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THE ARTIFICIAL NEURAL NETWORK MODEL (ANN) FOR MALAYSIAN HOUSING MARKET ANALYSIS

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Abstract

The Hedonic Model, a traditional method for forecasting house prices has been criticised due to nonlinearity, multicollinearity and heteroskedasticity problems, which were argued to affect estimation accuracy. Unlike the Hedonic Model, the Artificial Neural Network Model (ANN), permits nonlinear relationships and thus avoids the problems plaguing the Hedonic Model resulting in superior forecasting performance. Despite these advantages, attempts to model house prices using ANN are limited in geography and data thus besetting the usefulness of the results. To address the research gap, this paper aims to establish such a new model using ANN in forecasting house prices. A sample of double-storey terraced houses transacted in Johor Bahru are analysed using ANN. The findings illustrate a superior forecasting performance for ANN through high values of goodness of fit and low values of errors. This paper adds to the house price modelling literature and provides new knowledge to both academics and practitioners.

Keywords: Artificial Neural Network Model, Hedonic Model, house price forecasting

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INTRODUCTION

A popular and dominant method for forecasting house price movements has always been the Hedonic Model (McCluskey, Cornia, & Walters, 2012; Moore, 2006; Asmawi, Mohit, Noor, Abdullah, & Paiman, 2018). This is due to its ability in allowing changes in quality for various attributes influencing house prices. Nonetheless, this model received criticisms due to exposure to the violation of the classical model, namely: nonlinearity, multicollinearity and heteroskedasticity (Antipov & Pokryshevskaya, 2012; Kilpatrick, 2011; Peterson & Flanagan, 2009). Such exposure will lead to inaccuracy in the prediction of house prices.

Multicollinearity, for instance, causes high variances and specification errors (Kennedy, 2003). Heteroskedasticity may cause biased estimates, resulting in unreliable hypothesis testing (Studenmund, 2006). Meanwhile, autocorrelation causes biased and inefficient estimators with large prediction errors (Adi Maimun, 2011). Limitations in the current Hedonic Model beset the usefulness of the results in forecasting house prices. Inaccurate house price prediction will negatively affect the decision making of many parties including policy-makers and developers. Due to these disadvantages, many researchers attempted to apply other models in place of the Hedonic Model.

Out of the vast array of models, the Artificial Neural Network Model (ANN) was identified to be able to address the problems of the Hedonic Model, such as nonlinearity and multicollinearity (Tabales, Ocerin, & Francisco, 2013). The most significant strength of ANN is that it may represent any relation between the dependent and independent variables, including linear and nonlinear. Secondly, ANN has a self-learning ability which allows it to analyse a significantly large amount of data, test for the discovery relationship or connections among the data, and use the discovered data for predictions of future trends or events (Mohd Radzi, Muthuveerappan, Kamarudin, & Mohammad, 2012).

Due to these strengths, ANN has been used for various purposes including estimation, forecasting, and classification across a variety of disciplines like psychology, genetics, linguistics, engineering, computer science and economics. Nonetheless, the application of ANN in real estate only began in the 1990s through the works of Borst (1991), Do and Grudnitski (1992), Tay and Ho (1992), Kathman (1993), Collins and Evans (1994), Worzala, Lenk and Silva (1995), McCluskey, Dyson, McFall and Anand (1996), Rossini (1998), and Bonissone and Cheetham (1997). These house pricing studies have shown superior forecasting performance for ANN compared to the traditional method (i.e. Ordinary Least Squares or OLS).

Despite the many advantages of ANN, only studies from developed countries have explored ANN in forecasting house prices. Very few ANN house price studies came from developing countries (Mooya, 2015; Abidoye & Chan,

2016, 2017). To cope with the fast changing and high demand for property valuation services (Taffese, 2016), it is crucial for real estate professionals to employ artificial intelligence in performing property valuation services (Yalpir, 2014).

This paper begins with a theoretical review of the foundations of ANN followed by previous studies that have utilised ANN in modelling house prices. It then describes the methodology of the study followed by a discussion of the findings before concluding the study.

THE ARTIFICIAL NEURAL NETWORK MODEL (ANN)

The ANN is inspired by the neural architecture of the human brain by attempting to loosely simulate its functioning (Do & Grudnitski, 1992). In this context, what is simulated is the way human brain cells or natural neurons produce specific activity as a reaction to inputs from other brain cells or sense organs. The output can be transported through other neurons (Kathman, 1993).

In ANN, nodes are used to represent the brain's neurons, and these nodes are interconnected in layers of processing. ANN consists of three interconnected node layers: the input, hidden, and output layers. The input layer contains data from the measures of explanatory or independent variables. This data is passed and processed through the nodes of the hidden layer(s) to the output layer, which represents the dependent variable(s). The ANN equation is formulated as follows:

$$Xjj = \text{Total } WijYi$$

where:
Xj is the net input to the artificial neuron (*j*).
Yi is the value of the input signal from an artificial neuron (*i*).
Wij is the weight from an artificial neuron (*i*) to the artificial neuron (*j*).
n is the number of input signals to the artificial neuron (*i*).

The output from an artificial neuron (j) is a function of the transfer function as follows:

$$Oj = f(Xj)$$

where;
Oj is the output signal from an artificial neuron (*j*).
f(Xj) is the transfer function of the artificial neuron (*j*).

