

House Price Index as an Alternative Pricing Benchmark for Islamic Home Financing: Evidence of Malaysia

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Abstract— The pricing benchmark is usually used as a guide to calculate the rate of return of the financing. In the case of Malaysia, it is not known whether residential property values have significant relationship with the general performance of the economy. We propose that the house price index to be a viable benchmark of the real values of property to determine the price of Islamic home financing product. This study compares two models; the existing pricing benchmark which relies on interest rate and the alternative pricing benchmark which relies on the house price index. It examines the long-run relationship of the two benchmark rates with selected macroeconomic variables. By comparing the interest-based benchmark with the non-interest benchmark, this study attempts to highlight the sensitivity of the two benchmarks to the real economic conditions. Focusing on quarterly data covering the period from 2001 to 2014, the study finds that the non-interest benchmark, House Price Index have significant long-run relationships with the macroeconomic variables. It shows that this alternative benchmark has the connection to the economic movements that lead to the stability of the non-interest financing instruments. The findings of this study would provide important insights on the viability of the Housing Price Index as the alternatives to benchmark of the Islamic financing home financing product. This study contributes to the empirical evidence for the feasibility of adopting interest-free benchmark to price Islamic home financing product.

Keywords – Pricing Benchmark, Islamic Home Financing, House Price Index.

I. INTRODUCTION

In the current socioeconomic setting, home ownership is considered as a form of basic need for human being to enable them to lead a decent life. However, due to the high cost of housing, not everybody can realize the dream of owning a house. The process of home ownership can be relatively more challenging for the observing Muslims who refrain from the conventional banking arrangement which is based on the prohibited element of interest rate. Despite this, the conventional banking home financing products have been adopted for so long in many countries since the money lending model of conventional finance is simple. In facilitating home ownership, the conventional banks play the role as an intermediary, collecting funds from the surplus units, then allocating the funds to those who wish to purchase a home. The bank generates revenue by requiring payment of the principal with a certain amount of interest, and as a precautionary measure, the bank keeps the house as the

collateral until the loan is fully paid by the customer. For the Muslims, this credit arrangement is prohibited based as interest on money-based loan is not permissible.

For the Muslim home purchasers who adhere to the principles of *Shariah*, the conventional home financing is not a choice for them as Islam prohibits the payment and collection of *riba*. In the contemporary system, *riba* is commonly interpreted as interest. The *Shariah* also prohibits *gharar*, generally interpreted as excessive uncertainty. In response to these prohibitions, the Islamic financial institutions developed several concepts of contracts for carrying out interest-free home financing transactions. However, the Islamic financial institutions face the challenge to be creative and innovative in providing a home financing product that is both appealing (in terms of pricing) to the Muslim customers as well as able to fit into the requirements (in terms of free from the prohibited elements or, *Shariah*-compliant) of the observing Muslims.

Islamic home financing has been the primary business of the retail Islamic banks [22]. Over the years, consumers have realized the benefits of using Islamic home financing, which include *Shariah*-compatibility, convenience and competitive pricing [4,2]. For the Islamic banks, this facility is one of the main sources of income and an important growth indicator. Based on the practices of the Islamic financial institutions globally, Islamic home financing is offered based on the concepts of sales (*Murabahah*), diminishing partnership equity financing (*Musharakah Mutanaqisah*) and lease purchase model (*Ijarah Muntahiya Bittamlik*). However, in all these contracts, the interest rate has been adopted as the pricing benchmark amid the absence of an Islamic benchmark rate.

The paper aims to assess the viability of alternative pricing benchmarks for Islamic home financing. The benchmarks should be acceptable from a *Shariah* perspective as an alternative to interest-based rates to determine the profit margins. This paper would specifically determine the long run relationship of lending rates and house price index with key macroeconomic variables using the Auto-Regressive Distributed Lag (ARDL) model.

The paper is organized in the following manner; the immediate section examines the Islamic home financing industry and then discusses the issue of pricing benchmark of financial product. The next section examines the empirical evidence among the lending rate and house price index as the alternative rates to benchmark the pricing of Islamic home financing.

