	0.84	0.76	-0.20	1.00

Although there is no specific guideline of how much coefficient is considered to contribute to multicollinearity problem, this study takes caution of coefficients that exceed 0.70. Thus, from the same table, multicollinearity is observed between independent variable, that is between ln*LOAN* and ln*LIB* ($\rho_{\ln LOAN|\ln LIB} = 0.76$). One possible answer for the high correlation between amount of loan distributed and liberalization is perhaps due to liberalization policy that attracts borrowers. Nonetheless, we decided to include loan due to its prominent influence in theory.

4.1. Johansen Cointegration Test – House Price Malaysia

We test the cointegration relationship between house price index, ln*LIB*, ln*HS* and ln*LOAN*. In testing the possibility of cointegration relationship, the null hypothesis is that there is no cointegrating relationship between variables tested. We validate the result against the trace and max-eigen statistics; i.e. if the OLvalues are larger than the 0.05 and 0.01 level, we can reject the null hypothesis and conclude that there is one or more cointegrating relationship exists. In Table 3 the results show that at least one cointegrating relationship exists between *ln*HPI and other macroeconomic variables, as the OL values are higher than 5% OL critical value. Comparing the values with other hypotheses, we can safely said that the model has one cointegration relationship between variables.

Table 3: Johansen Cointegration Results – HPIM

H_0	Trace	5%/1% CV OL[a]	Max-Eigen	5%/1% CV OL[a]
$r = 0$	51.040*	47.89/54.46	31.914*	27.07/32.24
$r \leq 1$	17.126	29.56/45.65	8.491	20.97/25.52
$r \leq 2$	8.635	15.41/20.04	5.321	14.07/18.63
$r \leq 3$	3.314	3.76/6.65	3.314	3.76/6.65

*denotes rejection of hypothesis at 5% level [a]Osterwald Lenum critical values (Osterwald-Lenum, 1992)

Before examining for the existence of long-run relationship among the variables in each equation, it is necessary for us to determine the appropriate lag length (k). Pesaran and Shin (1998) argued that although AIC and SBC might have similar small sample properties, the latter operates slightly better in many tests. Pesaran and Pesaran (1997) earlier, noted that it is fairly regular for the SBC to select a lower order of VAR when compared to the AIC. This study has a small sample size (56 observations) with the number of explanatory variables ranging from two to four. Therefore, the possible maximum lag order that we could set is 3or 4. Gradually, we eliminate the most insignificant. Three main indicators willbe referred to, to choose for the best model. Those indicators are *R*2, AIC and standard error of regression.

4.2. Long-run relationship, VECM

The existence of cointegrating relationship might prove to us that there is a reliable and significant relationship in HPI model. Table 4 produces the result of long-run relationship test between HPIM, LIB, HS and LOAN. In the model it shows that except for LIB, all independent variables tested are significant at various confidence levels. The variable of interest, LIB has an expected positive sign (0.363), however, it is insignificant at both 1% and 5% level. The result in the long-run is consistent with the short-run model, implying further testings need to be done using other relevant liberalization proxy. House supply also affects house price positively, as the estimated coefficient is 0.16 – suggesting when house supply increases by 1%, house price increased by 0.16%.

Table 4: Long-run relationship of house price in Malaysia

Dep. Variable = *ln*HPIM	
*ln*LIB	0.363
	(1.70)
*ln*HS	0.160*
	(2.01)
*ln*LOAN	0.520***
	(6.00)
C	0.513

Note: Asterisks ** and * stand for significant at 1% (2.567) and 5% (1.96) respectively. Figure in ( ) denotes t-value

We justify the existence of cointegrated relationship by observing the significance of the error correction term, ECT (-1) in Table 5. The ECT (-1) estimated coefficient is -0.034 and is significant at 5 percent level, thus indicating that 3.4 percent of this disequilibrium is corrected between one quarter or 13.6 percent between one year.

Table 5: VECM results - HPIM

Panel I: Short-run coefficient of VECM results – HPIM equation	
ECT_{t-1}	-0.034*
	(-2.11)
$\Delta \ln HPIM_{t-1}$	-0.288*
	(-2.00)
$\Delta \ln HPIM_{t-2}$	0.071
	(0.52)
$\Delta \ln LIB_{t-1}$	-0.091
	(-1.51)
$\Delta \ln LIB_{t-2}$	0.029
	(0.55)
$\Delta \ln HS_{t-1}$	0.026**
	(3.76)
$\Delta \ln HS_{t-2}$	0.016*
	(2.13)
$\Delta \ln LOAN_{t-1}$	-0.003
	(-0.44)
$\Delta \ln LOAN_{t-2}$	0.005
	(0.88)
C	0.015*
	(4.88)
Panel II: Model Criteria	
R^2	0.438
Adjusted R^2	0.321
S.E equation	0.009
F-stat	3.736
Akaike AIC	-6.055

Panel III: Diagnostic checking	
Normality	0.1837
	[0.912]
Serial Correlation	1.0578 (2)
	[0.396]
Heteroscedasticity	1.2074 (3)
	[0.333]
Stability	1.1894
	[0.286]

Note: Asterisks ** and * stand for significant at 1% (2.567) and 5% (1.96) respectively. Figure in ( ) denotes t-value. For the criteria, we focused on the model with the highest R^2 but with lowest standard error (s.e.) of regression, along with AIC. For Panel III, figure in [ ] denote p-value, while figure in ( ) stands for number of lag. Jacque-Bera is the test for the normality of the residuals. Serial Correlation LM Test is the test for the autocorrelation. White Test is the test for possible heteroscedasticity in the residuals. Ramsey's RESET test is test for stability test.

The R^2 of the model is 0.44 implying that in the short-term, 44 percent of variation in HPIM is influenced by variations in its independent variables. The adjusted R^2 is 32 percent, implying the model is less fit when additional variables are included. From Panel III, the robustness of the model has also been confirmed by several diagnostics tests such as LM test (Breusch-Godfrey serial correlation test), White test (heterogeneity test), Jacque-Bera test (normality test) and Ramsey's reset test (stability test) under 1percent critical value.

5. CONCLUSION

This paper intends to examine the impact of liberalization on the house price in Malaysia. Our results found that liberalization has a positive however statistically insignificant impact in increasing the Malaysia house price. This suggest that when Malaysia opened up its real estate sector to outsiders, we can not be sure of whether the policy was actually the one that drove Malaysia house price.

As our study capitalized on interest rate as the proxy for liberalization, the essence captured by interest rate was not in agreement of Gupta, Miller and Wyk (2010) which suggest contractionary monetary policy exerts a negative effect on house prices at the national level. Since monetary policy have the potential to increase leverage, therefore careful exercise should be implemented by the Bank Negara (Central Bank of Malaysia).

Nonetheless, it has to be taken into consideration of other factors such as the abolishment of real property gains tax (RPGT) that might also contribute significantly to flipping activities. Since we use interest rate as our proxy for liberalization, alternatively future research should also consider RPGT and the effectiveness of the Malaysia as My Second Home program. Liberalization undeniably could contribute to the growth of the country, however, future research on its impact on house price must be performed further using alternative measurement to ensure of the result consistency. In a country where the locals are still struggling to find a decent home, liberalization measure must be analyzed carefully so that locals' needs are not jeopardized at the expense of foreign contribution.

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