PREVIOUS STUDIES USING ANN

Previous comparative house price modelling studies by Cechin, Souto and Gonzalez (2000), Nguyen and Cripps (2001), Wong, So and Hung (2002),

Limsombunchai, Gan and Lee (2004), Özkan, Yalpır and Uygunol (2007), Pagourtzi, Metaxiotis, Nikolopoulos, Giannelos and Assimakopoulos (2007), Ng and Skitmoreb (2008), Selim (2009), Peterson and Flanagan (2009), Khashei and Bijari (2010), Lai (2011), Amri and Tularam (2012), and Abidoye and Chan (2018) demonstrate the superiority of ANN in forecasting performance compared to the traditional Hedonic Model. Specifically, these studies illustrate a lower forecasting error for the ANN (between five percent and ten percent) compared to the Hedonic Model, which demonstrates a more substantial error (between ten percent and fifteen percent). Moreover, there is also evidence showing more realistic marginal prices resulting from the ANN compared to the traditional Hedonic Model (Tabales et al., 2013). Abidoye and Chan (2017) provide a comprehensive review of ANN applications in estimating property prices.

Despite the growing interest in ANN around the world, there is very limited ANN property price modelling research in Malaysia. To the author's knowledge, the current Malaysian study is limited to only Mohd Radzi et al. (2012). While high predictive performance (large adjusted R squared and low mean absolute percentage error) was observed in the study, the authors did not attempt to compare the ANN's performance with the Hedonic Model. They thus left the question of how accurate the model was in predicting Malaysian house prices unanswered. Moreover, the authors also employed macro variables (unemployment rate, population size, mortgage rate and household income) rather than micro variables (location, age of building, size of land, size of building, type of land interest and type of ownership) in modelling house prices. The employment of macro variables rather than micro variables besets the usefulness of the results in estimating the true value of property prices.

Limitations of the current Hedonic Model coupled with limited literature on ANN property price modelling in Malaysia highlight the necessity of this study. Thus, this research aims to evaluate ANN in forecasting house prices. Having stated the research aim, this study attempts to answer the following research questions; What is ANN? How do we construct the ANN? How good is the ANN in forecasting house prices? Due to its good estimation and prediction performance reported by previous studies, this research anticipates superior prediction performance for ANN.

METHODOLOGY

A total of 2,325 double storey sale transactions spanning from year 2000 to 2016 in Mukim Pulai, Johor Bahru were acquired from the Valuation and Property Services Department Johor Bahru (VPSDJB). Only house attributes theorised to affect the property prices were extracted from the dataset. Dataset was cleansed prior to analysis to remove outliers. Samples were discarded based on these criteria; (1) sales transaction over RM233,800.00, (2) land area over 146.03 square metres, (3) main floor area over 137.64 square metres, (4) transaction

years between 2013 and 2016 and (5) incomplete information. The cleansing process reduced the sample to a total of 640 observations for training and prediction. Transaction price, measured in RM per unit, was used as the dependent variable. Meanwhile, land area and main floor area measured in square metres were used as independent variables.

A feed-forward structure with one hidden layer was applied in this study. The neural network was then trained using a back propagation algorithm to adjust the weight and thresholds of the network to minimise forecasting errors in the training set. Datasets were split into three sets: training, testing and validation dataset. Out of 215 datasets, 193 datasets were used for training (years 2000 to 2010), 22 datasets were used for prediction (years 2011 to 2013) and validation separately.

In this paper, the learning and momentum rates were determined through five phases of trial-and-error. A series of trial and error process was performed by identifying the number of hidden neurons randomly, starting with the smallest (one) to the largest number (five). Training and testing were executed by increasing hidden neurons after each training and testing process. The network minimised the difference between the given output and the prediction output monitored by the minimum average error while the training process was conducted. A decrease in value will minimise the error. This process continued until 30,000 cycles of test sets were achieved. The result of this process suggests that the best neural network to forecast Johor Bahru house prices is 2-1-1 (2 indicates the number of neurons in input layer, 1 number of neurons in hidden layer and 1 number of neuron in output layer) with 0.0.1 learning rate and 0.1 momentum rate. **Figure 1** illustrates the neural network topology of this study.

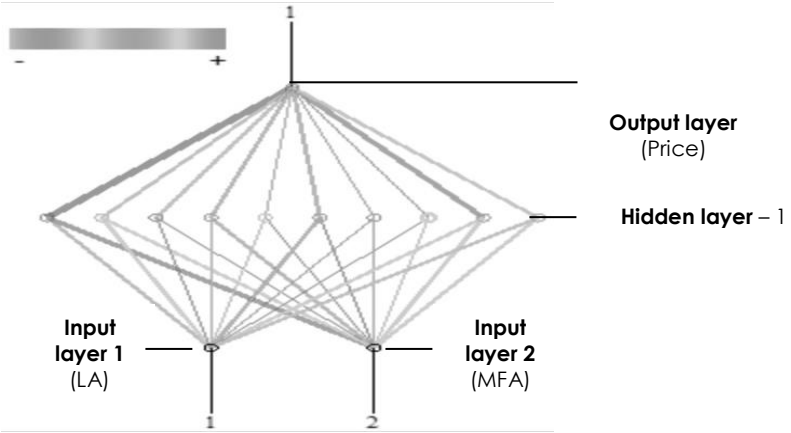

Figure 1: Neural network topology

The validation test was implemented after the network output under prediction sets are transferred into validation sets. The validation test examined the performance of ANN in forecasting local house prices. The validation process was performed by comparing the actual and forecasted values for years 2009 to 2011. The performance of the ANN is evaluated through statistical tests, namely Mean Absolute Deviation (MAD), Mean Absolute Percentage Error (MAPE) and Root Mean Squared Error (RMSE). Low MAD, MAPE and RMSE values produced by the ANN indicate good predictive performance.