II. LITERATURE REVIEW

A. Overview of Malaysia's home financing market

In Malaysia, the mortgage financing industry has expanded at a fast rate due to the strong demand from the home buyers. The development in the housing market is due to the high demand for houses in the market for the residential sector. Malaysia is the largest Islamic finance markets with Islamic assets amounted to USD365 billion as at first half of 2014, of which the Islamic home financing has been a major contributor. Over the years, Islamic home financing contributes to 24.5 percent to Islamic banking's total financing according to Bank Negara Malaysia report on November 2014.

Most financial institutions in Malaysia offer the mortgage loan by direct borrower-lender relationship. While there are more than fifteen Islamic home financing products offered in Malaysian market, the majority of the Islamic banks offer sales-based Islamic home financing products and in fact, Malaysia has been well known for offering the *Murabahah* - type of home financing over the years. This concept, however, has been accused of merely replicating the conventional home loan by replacing interest rate with profit rate. Critics have labelled this replication as a sort of manipulation carried out by Islamic banks [10].

Figure 1 below shows the Islamic financing by purpose as at November 2014. It is important to highlight that financing for residential purpose comprised of a major portion of total financing in Malaysia at 24.5 percent.

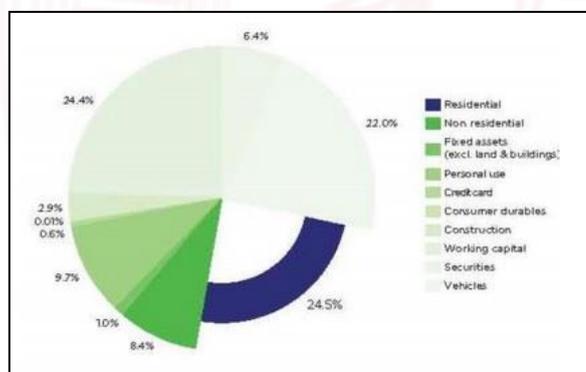


Figure 1. Islamic financing by purpose in Malaysia as at November 2014

Source: MIFC (2015)

B. Pricing Benchmark for Islamic Home Financing

i. Lending Rate

In the current practice of the financial market, interest rate is used as the benchmark rate to determine the pricing of financial products. The benchmark is used as an indicator or a guide to determine the price of the financing products. Using the lending rate to benchmark the pricing of financial products has been practice of the conventional ever since the existence of the financial institutions. Currently, major interest rates such as the Base Lending Rate (BLR) and Kuala Lumpur Interbank Offered Rate (KLIBOR) are

widely used as reference rates by the Islamic financial institutions to benchmark a broad range of financial products and contracts. The Islamic financial products benchmarking the same comparisons as the term used is financing rate. Using the interest rate as a pricing benchmark for the Islamic financial products is permissible (halal) but not desired [24]. Similarly, according to Taqi Usmani [15]:

“Although not ideal, it is certainly halal to use the prevailing interest rate as a benchmark for this rate. The criterion for acceptability by the Shariah is that the transaction be compliant with the Shariah, regardless of the price of the goods or how that price is determined”.

The Islamic financial providers acknowledged that the use of multiple sales mimic the amortization schedule of a conventional mortgage. The transaction is deemed no different from an interest-bearing loan and as argued by El-Gamal [25], the transaction is not materially different from secured lending. There have been many criticisms against Islamic banking and finance for depending on the conventional interest rate benchmark. Many contemporary Muslim scholars have been calling to initiate an independent benchmark pricing for Islamic banks [12,15]. The OIC Fiqh Academy during the 8th Conference in Jeddah on 10-11 April 1993 has unanimously passed resolutions to promptly create a new benchmark which is acceptable from a *Shariah* perspective as an alternative to interest based rates to determine the profit margins.

ii. House Price Index

The fundamental reason for introducing a new benchmark as an alternative to interest based borrowing and lending benchmark is the prohibition of *riba* itself. Usmani [15] advocates that Islamic banks and financial institutions should not be relying on the practice of using the conventional interest rates to benchmark financial products as soon as possible. He argues that using interest rates as a benchmark for halal business is not desirable. His further argument that the interest rate does not advance the basic philosophy of promoting Islamic economy, whereby making it no impact on the system of distribution. The alternative pricing benchmark should be based on the risk profiles of the real economic ventures. It must be tied to the movement of the real economy and based on productivity and profitability of assets [17].

