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WHAT DRIVES HOUSE PRICE IN MALAYSIA? IN SEARCH OF AN ALTERNATIVE PRICING BENCHMARK FOR ISLAMIC HOME FINANCING

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Abstract

The current practise of the Islamic banks to rely on market interest rate as pricing benchmark for their home financing products has been a subject of intense debate among many parties. Muslim scholars have warned that it is highly discouraged as it could lead to a possible convergence between the practices of the Islamic and conventional banks. This paper intends to address the financing issues in the discussion of human settlement or housing policy by presenting the determinants for house price index as well as looking into the possibility of adopting the House Price Index (HPI) to replace the market interest rate as a pricing benchmark for the Islamic home financing. The study applies Auto-Regressive Distributed Lag (ARDL) method on a model comprising HPI as the dependent variable and a set of independent variables consisting of economic, housing demand and housing supply factors. The findings lead to the formulation of recommendations as a way forward for the Islamic banking industry in particular, and the economy in general. This will require a paradigm shift from basic financing products to a more holistic approach which integrates supply of housing factors, as well as urban planning and urban finance, with human rights and recognizes the need to place and shelter people.

Keywords: home financing; House Price Index, Islamic banking; benchmarking; interest rates

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INTRODUCTION

In Malaysia, home financing has been the major contributor to the financing portfolio of Islamic banking industry since the establishment of the first Islamic bank in 1984. The importance of home financing to the Islamic banks is well-reflected by the domination of home financing to total financing of the Islamic banks. In 2015, for example, home financing contributes nearly 24 percent to Islamic banking's total financing (Bank Negara Malaysia, 2015). Recently, there are increasing interests among the Islamic banks in Malaysia to adopt the *Musharakah Mutanaqisah* (MM) contract in replace of the *Bai-Bithaman Ajil* (BBA) for the home financing product. The MM home financing is essentially a share-equity type of financing where customer and bank take up a joint-ownership of the house with the bank's share of ownership of the house being gradually bought by the customer. The joint contract will come to an end when all of the bank's share of the property is bought by the customer (at the end of the financing period), and the ownership of the house will be fully transferred to the customer. Since conceptually the MM adopts the contracts of *Musharakah* (joint venture) and *Ijarah* (leasing), this product is considered to be innovative as it moves the Islamic banks away from the commonly adopted debt-based contract of BBA.

Despite the increasing interests on the MM product, a major issue remains. Many have suggested using the rental rate as the benchmark for Islamic home financing as it is indicative of the real value of the property being occupied. In essence, the rental price indicates the values of usufruct or usage of the property in monthly payment. In this regard, the movement of market rental pricing is deemed as a suitable alternative to the conventional rate. Consequently, Abdul Razak and Meera (2009), and Amin, Abdul Rahman and Abdul Razak (2013) urge that interest rate should be replaced by rental rate as the benchmark in determining the price of equity home financing. Several other studies have also proposed that house prices as reflected by the House Price Index (HPI) to be a true measure of the value of houses, thus is a possible candidate to price the Islamic home financing product. Exploring the relationship between the macroeconomic factors and movements of housing prices, these studies found that the HPI has significant relationship with major macroeconomic indicators (see, for example, Li & Chand, 2013; Glindro et al., 2011).

This study examines the dynamic interactions of the HPI with macroeconomic factors with the aim of determining its suitability as a pricing benchmark for the Islamic home financing. By providing robust empirical evidence, we aim to further enrich the limited studies on the use of HPI as a pricing benchmark for Islamic home financing product.

HOUSE PRICE INDEX: CONCEPT, COMPONENTS AND APPLICABILITY IN BENCHMARKING HOME FINANCING

Definition and Concept of House Price Index

The House Price Index (HPI) represents the general movement of house prices, thus serves as a broad indicator for the performance of the housing market. In Malaysia, the Malaysian House Price Index (MHPI) report is published on a quarterly basis by the National Property Information Centre (NAPIC) under the Valuation and Property Services Department of the Ministry of Finance, Malaysia. The MHPI covers the housing market in the 13 states and 2 federal territories of the country. Apart from the overall or all-price index, disaggregated data based on the type of houses, namely terrace, high-rise, detached and semi-detached are also provided. Different weights are given for different property type in the calculation of the MHPI. The data is available for three base-years, namely 1990, 2000 and 2010 (starting from 2016:Q1). According to NAPIC, the changes in the base year are intended to reflect changes in house price due to buyers' preference and the emergence of new trends in the marketplace.