RESULTS

The performance of ANN was assessed by observing the values of R^2, MAD, RMSE and MAPE for two sets of selected housing schemes, namely Taman Mutiara Rini and Taman Bukit Indah (Table 1). All statistical tests indicated good fit. Both sets in these two housing schemes produced high R^2 with low values for MAD, RMSE and MAPE.

Superior goodness of fit was observed for Sets 1 of Taman Mutiara Rini and Taman Bukit Indah having a higher value of R^2 at 0.99 and 0.93 respectively. Meanwhile, the MAPE showed a percentage error of 4.41% and 4.55% for Sets 1 and 2 of Taman Bukit Indah respectively, both with less than the 10% error threshold. This implies that the ANN is able to predict house prices with low errors. However, Taman Mutiara Rini datasets showed slightly higher MAPE with 14.32% for Set 1 and 16.31% for Set 2. The results suggest that models with large sample sizes (Sets 1 of Taman Mutiara Rini and Taman Bukit Indah) have superior performance compared to models with small sample sizes (Sets 2 of Taman Mutiara Rini and Taman Bukit Indah).

Table 1: Summary of regression results

	Set 1				Set 2			
	R^2	MAD	RMSE	MAPE	R^2	MAD	RMSE	MAPE
Taman Mutiara Rini	0.99	0.10	0.11	14.32	0.96	0.12	0.13	16.31
Taman Bukit Indah	0.93	0.03	0.04	4.41	0.89	0.04	0.04	4.55

CONCLUSION

This paper examined the capability of ANN in forecasting house prices in Johor Bahru. Overall, the findings concluded that ANN is capable of forecasting highly accurate house prices as measured through R^2, MAD, MAPE and RMSE. This finding supported the work of Tabales et al. (2013), Abidoye and Chan (2018), and many others who concluded superior prediction performance for ANN. Higher performance was also observed for models with large numbers of datasets.

This supported the notion by Tabales et al. (2013) who claimed that ANN produced better results with larger sample sizes. Validation tests performed for large and small sample sets illustrated a superior predictive performance measured through R^2, MAD, MAPE and RMSE for large datasets. Overall, the findings of this study has achieved the aim of the study, which was to evaluate ANN in forecasting house prices. This study contributed to the body of literature on modelling house prices using artificial intelligence model. The findings of this study guide both academics and practitioners on ANN applications in forecasting accurate real estate prices. This research can be extended to include more house price determinants to obtain a more accurate house price forecast. In addition, further research may also attempt to compare other house price models such as the Hedonic Model with ANN. In doing so, the predictive performance can be measured and ascertained across different types of models.

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THE DYNAMIC OF VOLATILITY OF PAN-ASIAN PROPERTY PORTFOLIO MARKETS

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Abstract

The securitised market in Asia has become more progressive recently, especially with the introduction of Real Estate Investment Trusts (REITs). The financial crisis such Global Financial Crisis has put the Asian property market into a convenient means to invest because of their sustained economy from that crisis. Nevertheless, the Asian property market has become more complex to understand, especially for institutional investors. As such, it is important to understand the market volatility especially the Asian property market. An understanding of volatility level especially in regional market is important to determine the cost of capital as well as to detect leverage decision and investment. Significant changes in volatility will have a significant impact to property portfolio market at the regional level. With the emergence of regional and global investors in property, it is important to answer the question on the situation of Asian property portfolio markets' volatility. Moreover, economy of each of Pan-Asian countries will also be assessed to show the significance of their economy development and provide information for investor's investment strategies from the volatility level point of view. This paper will assess the volatility level of pan-Asian property portfolio market over the period January 2000 to December 2015 by using EGARCH model.

Keyword: property, portfolio, EGARCH, Asian, volatility

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INTRODUCTION

The international investment market has opened a wider choice for fund managers and property investors. Consequently, the Asian region offers many opportunities for investment on a range of different measures. Being amongst the fastest growing economies, Asia has several national markets that have reached majority in terms of market complexity transparency and competitiveness (Nguyen 2011). According to research report by CBRE (2015), China and Singapore are two major countries as sources of capital at global investment, proving that Asian region as a major destination in terms of investment.

Most of the public listed real estate companies in Asia are involved in several aspects of the property business, mainly in property development and property investment. For property development companies, the companies should have sufficient ongoing property development projects to be able to sustain reasonable earnings for at least five years after listing (Razali, Mei, Zainuddin, & Yunus, 2016). The emergence of Asian countries as economic power has been forecasted since the 1980s, which positively impacted the property sector. The number of public listed property companies has increased significantly and played a key role in the economic growth of the nation.

The dynamic of Asian region particularly in property investment has caught investors' attention to investigate in terms of dynamic of performance and volatility. The uncertain condition of capital market has also given some significant impact to the performance of real estate companies in this region. The performance of Asian real estate companies has decreased slightly, beginning from year 2015. The FTSE EPRA/NAREIT Developed Asia Index 2015 decreased 1.8% during December 2015. The Hong Kong Index was down 1.3%, in comparison to a loss of 1.7% in Japan. The Australia Index increased by 3.8% while Singapore was up by 2.7%. At the end of December 2015, the FTSE EPRA/NAREIT Developed Asia Index counted a total of 76 constituents, representing a free float market capitalisation of over EUR 311 billion (EPRA 2015). However, Emerging Asia Pacific, such as China and The Philippines, gained 2.8% in the FTSE EPRA/NAREIT Emerging Index (EPRA 2015). Therefore, it shows that the Asian property portfolio market performance has shown some dynamic changes which depends on the country's performance in property portfolios' market.