Thus, this study analyzes the viability of employing the House Price Index (HPI) as an alternative pricing benchmark to interest rate for Islamic home financing. The HPI represents the movement of house price and overall performance housing market. It indicates how much the house price changes over time. Several studies have been conducted to study the relationship between the macroeconomic factors with respect to house prices. The researches explore the relationship based on macroeconomic factors that affect the movement of housing prices [26, 5]. The finding reveals the gross domestic product rate has significant relationship with the movement of HPI. Therefore, the study is aimed to examine the dynamic interactions of the two models, lending rate and house price index with macroeconomic factors. Comparing these models would reveal the most suitable indicator for a pricing benchmark of Islamic home financing, or simply which indicator has a significant relationship to the movement of the real economy.

Figure 2 below illustrates the plots of the benchmark rates, namely the Base Lending Rate (BLR) and HPI, as well as the selected macroeconomic variables, namely Gross Domestic Product (GDP), Consumer Price Index (CPI), and 3-month Treasury Bill Rate (TBR). The BLR shows fluctuation of rate from year to year, and showed significant decline in 2008 during the Asian financial crisis. The TBR also shows the similar pattern as the BLR with large fluctuations particularly in 2008. Comparing the BLR with the HPI, the plots show that the HPI has been less volatile and more stable as compared to the BLR.

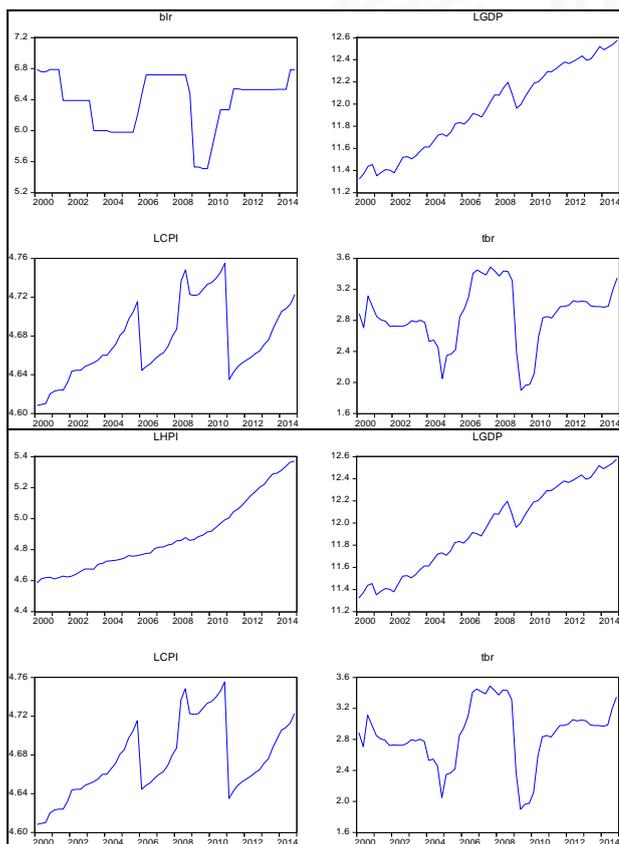


Figure 2. Plots of BLR, HPI and Selected Macroeconomic Indicators

III. METHODOLOGY

A. Data Specification

In order to achieve the objective of comparing the conventional interest rate and HPI in benchmarking the Islamic home financing, this study considers two models: the first model with the BLR as the dependent variable and the second model with HPI as the dependent variables. The selected macroeconomic indicators are included as the independent variables and the objective of the analysis is to determine which of these two indicators are more reflective of the macroeconomic indicators. The study employs quarterly data for the period 2001: Q1 to 2014: Q4, a period of 14-year, with a total of 56 data frequency.

The HPI data are sourced from the Valuation and

Property Services Department of Malaysia’s Ministry of Finance through its quarterly publication; Malaysia Property Market. The report is available in annual and quarterly data with the aggregate house price index. While another model in this study employed the lending rate, which is measured by the BLR. The BLR data are sourced from Bank Negara Malaysia’s Quarterly Bulletin and of various issues.