The HPI is computed based on the hedonic regression model with the underlying hypothesis that the price of a particular good (in this case is the house) can capture significant determinants by taking into account both the spatial and structural attributes of the good (Rosen, 1974). As a result, the construction of the HPI includes specific locational and physical attributes of the house such as land area, floor area, building age, distance from the nearest town centre, floor level (for high-rise only), house type, building quality, tenure type and neighbourhood classification.

Specifically, the following formula is adopted in estimating the current period house price of the "average" house, depending on the base year. For example, for the base year 2000:

$$L_t = \frac{\exp\left(\sum_{j=1}^{n} B_j(t)\, Q_j(2000)\right)}{\exp\left(\sum_{j=1}^{n} B_j(2000)\, Q_j(2000)\right)} \times 100$$

Where,

"exp" symbolises 'exponent'
$B_j(t)$ = hedonic model regression coefficient of current period
$B_j(2000)$ = hedonic model regression coefficient of the base year 2000
$Q_j(2000)$ = characteristic averages for houses sold in 2000

As shown in Table 1 below, the factors used in the Principal Component Approach of the hedonic price model include physical and environment factors (24 items), social factors (3 items), and economic factors (3 items).

Table 1. Factor Components in the Malaysian House Price Index

Factor	Principal Component
A. Physical and Environmental	1. Scheme age 2. Local authority area 3. Location (core, inner, middle, outer or fringe of a city/town) 4. Proximity to town/city 5. Proximity to school 6. Proximity to community retail centre 7. Proximity to regional shopping centre 8. Playground/open space 9. Drainage (frequency of flood occurrence in a particular scheme/neighbourhood) 10. Availability of electricity, water and modern sanitary sewer 11. Quality of entrance and exit roads 12. Availability and type of public transport 13. Quality of landscaping 14. Pattern of land use by category 15. Number of housing units 16. Number of terraced units 17. Number of semi-detached units 18. Number of detached units 19. Number of high-rise units 20. Low-cost unit proportion 21. Type of building construction 22. Quality of principal structure 23. Average number of bedrooms per unit 24. Average number of bathrooms per unit
B. Social	1. Ethnic structure 2. Quality of neighbourhood in the surrounding 3. Type of land uses in the surrounding
C. Economic	1. Household income 2. Level of occupancy 3. Frequency of property turnover/transaction

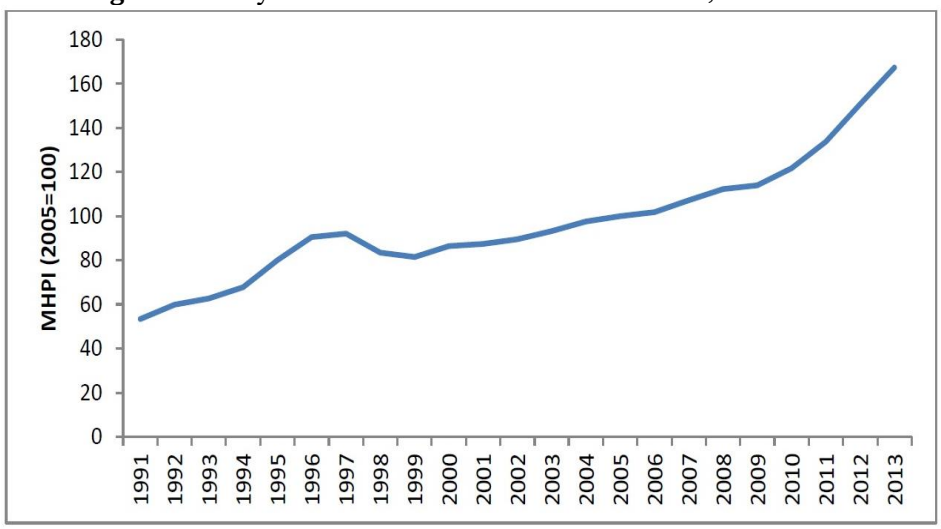
Source: Valuation and Property Services Department, Malaysia. (2016). Malaysian House Price Index, Q2.