Listed property companies have become an increasingly important investment vehicle in Asia and internationally (Steinert & Crowe 2001). Countries such as Malaysia, Korea, Hong Kong, Singapore and Japan also introduced REITs; creating higher volatility compared to other mature markets. Asian continues to play a major role in global investment particularly on source of capital.

According to Fiorilla, Kapas and Liang (2012), Asia Pacific region is forecasted to become the distribution of investable properties, as it is predicted to

grow much faster than other parts of the world. As of 2011, the region contained a total of USD 7 trillion of institutional-grade commercial properties as compared to USD 9 trillion in Europe and USD 8 trillion in the US. However, the property market in Asia is projected to grow rapidly to USD 19 trillion by 2021 and USD 45 trillion by 2031, overtaking Europe and North America to become the largest property market in the world. By 2021, it is expected to make up almost 40% of the global property market, increasing from the current level of 27% in 2011. According to Fiorilla et al. (2012), half of the world's investable property is expected to be located in the Asia Pacific region by 2031.

The rapid growth of investment in Asian region has given positive impact to property portfolio growth. During the Asian financial crisis (AFC), almost all Asian countries were severely impacted. Most of the countries underwent economic reformation arranged by the International Monetary Fund (IMF). Later during the global financial crisis (GFC), most Asian countries launched incentive package plans which significantly contributed to the recovery process. Some Asian countries were impacted mainly through the following collapse in international trade or rapid financial spill overs. As a result, many Asian economies with direct exposure to US assets, such as Singapore and South Korea, showed increased financial stress and output losses. The magnitude of the impact has been deferred greatly among countries (Claessens, Dell'Ariccia, Igan, & Laeven, 2010).

Despite the negative impact of the European debt crisis and the GFC, the Asian region remains in good and solid growth with low unemployment rates. Generally, on average the GDP were significantly higher than the rest of the world. According to IMF (2015), the outlook for Asian markets (both emerging and developing economies), and the US economy regained some momentum, with a fading drag from inventories and recovery in investments. The international investment market has opened a wider choice for fund managers and property investors. Consequently, the Asian region offers many opportunities for investment on a range of different measures. Foreign investment in this region has seen significant increases Post-GFC. The emergence of property portfolio market in Asia at the global level has changed the investment condition in this region. The market has become more integrate and volatile to each other.

The market integration or segmentation does have implications for the relationship and linkages between difference markets. Furthermore, the market integration could also affect long term implications from the co-integration of the markets. If markets are co-integrated, this implies the diversification opportunities between the markets are reduced in comparison to markets that are segmented. Financial deregulation, integration of national capital markets in periods of financial contagion have been found to strengthen interrelated markets across global property security markets. This has resulted in fund managers being active in finding additional sources of diversification. The benefits of market

integration can be seen from the available information from the dominant markets in order to predict movements of local markets. Furthermore, market integration also helps real estate exposure, which can benefit to maximise investment profits. Consequently, the integration of the market has also created uncertainties among the markets, which led to volatility and spill overs.

A growing number of previous researches in recent years have investigated aspects regarding interdependence and contagion of listed property companies, especially after the AFC as well as the GFC. For instance, Kim, Oh and Jeong (2005) assessed the increase in capital mobility among Asian countries, while Ghysels and Seon (2005) examined the contagion effect of the Asian stock market during and after the AFC. Caporale, Cipollini and Demetriades (2005) also examined similar subject matter. Meanwhile, Nguyen (2011) measured the volatility spill over of Asian listed property companies by segregating between developed and emerging markets. Nevertheless, how far the volatility level will effect in term of spill overs among pan-Asian countries' listed property companies was not discussed. Therefore, this study investigates the level of volatility within the Asian real estate market over the period from 2000 to 2015. As the market has become more integrated it is therefore important to assess the spill over effect among pan-Asian countries.

RESEARCH BACKGROUND

Real estate is gaining increasing institutional acceptance as an essential asset class due to the globalisation of real estate equity and debt investment instruments being available for other international investors in international financial markets (Liow, 2010). Furthermore, real estate also acts as capital assets that contribute to investment diversification and wealth creation. According to the modern portfolio theory, domestic and international portfolio risk can be reduced by investing in real estate due to the correlation of real estate with other investment assets is relatively low. Eichholtz, Huisman, Koedijk and Schuin (1998) found that real estate segmentation occurs between continents but integration within continents. Therefore, this will contribute to international diversification in real estate.

Studies on integration of property securitised markets have been undertaken by several researchers. For example, Liu and Mei (1998) highlighted that international public property markets are segmented. Later, Gordon and Canter (1999) investigated the cross-sectional and time series differences in correlation coefficients between property stock and broader equity indices in 14 countries. Their findings revealed correlation coefficients tend to vary over time in several countries which trended towards integration or segmentation. There is also evidence that there are high linkages between four of the largest Asia Pacific public real estate markets, such as Australia, Hong Kong, Japan and Singapore.

European public real estate markets also show high co-integration within the continents (Yang, Kolari, & Zhu, 2005).

Real estate markets are highly related to the financial markets; thus financial market volatility will impact on the risk level in the property securitised market. Market volatility is very important to policy makers. This is due to the fact that volatility levels will have a significant impact on the condition of the market. Volatility is part of the macro prudential assessment of market performance. Relatively higher levels of volatility indicate higher uncertainty regarding future cash flows and discount rates enhance future economic conditions (Danielsson, Valenzuela, & Zer, 2016). Such high volatility can therefore be seen by forward looking economic agents as a signal of the increased risk of adverse future outcomes and a pending crisis. Therefore, understanding the volatility and property security market is crucial for leveraging decisions. Significant changes in volatility will have a major impact on investors in terms of risk and return. Volatility is associated with unpredictability and uncertainty, and has a significant impact on performance as well as variance risk (Razali, 2015). Investors will see volatility as a major indicator for market symptom disruption and condition of capital markets.