There are three selected macroeconomic variables in this analysis, namely Gross Domestic Product (GDP), 3-month Treasury Bill rate (TBR), and Consumer Price Index (CPI). The data are gathered from Bank Negara Malaysia’s Quarterly Bulletin and of various issues. Real GDP is used as a measure of real income while CPI is used as a measure of inflation condition. Finally, the study employs the TBR as a measure of the market interest rate. These data are obtained from BNM Monthly Statistical Bulletin of various series. All variables are expressed in natural logarithm except for BLR and TBR.

Table 1 provides descriptive statistics of quarterly changes in lending rates and real house prices, real GDP, real CPI and in TBR. The simple correlations are also provided. BLR has high variability as the mean shows 6.380 as compared to HPI 4.88. The BLR is positively correlated to TBR (0.862) and negatively correlate to CPI (-0.415). Note that BLR is not significantly correlated to HPI and GDP. While the correlation analysis shows that the HPI is highly correlated to GDP (0.948) and has a moderate correlated to CPI (0.444).

	BLR	HPI	GDP	CPI	TBR
Mean	6.380	4.880	11.949	4.675	2.861
Max.	6.79	5.37	12.58	4.76	3.49
Min.	5.51	4.58	11.32	4.61	1.90
SD	0.365	0.227	0.387	0.039	0.393
BLR	1				
HPI	0.136	1			
GDP	0.078	0.948**	1		
CPI	-0.415**	0.444**	0.574**	1	
TBR	0.862**	0.231	0.254	-0.167	1

Notes:

(1) BLR is base lending rate, HPI is real aggregate house price index, GDP is real Gross Domestic Product, CPI is consumer price index, TBR is 3-month Treasury bill rate
 (2) * and ** denote significance at the 5% and 10% levels, respectively

Table 1. Result of descriptive statistics and correlations

B. Methodology

Time series analysis explains the patterns or behavioral data throughout the period of observation with ‘stochastic process’, which the sample randomly taken and represents the series of data. This study employs multivariate time series analysis based on Auto-Regressive Distributed Lag (ARDL). The regression model includes the current and also the lagged (past) values of the explanatory variables (the X’s) which called a ‘distributed-lagged model’. And the model includes one or more lagged values of the dependent variable among its explanatory variables which called an ‘autoregressive model’ [9]. 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 co-integration procedures [19].

The model selects using the model selection criteria, such as the adjusted R2, 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 co-integration analysis. The ARDL models used in this study can be written as the following general models:

$$BLR_t = \alpha_0 + GDP_t + CPI_t + TBR_t + \epsilon_t \quad (1)$$

$$HPI_t = \alpha_0 + GDP_t + CPI_t + TBR_t + \epsilon_t \quad (2)$$

where LR and HPI are the lending rate respectively, while the macroeconomic variables employed are real GDP, consumer price index (CPI) and interest rate (three-month TBR).

The Error Correction Model (ECM) integrates the short-run dynamics with the long-run equilibrium, without losing the long-run information. The error-correction representation of the ARDL models can be written as:

$$\begin{aligned} \Delta BLR_t = & \alpha_0 + \sum_{i=1}^{p_1} b_i \Delta BLR_{t-i} + \sum_{i=0}^{p_2} c_i \Delta \ln GDP_{t-1} + \sum_{i=0}^{p_3} d_i \ln CPI_{t-i} \\ & + \sum_{i=0}^{p_4} e_i \ln TBR_{t-i} + n_1 BLR_{t-1} + n_2 \ln GDP_{t-1} + n_3 \ln CPI_{t-1} + n_4 TBR_{t-1} + v_t \end{aligned} \quad (3)$$

$$\begin{aligned} \Delta \ln HPI_t = & \alpha_0 + \sum_{i=1}^{p_1} b_i \Delta \ln HPI_{t-i} + \sum_{i=0}^{p_2} c_i \Delta \ln GDP_{t-1} + \sum_{i=0}^{p_3} d_i \ln CPI_{t-i} \\ & + \sum_{i=0}^{p_4} e_i \ln TBR_{t-i} + n_1 \ln HPI_{t-1} + n_2 \ln GDP_{t-1} + n_3 \ln CPI_{t-1} + n_4 TBR_{t-1} + v_t \end{aligned} \quad (4)$$

where:

BLR : base lending rate

lnHPI : natural logarithm of house price index

lnGDP : natural logarithm of gross domestic product

lnCPI : natural logarithm of consumer price index

TBR : interest rate (three-month TBR)

The second model, HPI is tested with real, aggregated House Price Index. The terms with the summation signs in the above equation represent the error-correction dynamics, while the second part (terms with ns where s=1, 2,3,4)

corresponds to the long-run relationship. In the ECM model, the null hypothesis (H0: n1= n2= n3= n4=0), which indicates the non-existence of the long-run relationship, is tested against the existence of a long-run relationship. The calculated F-statistics of the H0 of no co-integration is compared with the critical value. If the computed F-statistic falls above the upper-bound critical value, the H0 of no co-integration is not accepted. However, if the test statistic falls below a lower bound, the H0 accepted. Finally, if it falls inside the critical value band, the result would be inconclusive. Once co-integration is confirmed, the long-run relationship between the BLR or HPI and macroeconomic variables using the selected ARDL models are estimated. The last step of ARDL is to estimate the associated ARDL ECM. Finally, to ascertain the goodness of fit of the selected ARDL model, the diagnostic and the stability tests is conducted.

IV. FINDING AND ANALYSIS

Prior to the testing of co-integration, a test of order of integration is conducted for each variable using Augmented Dickey-Fuller (ADF) and Phillip Perron (PP) as reported in Table 2. The unit root test would indicate whether or not the ARDL model is a suitable analysis of the data given [8]. Both tests in agreement in suggesting non-stationarity or I(1) property of all variables. Base lending rate, house price index, gross domestic product and consumer price index are found to be stationary in first differences by both tests. Meanwhile, the ADF test establishes the I(0) property of treasury bill rate while PP test suggests its stationary at I(1). The result shows the summary of unit root test which lead to the mixture of I(0) and I(1) of underlying regressors and therefore, the ARDL testing could be proceeded.

Further of the study, the co-integration test is performed on lending rate and house price index with macroeconomic indicators; gross domestic product, consumer price index and treasury bill rate. The equation 3 and 4 are estimated to examine the short-run and long-run relationships among the variables; BLR and HPI with macroeconomic variables. As suggested by Pesaran et. al. [20] and Narayan [11], the maximum order of lag length of 5 is selected in this study since the data employed is in quarterly basis. This study used the Schwartz Criterion (SC) to determine the optimal number of lags to be included in the conditional ECM (error correction model). The F-statistics are computed for the joint significance of lagged levels of variables as in equation (3) and (4). The critical value is reported together in the Table 3 which is based on critical value suggested by Pesaran, Shin & Smith [21] and Narayan [11] using small sample sizes between 50 and 60. The long run co-integration hypothesis are tested between LR, HPI, GDP, CPI and TBR.

The null hypothesis of no co-integration of BLR as dependent variable of Model 1, is rejected at the 1 percent level since the computed F-statistic is greater that critical value given by both Pesaran et. al. [21] and Narayan [11]. The F-statistics of LR is 7.181 which is greater than the critical values (Pesaran, Shin & Smith at 1%: 5.61 and Narayan at 1%: 5.25). While for Model 2, the null hypothesis of no co-integration is rejected at the 1 percent level. The F-statistics of HPI is 6.83 which is greater that critical values given (Pesaran, Shin & Smith at 1%: 5.61 and Narayan at 1%: 5.25). On the other

hand, the null hypothesis of no co-integration in regard to other equations with GDP, CPI and TBR as dependent variables is not rejected. The empirical results of the long-run ARDL model are presented in Table 4. The significant variables which appear to affect the lending rate are GDP, CPI and TBR.

	Level		First Difference	
	ADF	PP	ADF	PP
BLR	-2.584	-2.333	-5.668***	-5.669***
HPI	4.042	4.043	-5.944***	-6.288***
GDP	0.048	-0.163	-8.297***	-11.541***
CPI	-2.264	-2.270	-7.884***	-7.932***
TBR	-2.716*	-2.435	-5.546	-5.607***

Note: The lag order in the ADF and PP tests are based on the SIC.