The following variables are included as independent variables in the regression models and Figure 1 provides the corresponding plot of the change in the MHPI based on annual data.

1. Land area (for landed property such as terraced, detached and high-rise unit);
2. Floor area;
3. Age of building;

4. Distance from the nearest town centre;
5. Floor level for subject property (for high-rise unit only);
6. House type;
7. Building quality;
8. Tenure type (freehold or leasehold); and
9. Neighbourhood classification.

Figure 1 Malaysia's House Price Index-Annual Data, 1991 - 2013



Source: Valuation and Property Services Department (2015) The Malaysian House Price Index.

On a quarterly basis since 2001, the movement of house price in Malaysia suggests that the overall performance of Malaysia's house price is increasing over the years, indicating a continuous increase in the house prices in general. The increase of house prices over the years can be attributed to the strong demand for houses amid the expansion of the economy, resulting in a higher purchasing power of the Malaysians. Meanwhile, the change in the index showed an even stronger correlation with the economic performance. The highest rate of increase of the MHPI was in 1991 at 25.5 percent, indicating the economic boom experienced by the country, along with the high inflow of foreign funds into the various economic sectors, including the construction and real estate sector. However, the HPI declined substantially to its lowest in 1998, reflecting the worst economic contraction in the Malaysian history and the resulting declined in the construction sector and real asset prices in the aftermath of the Asian financial crisis in 1997. Relatively smaller declines are recorded in 2006 and 2009 in view of several policy implementations by the central bank in efforts to avert asset price inflation due to speculative activities by, among others limiting the availability of credit for purchase of non-owner occupants' houses.

Determinants of House Price Index

Physical and locational attributes

Various studies have examined the components of house price. These studies examined the impact of physical and locational factors on housing purchasing. A study included the housing attributes and buyer's demographic in investigating the impact of house price for Malaysia housing market (Majid, Said, & Daud, 2012) using Chi- square Test. The result showed that elements of the demography especially employment, marital status and gender affected property purchase criteria. These attributes become the important aspects that have always been considered by the buyer prior to purchasing a housing unit.

Previous studies have also employed analyses using multiple regression to estimate the hedonic housing prices. Most included the location-specific attributes of the physical criteria and micro-neighbourhood elements in valuing the house price. The study by Li and Brown (1980) has empirically shown that that housing value has an impact to the housing age, which generally declines as the house gets older. There was a significant interaction effect between lot size, the number of rooms and location (near to neighbourhood area) that contributed to the implications for house price. Other similar studies also considered physical and locational attributes in their studies (Pashardes & Savva, 2009; Fletcher, Gallimore, & Mangan, 2000).

Jim and Chen (2007) assessed the environmental externalities factors to the house price impact in China by the hedonic pricing method. The result showed that living quarters and floor area, security and good outdoor environment carried significant hedonic values. Ting (2008) studied the interaction approach between housing attributes, absolute location and household characteristics for China housing market. The result showed that these attributes give significant impact to house price. Another study carried by Tse (2002) examined the physical housing attributes and neighbourhood effects in Hong Kong house prices.

A study by Forrest, Glen and Ward (1996) examined the relationship between the availability of public transport of commuter rail services and the pattern of house prices in the Northern city of England. The study has shown the important locational attributes to the housing price. Theriault, Des Rosiers, Villeneuve, & Kestens (2003) studied the impact of type, age, educational attainment, income and the previous tenure status of the buyers to house price for Canada market. The result showed the significant effect of income on the location rent, as well as the premium paid by highly-educated households, gave greater effect to house price.

Macroeconomics attributes

Scholars have also studied the relationship of rate of return by using the mortgage interest rate to real GDP, interest rate (three-month TBR), consumer price index

(CPI), and real effective exchange rate (REER). Goodhart and Hofmann (2008) assess the links between money, credit, house prices and economic activity in 17 industrialized countries, spanning the period 1970 Q1–2006 Q4. The study shows the evidence of a significant multidirectional link between house prices, monetary variables, and the macroeconomic. Oikarinen (2009) identifies long run relation that ties real house price to real income, loan-to-deposit-ratio and real interest rate. Gimeno and Martinez-Carrascal (2010) examine the relationship between house purchase loans, house prices, labour income and nominal interest rate. The findings of these studies show that a unique long run relation that ties real house prices to real income, loan-to-deposit-ratio and real interest rate.