Volatility has long been discussed by both academics and investors. Changes in price volatility in one market (or asset class) produce a lagged effect on volatility in other markets (or asset classes) over and above local effects is called volatility spill overs (Milunovich & Thorp, 2006). There are many research that have shown that volatility spill overs are both significant and widespread, and well identified (Cotter & Stevenson, 2006; Michayluk, Wilson, & Zurbruegg, 2006; Stevenson, 2002). Several studies have investigated the volatility relationship across property markets and found a little impact on significant evidence of cross-volatility spill overs among the Asian-Pacific markets (Garvey, Santry, & Stevenson, 2001; Nguyen, 2012; Pham, 2013; Razali, 2014). Liow (2008), Mei and Hu (2000), and Wilson and Zurbruegg (2004) have identified different findings regarding the spill over and correlation and amongst Asian property securities as these relationships vary over time. In the same way, Real Estate Investment Trust (REIT) has been significant in international volatility spill over within the Pacific region, with significant volatility transmission between the Pacific and the Atlantic regions (Li & Yung, 2007). Furthermore, Sing and Sng (2003) have found significance in the other direction but no evidence of the ex-post return of the direct property incorporating the market volatility of property securities in the context of direct and indirect property.

This research assesses the volatility spill over among property securities market of Asian countries. This research uses the exponential generalised autoregressive conditional heteroscedasticity (EGARCH) model to empirically examine the volatility spill overs of listed property companies to 11 pan-Asian country markets.

DATA AND METHODOLOGY

The volatility spill over for each of the pan-Asian listed property companies in 11 countries over the period of year 2000 to 2015 was analysed. The countries involved were Singapore, Malaysia, Japan, Taiwan, Hong Kong, China, Vietnam, Indonesia, Thailand, South Korea and The Philippines.

This research involved time varying volatility, which dataset range from year 2000 to 2015. This research used the EGARCH model to calculate volatility. The spill over volatility indices used a variance decomposition associated with an N-variable Vector Autoregression (VAR) as proposed by Diebold and Yilmaz (2009).

Unit Root and Stationary Test

This test is to examine if two or more-time series' are integrated in the same order and in a linear combination style. The augmented Dickey-Fuller (ADF) test is used to determine the existence of unit roots. The ADF test is performed using the following regression:

$$\Delta P_t = \alpha + \beta P_{t-1} + \sum_{i=2}^{m} \gamma_i \Delta P_{t-1} + e_t$$

Where, P_t is the natural logarithm of a price index. If β is not significantly different from zero, a unit root exists and the series is not stationary and vice versa.

Exponential Generalised Autoregressive Conditional Heteroskedasticity (EGARCH)

According to Engle (1982) the ARCH/GARCH classes of models are some of the most widely used on-linear models for specifying volatility. The model can capture the volatility of stock return specifically long memory, short memory, leverage effect and volatility clustering. ARCH models were introduced by Engle (1982) to specifically model and forecast conditional variances. The ARCH model assumes that the variance of the current period is an equally weighted average of the squared residuals of the previous days. The GARCH model introduced by Bollerslev (1986) uses declining weights for the squared residuals that are estimated by the model. The GARCH model uses conditional variance equation in the following form:

$$\sigma_t^2 = \omega + \sum_{j=1}^{a} \beta \, \sigma_{t-1}^2 + \sum_{t-1}^{p} a \, \varepsilon_{t-1}^2$$

Where ω, *a, β* are non-negative parameters with $a + \beta < 1$ but should be close to unity for an accurate model specification.

However, the standard GARCH model does not capture the asymmetric nature or skewness caused by the inverse correlation between volatility and returns, referred to as leverage effect. Therefore, this study employed the

Exponential GARCH or EGARCH model that was introduced by Nelson (1991) to capture the leverage effect. The specification for the conditional variance in the EGARCH model is given by:

$$\log \sigma_t^2 = \omega + \beta \log \sigma_{t-1}^2 + \alpha \left| \frac{\varepsilon t - 1}{\sigma t - 1} \right| + \gamma \frac{\varepsilon t - 1}{\sigma t - 1}$$

The benefit of using EGARCH is in the form of positivity of the parameters with the lag of the variance. Also, there are no restrictions on the parameters *ω, a, γ*. However, to maintain stationary, β must be positive and less than 1. The leverage effect is indicated by the value of γ. For the leverage effect to be present, γ must be negative and significant.

In this research EGARCH (1, 1) was used to model the volatility of pan-Asian securities' real estate indices for the time period of 2000 to 2015. Before the EGARCH models are applied, it was necessary to test for the presence of ARCH effects. This was performed by first applying the least squares (LS) method in order to generate regression residuals. Then the ARCH heteroskedasticity test was applied to the residuals to see if time varying volatility clustering does indeed exist.

Statistical analysis including the Kolmogorov-Smirnov (KS) test for normality, the autocorrelation function (ACF) and the Ljung-Box test for linear independence, and the ADF test for unit roots were applied to the pan-Asian securitised real estate indices during the period. Descriptive statistics were also generated. The two variables were monthly returns of the listed property companies and the volatility.