** and *** denote significance at 5% and 10%, respectively.

Table 2. ADF and PP unit root tests

Therefore, this paper analyzes the viability of non-interest benchmark, namely the HPI as the alternative to lending rate in determining the price of home financing. The result shows both models, LR and HPI are comparable since both are significant. The F-statistics for LR is 7.181 which is more than upper bound value for Pesaran, Shin & Smith and Narayan tables. While the F-statistics for HPI is 6.827 also exceed the upper bound value for Pesaran, Shin & Smith and Narayan tables.

A recent study conducted by Ibrahim & Law (2014) which examine on the long run behavior of house prices and the dynamic interactions with bank credits, real output and interest rate. The study analyzes co-integration, causality and vector autoregressions (VARs) for Malaysia environment. The researchers empirically explain that terraced house price index forms a long run relation with bank credits, real output and interest rate. Hence, this literature supports this paper on the long-run relationship of house price index with macroeconomic indicators; gross domestic product, consumer price index and treasury bill rate.

		Dependent Variables	Computed F-statistic	
Model 1: LR		LR	7.181328***	
		GDP	0.292545	
		CPI	1.759570	
		TBR	6.660070***	
Model 2: HPI		HPI	6.826906***	
		GDP	0.182439	
		CPI	1.733310	
		TBR	3.899489*	
Pesaran, Shin & Smith ^a			Narayan ^b	
Critical Value	Lower bound value	Upper bound value	Lower bound value	Upper bound value
1%	4.29	5.61	4.068	5.250
5%	3.23	4.35	2.962	3.910
10%	2.72	3.77	2.496	3.346

Notes: *, ** and *** indicate significance at 10%, 5% and 1% levels, respectively.

^a Critical values are obtained from Pesaran, Shin and Smith (2001)

^b Critical values are obtained from Narayan (2004), Table case III: unrestricted intercept and no trend

Table 3. Bounds test results

The result of this analysis support the previous studies on the relationship in short-run and long-run periods between Islamic financial development and economic growth. Abduh & Azmi [1] conducts an empirical study and finds that Islamic finance development have a significant relationship with Indonesian economic growth in the short-run and the long-run and both has a bi-directional relationship. It is significant to the Islamic finance industry to grow with real economic activities.

	Model 1: Lending rate	t-statistics	Model 2: HPI	t-statistics
C	13.441	3.442***	41.212	0.3541
GDP	0.244	2.368***	3.819	0.417
CPI	-2.531	-2.715***	-16.668	-0.366
TBR	0.633	7.572***	-0.791	-0.357

Table 4. Long-run ARDL model estimates

V. CONCLUSION

There is enormous demand for Islamic banking and financial services. This translates into a potential increasing demand for financial services for homes, automobiles and businesses. In order to succeed in reaching this huge demand for Islamic banking and finance, much work should be done to educate the industry players and customers regarding both the need and the demand for such services. The key to reaching the desired level of Maqasid Shariah is moving away from benchmarking interest/lending rate to an alternative benchmark which this paper is empirically tested the correlation among these variables. Although benchmarking against the conventional interest rate is permissible, but it is a need to model an alternative benchmarking for the Islamic home financing based on the Malaysian case.

The main significance of carrying out this research is that it addresses important gaps in current knowledge and existing literature on alternative benchmark of home financing product, which appose to the current practice of benchmark. For instance, the most fundamental level, there is little studies at present on the viability of benchmark to a real economic condition in relation to the movement of trends in real economic activities. Therefore, using indices for guidance in measuring the rate of return that relate to real transactions is permissible in Shariah. The analysis from this study should help to shed light in these areas. This study would recommend on future studies to adopt four sub-indices of house price index corresponding to various types of houses, namely, Terraced Houses (HT), Semi-Detached Houses (HS), Detached Houses (HD) and High-Rise Houses (HH) by different location across the study period. It would be more enriching analysis to arrive at more robust findings of the alternative benchmark for pricing mechanism of Islamic home financing.

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