Many researchers have also conducted studies on the housing market based on the hedonic model. Linz and Behermann (2004) found that it seems feasible to compile a hedonic price index for owner-occupied housing in Germany, at least on quarterly basis by using Hedonic Pricing for the German House Price Index. Day (2003) applied the hedonic housing price model for Glasgow by including the structural (physical), accessibility, neighbourhood and environmental characteristics of the properties. In the case of Cyprus' real estate market, Pashardes and Savva (2009) examined the impact of macro and micro variables on house prices from 1988 to 2008. About 4,872 observations were included on various housing types like detached and semi-detached, a number of bedrooms, size of the building, geographical location and distance from the nearest city centre. The study found that house prices are sensitive to population, cost of construction materials and labour, GDP growth, and the sterling-euro exchange rate. However, the number of foreign workers tends to restrain house price increase and the stock market was negative.

METHODOLOGY

This paper employs multivariate time series analysis based on Auto-Regressive Distributed Lag (ARDL). In analysing the relationship between the variables, the ARDL essentially includes the current and also the lagged (past) values of the explanatory variables (the *X*'s) which called a 'distributed-lagged model'. The model also includes one or more lagged values of the dependent variable among its explanatory variables which called an 'autoregressive model'. The ARDL approach can be applied regardless of the stationary properties, whether *I(0)* or *I(1)* of the variables in the samples and allows for inferences on long-run estimates which is not possible under the alternative cointegration procedures (Pesaran & Smith, 1998).

The model selects using the model selection criteria, such as the adjusted R^2, Schwartz-Bayesian criteria (SBC) which known as the parsimonious model (selecting the smallest lag length). Finally, the ARDL approach provides robust results for a smaller sample size of the cointegration analysis. The ARDL models used in this study can be written as the following general models:

$$HPI_t = \alpha_0 + \beta_1 V_t + \beta_2 W_t + \beta_3 X_t + \beta_4 Y_t + \beta_5 Z_t + \epsilon_t \qquad (1)$$

where:

HPI = House Price Index
V = Housing loan
W = Production of other articles of concrete, cement and plaster
X = Production of basic iron and steel products
Y = Production of construction-related products
Z = Real Gross Domestic Products

In establishing the presence of this long-run relationship between house price and its determinants, the study employs the ARDL-based bounds testing procedure suggested by Pesaran, Shin and Smith. (2001). The ARDL model expressed in an unrestricted error correction form is stated below:

$$\Delta HPI_t = \theta_0 + \theta_1 HPI_{t-1} + \theta_2 V_{t-1} + \theta_3 W_{t-1} + \theta_4 X_{t-1} + \theta_5 Y_{t-1} + \theta_6 Z_{t-1} + \sum_{i=1}^{k} \emptyset_{1t} HPI_{t-1} + \sum_{i=0}^{k} \emptyset_{2t} V_{t-1} + \sum_{i=0}^{k} \emptyset_{3t} W_{t-1} + \sum_{i=0}^{k} \emptyset_{4t} X_{t-1} + \sum_{i=1}^{k} \emptyset_{5t} Y_{t-1} + \sum_{i=1}^{k} \emptyset_{5t} Z_{t-1} + \mu_t \qquad (2)$$

where Δ is the first difference operator, k is the optimal lag length, and all variables are as defined above. The bounds testing procedure has several advantages. It requires no knowledge of the variables' unit root property thus, evades the problem of pre-test bias inherent in cointegration tests as the residual-based test of Engle and Granger (1987) and the VAR-based test of Johansen (1988) and Johansen and Juselius (1990). In addition, the preliminary standard unit root tests are noted to lack power and have poor size property especially in small samples. The bounds testing is applicable irrespective of whether the variables are *I(0), I(1)* or mutually co-integrated. The variables are said to be *I(d)* if it requires differencing d times to achieve stationary. In normal cases, the long-run relationship is restricted to the case of a set of non-stationary variables. The ARDL cointegration test extends the analysis to a set of variables that have mixed integration properties. Besides that, the Engle-Granger suffers from considerable small sample bias and the Johansen-Juselius test is not appropriate for small size samples, while the bounds test has better small sample properties. These advantages of the test seem to fit this study.