FINDINGS

By using the Philips-Perron test, the ADF test was used to reject the null hypothesis of unit root. Based on the model developed by Levin, Lin and Chu (2002), the ADF specification equation is as follows:

$$X_t = c + \sum_{i=1}^{p} \varphi_i X_{t-i} + \varepsilon_t$$

Where;

$\varphi_1, \ldots, \varphi_p$	= parameters of the model
c	= constants
ε_t	= error

A further unit root test is necessary to assess the existence of unit root in the listed property companies as a system. This would strengthen the weight of stationary of the system in the data series. In addition, Phillip-Perron test developed for the generalisation of the ADF test procedure that will permit mile assumption concerning the distribution of errors. The equation is similar with

those tested in ADF. The test will allow for individual unit root processes so that (Pi) vary across sections. The tests are all characterised by the combining of individual unit root tests to derive panel specific results. Table 1 exhibits the ADF and PP test for variables in log level. The results revealed that all ADF and PP tests are non-stationary. This indicates the presence of all unit roots of listed property companies in pan-Asian countries. Furthermore, it also showed that non-stationary in log level of the variables with difference in the first log. Engle and Granger (1987) mentioned that this will create the possibility of a long run equilibrium relationship. Based on the model developed by Johansen (1995), EVIEWS software was used to test this relation by implementing VAR as a base co-integration. The VAR number model of lags was based on the suggestion by Lutkepohl and Reimers (1992). Therefore, this model will create five criteria in deciding the model of the lag length. All of the criteria consist of maximum lag length equal to 4 for the VAR model to be stationary with all the roots that must modulus less than 1 inside the unit circle.

Table 1: Results of unit root test

	ADF		
	Intercept	Intercept Linear Trend	None
	Log level/log first differences		
China	0.78 (0.00)	0.16 (0.00)	0.88 (0.00)
Hong Kong	0.47 (0.00)	0.05 (0.00)	0.76 (0.00)
Indonesia	0.11 (0.00)	0.01 (0.00)	0.28 (0.00)
Japan	0.50 (0.00)	0.74 (0.00)	0.87 (0.00)
South Korea	0.86 (0.00)	0.54 (0.00)	0.88 (0.00)
Malaysia	0.44 (0.00)	0.00 (0.00)	0.67 (0.00)
The Philippines	0.92 (0.00)	0.07 (0.00)	0.93 (0.00)
Singapore	0.52 (0.00)	0.43 (0.00)	0.77 (0.00)
Taiwan	0.64 (0.00)	0.59 (0.00)	0.58 (0.00)
Thailand	0.57 (0.00)	0.45 (0.00)	0.89 (0.00)
Vietnam	0.82 (0.00)	0.58 (0.00)	0.73 (0.00)

Nelson (1991) established the exponential GARCH model known as the EGARCH model to assess conditional kurtosis in returns of listed property companies. This downward movement will be more influential in predicting volatility than the upward movement. For the purpose of this research only the EGARCH model was used in order to establish a volatility spill over index.

Table 2 shows the findings from the EGARCH (1,1) model for pan Asian countries' listed property companies during the period from year 2000 to 2015. The findings revealed that countries such as Vietnam, the Philippines, Singapore, Thailand, Malaysia, Hong Kong, Taiwan, China, South Korea and Indonesia showed a negative value of γ, which was negative at the 1% significant level. This

exhibits the leverage effect. The results signify that majority of pan-Asian countries' public real estate market experienced negative return shock, which produced lower volatility with a return positive shock. In addition, the findings revealed that the β was close to 1, except Vietnam and Taiwan. These two countries showed a high persistence with slow decay of volatility shock for public real estate markets in these countries over this period. In addition, the γ coefficient was negative in the EGARCH model, which null hypothesis was rejected at the 5% level. Hence, it showed effect of the sum leverage. None of the countries have shown insignificant p-value, thus indicating all pan-Asian countries' listed property companies of the leverage effect are recognised. The output from the findings also revealed the value of β was close to 1, for instance countries such as Vietnam, the Philippines, Singapore, Taiwan, China, South Korea and Indonesia, which indicates high persistence with slow decay of volatility shocks over this period. The results showed that the majority of pan-Asian countries had high volatility over the period of study. The reason behind the high volatility was due to the several financial crises over the period of study, such as the Eurozone debt crisis, GFC, and oil price crisis. Within pan-Asian countries, Vietnam showed highest volatility, followed by the Philippines and China.

These results are similar with Razali's (2015) and Nguyen's (2011), which are majority of pan-Asian countries showing a high number of volatility dynamic factors in the property markets. Their findings also revealed the existence of volatility shocks in certain Asian property markets such as Singapore, Japan and Malaysia over the study period of 1987 to 2003.

The findings of this study have an implication to the pan-Asian listed property companies from the level of volatility perspective. The three countries, Vietnam, China and the Philippines are among the top five countries which have a high Sharpe ratio index. The findings confirm the theory that high risk levels will provide high returns. For instance, the Philippines' property security market placed at number one in terms of Sharpe ratio index. At the same time, the Philippines' property security market demonstrated high volatility. Similar results were also found for Vietnam and Thailand. Earlier studies by Liow (1997, 2008), Newell and Kwong (1996), and Razali (2015) reported similar results which revealed property companies in the Asian market were riskier and volatile. Nevertheless, all those findings used different methods (GARCH model). Table 2 exhibits the overall results of analysis of the dynamic of volatility for pan-Asian countries over the period of January 2000 to December 2015 by using the EGARCH model.

Table 2: Overall Dynamic of Volatility for Pan-Asian Countries over the Period of January 2000 to December 2015

Index	**Japan**	**Vietnam**	**The Philippines**	**Singapore**	**Thailand**	**Malaysia**
Mean Equation						
C	-0.31 (0.08)	0.26 (0.00)	-0.01 (0.81)	-0.43 (-0.43)	-0.24 (0.09)	0.033 (NA)
Variance equation						
ω	-2.48 (0.08)	-1.11 (0.00)	-0.10 (0.24)	-0.29 (0.00)	-10.71 (0.00)	-14.54 (NA)
α	0.32 (0.04)	3.77 (0.00)	-0.12 (0.21)	-0.20 (0.00)	0.48 (0.00)	0.21 (NA)
β	0.66 (0.00)	0.97 (0.00)	0.96 (0.00)	0.93 (0.00)	-0.59 (0.00)	-0.96 (NA)
γi	0.19 (0.03)	-3.05 (0.00)	-0.22 (0.00)	-0.22 (0.00)	-0.25 (0.00)	-0.09 (NA)
SIC	-3.39	-4.08	-3.73	-4.04	-3.23	-4.19
AIC	-3.65	-4.34	-3.99	-4.29	-3.48	-4.45
Log likelihood	363.77	429.67	396.47	425.23	348.26	440.43

Index	**Hong Kong**	**Taiwan**	**China**	**South Korea**	**Indonesia**
Mean Equation					
C	-0.17 (0.09)	-0.08 (0.01)	0.19 (0.46)	-0.007 (0.93	0.13 (0.01)
Variance equation					
ω	-7.74 (0.00)	-0.20 (0.00)	-0.53 (0.16)	-0.31 (0.00)	-0.25 (0.00)
α	-0.08 (0.74)	0.18 (0.00)	0.21 (0.07)	-0.25 (0.00)	-0.23 (0.01)
β	0.51 (0.00)	0.94 (0.00)	0.94 (0.000)	0.90 (0.00)	0.92 (0.00)
γi	-0.19 (0.09)	-1.03 (0.00)	-0.002 (0.97)	-0.26 (0.00)	-0.39 (0.00)
SIC	-3.51	-3.45	-3.13	-2.37	-2.68
AIC	-3.76	-3.70	-3.39	-2.63	-2.93
Log likelihood	374.21	368.99	338.89	266.38	295.51

CONCLUSION

The results of the analysis on the pan-Asian countries has showed the presence of the EGARCH effect in all listed property companies as well as the presence of the unit root in all listed property companies for pan-Asian countries over the studied period of time. EGARCH was able to model the volatility of several countries such as Vietnam, the Philippines, Singapore, Thailand, Malaysia, Hong Kong, Taiwan, China, South Korea and Indonesia. The results showed that these countries have high persistence and slow decay from volatility shocks. In overall, most of the pan-Asian countries have shown high volatility, which is believed to be the effect from several financial crises over this period. The results indicated that Vietnam has high volatility, followed by the Philippines and China, supporting the economic theory on risks and returns.

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MUSHARAKAH MUTANAQISAH (MM) HOME FINANCING FOR AFFORDABILITY OF HOMEOWNERSHIP: A SIMULATION CASE STUDY APPROACH

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Abstract

Since 1990s, the increase in housing price, housing loan application rejection and bankruptcy due to housing loan default, have highlighted the need for a better way of home financing. Islamic home financing that promotes social well-being is a suitable alternative. Malaysia is in the forefront of Islamic financing system development, and Islamic home financing including the *Musharakah Mutanaqisah* (MM) is being implemented. Nevertheless, the MM is implemented with *Wa'd*. This jeopardizes the true spirit of partnership in MM home financing. Why MM is implemented with *Wa'd*? Is MM without *Wa'd* not feasible? The main objective of the present study is to simulate the case of MM without *Wa'd* and evaluate its feasibility. Results revealed that it is feasible to implement MM without *Wa'd*. In addition, MM without *Wa'd* could reduce the probability of loan default and increases the affordability of homeownership

Keyword: *Musharakah Mutanaqisah*, affordable homeownership, simulation approach, housing loan default

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INTRODUCTION

Homeownership is one of the top financial priorities among Malaysians. In Malaysia, "having a roof over your head" is one of the core family values. Owning a house makes one feel protected, secure, happy, a sense of belonging, and being proud of able to provide his or her family members a place where they can live together. To some extent, homeownership could be an added advantage for a man who wish to get married. Home is a source of happiness. A typical "Malaysian dream" is to own a house of his or her ability. Indeed, homeownership is described as "an aspiration of everyone" (Meera, Abdul Razak, & Haron, 2006).

However, since the 1990s, the surging of house price, persistent high housing loan application rejection rate, and substantial number of bankruptcy due to housing loan default, have impeded the achievement of this "Malaysian dream" in homeownership. For instance, housing loan is reported to be one of the top three causes of bankruptcy (Hilwa, Shaliza, & Norasyikin, 2013). On average, around half of the total housing loans applied have been rejected over the period of 2010 to 2016, and the highest rejection rate of 59% was recorded in 2016 ("Scenario of Malaysian", 2016). These highlight the issues of accessibility to and affordability of housing loan. The need for a better way of home financing is clearly called in the Malaysian society.

Homeownership is a long-term financial commitment and the mortgage instalment takes away a substantial portion of one's income. Housing loan consists of the largest portion (41%) in the total household loans applied ("Scenario of Malaysian", 2016). Malaysian banks offer conventional and Islamic home financing to their customers. Undeniably, Malaysia is in the forefront of Islamic financing system development and Islamic home financing, including the *Musharakah Mutanaqisah* (MM) implementation. Kuwait Finance House was the first to offer MM in Malaysia in 2006. Currently, there are more than 16 Islamic banks, including three foreign Islamic banks, offering Islamic loans in Malaysia (Shahwan, Mohammad, & Abdul Rahman, 2013).