In the bounds testing procedure, the null hypothesis states that there is no cointegration or long-run relationship between house price and its determinants, which is based on the joint significance of the lagged level variables in Equation 1 (i.e. H_0: $\theta 1 = \theta 2 = \theta 3 = \theta 4 = \theta 5 = 0$). The test statistics are then compared to two critical value bounds with the lower value when the regressors are *I(0)* and upper value when there are *I(1)*. The null hypothesis is rejected in favour of cointegration among the variables if the test statistics exceeds the upper critical value bound. Meanwhile, if the test statistics is below the lower critical

value bound, no long-run relationship between the variables exists. Finally, the test is conclusive when the test statistics are within the bounds. In this study, the unit root property is tested among all the variables. Note that, a single equation-based test, the bounds testing result may be sensitive to which variable is specified as a dependent variable. In the empirical literature, common practice to specify alternatively different variables in the model as the dependent variables. Thus, this paper follows the practice. Once the long-run relationship between the variables is established, the study may uncover the long-run house price to supply and demand coefficients. The short-run dynamics of house price behaviour can then be modelled using a restricted error correction model.

RESULTS

Descriptive Analysis

Table 2 below provides descriptive statistics of quarterly changes in HPI and the possible explanatory variables stated above. In particular, it gives the descriptive statistics of the benchmark variable, namely the HPI, and the possible explanatory variables, namely (i) GDP, (ii) housing loan, (iii) basic iron and steel products, (iv) production of construction-related products, (v) imports of construction materials & mineral products, and (vi) other articles of concrete, cement and plaster.

Table 2 Descriptive Statistics of Variables

	HPI	GDP	Housing Loan	Concrete	Construction material	Iron and steel
Mean	1.86	2.32	2.62	2.92	3.39	3.68
Minimum	-0.36	-1.05	2.23	-3.11	-0.41	-0.68
Maximum	2.50	2.81	3.06	4.80	4.05	4.5
Standard Deviation	0.62	0.65	0.15	1.45	0.74	0.93

The results of the simple correlation analysis are provided in Table 3. The main benchmark indicator, the HPI has a significant relationship with most of the indicators, namely the macroeconomic indicator (GDP), demand indicator (housing loan), and supply indicators (construction material, and iron and steel). It is, however, rather puzzling to see that the HPI has a negative relationship with housing loan. In general, the results of the correlation analysis are as anticipated with the variables affecting the housing market to be significantly correlated with each other.

Table 3 Descriptive Statistics of Variables

	HPI	GDP	Housing Loan	Concrete	Construction material	Iron and steel
HPI	1	0.72**	-0.27*	0.08	0.69**	0.70**
GDP		1	-0.10*	-0.10	0.98**	0.94**
Housing Loan			1	0.10*	-0.11*	-0.18*
Concrete				1	-0.11	-0.08
Construction material					1	0.93**
Iron and steel						1

Note: * and ** denote significance at the 5% and 1% levels, respectively.

Estimation Results

The short-run relationships between the HPI and GDP, housing loan, concrete, construction material, and iron and steel were examined using the ARDL bounds testing procedure. Following the optimal lag length selection, the next step was to apply the bounds F-test to establish a long-run relationship between the variables under study.

As shown in Table 4, the results of the bounds tests suggest that, except for housing loan (which was a proxy for the demand factor), all other explanatory variables showed significant co-integration with the HPI. In particular, the HPI had a significant relationship with the economic indicator, namely GDP, suggesting that as the economic situation improves, it gives significant impact on the housing market. The HPI was also significantly related to the supply-side factor as reflected by its significant relationship with factors such as indices of concrete, construction-related materials, and iron and steel. However, it is interesting to note that the HPI had no significant relationship with the demand side factor, namely the housing loan extended by the banking institution as shown by the insignificant F-statistic for the variable.

Table 4 Results of the Bounds Tests

Dependent Variables	Computed F-statistic	
HPI	14.8186**	
GDP	9.8043 ***	
Housing loan	1.7617	
Concrete	13.1231***	
Construction-related	17.1219***	
Iron steel	5.6136***	
Critical value	Lower bound	Upper bound
1%	2.08	3
5%	2.39	3.38
10%	3.06	4.15

*Notes: *, ** and *** indicate significance at 10%, 5% and 1% levels, respectively.*
[a] *Critical value is obtained from Pesaran, Shin & Smith (2001)*

Table 5 Long-run ARDL Model Estimates

	House Price Index	**t-statistics**
C	-8.3155	-3.6756
GDP	-3.649	-3.2397***
Housing Loan	2.9567	3.5693***
Concrete	-0.1305	-1.4407
Construction-materials	-0.7654	-1.2634
Iron and steel	3.8483	5.1451***

The results from the long-run ARDL estimation are shown in Table 5. The results show that there are significant long-run relationships between HPI with the economic performance indicator (GDP growth), demand indicator (housing loan), and one of the supply indicators (iron and steel production index). The long run relationship between HPI and GDP was found to be negative and significant, which is rather puzzling. Meanwhile, the relationship between HPI and demand indicator – housing loan was a positive and significant one, suggesting that an increase in demand for housing manifested by an increase in the amount of housing loan results in an increase in HPI. While this relationship is rather obvious, it has a significant implication. This result highlights that the housing market was significantly influenced by bank loans to the house price which could possibly fuel speculative activities resulting in the danger of a housing inflation or housing bubbles.

CONCLUSIONS

With the objective of assessing the suitability of the HPI as an alternative to interest rate to benchmark the Islamic home financing products, this study

conducted a series of empirical testing to determine the relationship between HPI and selected macroeconomic and housing indicators. While the simple correlation results suggest significant relationships between the HPI and most of the indicators, it was shown to have a significant and negative relationship with housing loan. Similarly, the results of the short run ARDL bounds test suggest that the HPI was strongly related to the macroeconomic indicator and supply-side indicators, but not with the demand side indicator, namely housing loan. However, the results of the long run ARDL bounds test seem to indicate otherwise. The HPI showed positive and significant long run relationship with housing loan, while the long run relationship with GDP was significantly negative.

Due to the puzzling relationship between the HPI and the selected indicators, it is suggested that the HPI by itself is not a reliable indicator to price the Islamic home financing. However, since it was shown to have the expected significant relationship with the macro-economy and housing market indicators, especially in the short run, it is fair to include the HPI in other possible alternative to the benchmark index. In particular, since many scholars have suggested the adoption of the rental index to price the MM home financing, both the rental rate and HPI are included in arriving at the rental index (Abdul Razak & Meera, 2009). Thus, this study lends support to the use of rental index as the alternative to interest rate in benchmarking Islamic home financing.

Another important finding of this study is the ability of the HPI to be an indicator to predict the possibility of housing bubbles. Specifically, positive and significant relationship between HPI and housing loan (as the housing demand indicator) suggests that the increase in demand for housing is supported by the increase in housing loan, resulting in an increase in HPI. This study highlights that the housing market is significantly influenced by bank loans, thus an expansion of the housing market fuelled by availability of credit would result in speculative activities resulting in the danger of a housing inflation or housing bubbles. Realizing this, policymakers need to take pre-emptive steps and institute appropriate policy to reduce speculation activities in the housing market that are detrimental to the overall economy.

Despite the positive developments such as HPI, the financing challenge of today includes the continued urbanisation by upgrading the environments of housing and facilities. This study contends that resolution requires not only financial improvement but also good governance and political vow. This study contributes towards providing further support to the adoption of non-interest rate benchmark for Islamic home financing. Currently, the interest rate is being used as the benchmark in pricing the financial product is arbitrarily set based on the availability of credit in the economic system, with no clear link to the value of the property. The use of non-interest benchmark will result in a more stable price movements based upon the real value of property. For financing activities, the

benchmarks may vary according to the real sectors and products concern. The benchmark that is derived from a real sector of economy prevents disputes and arguments among the parties involved in the pricing of financial products. It also brings the honesty in the banking business with the transparency of benchmark used in determining the price. Thus, it boosts the level of trust and confidence of the society to the Islamic financial system.

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