In general, there are two types of Islamic housing loan offered in Malaysia - *Bay' Bithaman Ajil* (BBA) and *Musharakah Mutanaquisah* (MM). BBA is a debt-based housing loan that consists of a sale and purchase contract. Practically, as pointed out by Shahwan, Mohammad and Abdul Rahman (2013), BBA is "a deferred payment sale contract of an asset with pre-agreed price, payment method and profit". Customer who wishes to buy a house could get financing from bank where the customer is able to defer the payment of the house price through instalments over a specified period. The actual price that the customer must pay is the price of the house plus bank's mark-up profit (Nooraslinda et al., 2012).

On the other hand, MM is an equity-based housing loan. MM housing loan consists of three contracts which are partnership (*musharakah*), leasing

(*ijarah*) and sale (*bay'*). Firstly, the customer and bank enter into a partnership to own the house that the customer wishes to buy. Both parties share the equity of this house according to the proportion of fund contributed. Secondly, the bank will lease this house to the customer. The customer will pay the bank's portion of the rental income. The customer's portion on the rental income could be kept for early redemption. Third, throughout the lease period, the customer will redeem bank's share of equity on this house. The partnership of the bank is diminishing over the lease tenure and once the bank portion is fully redeemed, the title of the house will be transferred to customer and the partnership will be ended (Asian Institute of Finance, 2013).

Numerous studies have been conducted to compare the features of BBA and MM housing loans. The MM has been found to be a better Islamic housing loan scheme than the BBA. For example, see Meera, Abdul Razak and Haron (2006), Nooraslinda et al. (2012), and Shahwan, Mohammad and Abdul Rahman (2013). Norma and Dzuljastri (2013), and Imtiyaz, Kassim and Harun (2017) concluded that MM is an innovative way of financing, which promotes social justice and well-being. They suggested that MM should be the preferable Islamic financing instrument.

Nevertheless, the MM housing loan has been observed to be unjust to borrower, in terms of its implementation in Malaysia. The Islamic Banking and Takaful Department of Malaysian Central Bank has issued a guideline on the *shariah* compliance requirements of *musyarakah*. One of the compliance requirements is regarding the occurrence of loss:

> "Any loss incurred by the *musyarakah* shall be borne by the partners proportionate to their capital contribution to the *musyarakah*…the partners may agree that the liability of the partnership is limited to the value of capital contributed. Any loss incurred by the *musyarakah* due to misconduct (*ta'addi*), negligence (*taqsir*) or breach of specified terms (*mukhalafah al-shurut*) by a partner shall be borne by that partner."
> (Musyarakah, 2015, pp. 12-13)

The bank and customer should share the profit and loss proportionately to the capital contribution under the MM housing loan. However, in practice, it is found that the bank has pushed the share of loss to the customers. Lee (2013) examines the implementation of MM housing loan offered by an Islamic bank in Malaysia. It was found that in case of customer's default and the property was auctioned, the customer is required to pay the rental in arrears, remaining balance of the bank's share in the equity, and other related costs (liquidation and transfer), regardless the property's auction prices. The bank does not share the loss and leave its unfortunate customer to bear it. Similarly, in the case of property damage

or default by developer (abandon project), the current practice of bank is to ask the customer to bear the loss (Zulkarnain, Shamsher, & Asadov, 2015). Thus, MM is being implemented in Malaysia with *Wa'd*. This contradicts the MM principles. The true spirit of partnership in MM is jeopardized.

Islamic home financing is based on the divine knowledge. The practice of Islamic home financing should be able to ensure the maximisation of social well-being and justice. It is important to note that Malaysian banking sector has been practicing the conventional housing loan for a long time. The conventional loan has been perceived as high-yield and minimal risk. This might have caused the banks, in offering Islamic housing loan, they tend to make it resembles the conventional loan. As profit-oriented organisations, the Islamic Financial Institutions (IFI) prefer to provide the housing loan that resembles to conventional financing package (Zulkarnain, Shamsher, & Asadov, 2015). Thus, MM with *Wa'd* is being implemented in Malaysia for the perceived higher yield.

The questions that follows are: is it really not feasible for the IFI to implement MM without *Wa'd*? Does MM with *Wa'd* is more profitable than without *Wa'd* as what have been perceived? Is it possible to have MM without *Wa'd* for better home affordability? In Malaysia, it seems that MM with *Wa'd* that resembles more to the conventional housing loan is perceived as more rewarding. This perception might not be true. The LARIBA, a local Islamic bank in the United States, is offering MM housing loan without *Wa'd* to the Muslim and non-Muslim societies. LARIBA housing loan model has been described as successful and serves as an attractive alternative to the conventional housing loan (Yahia & Abdullah, 1999).

In Malaysia, to our knowledge, there is no empirical studies on comparing the returns of MM with *Wa'd* and MM without *Wa'd*. The comparison would enable us to evaluate the feasibility of implementing MM without *Wa'd* in terms of profit from the bank's perspective. To fill the gap, this paper aims to evaluate the returns of MM without *Wa'd* using a case study approach. The impacts of default, growing rental rate and flexible instalment are also incorporated.

DATA AND METHODOLOGY

Case Descriptions

We employed a real case of a housing loan for a single storey low-cost terrace house located in Taman Puchong Perdana, Petaling, Selangor, as below:

House price: RM350,000; Deposit (20%): RM70,000
Loan amount (80%): RM280,000; Loan tenure (year): 30

Based on the above information, the rental income (based on historical Average Gross Yield), the monthly instalment/redemption of the Islamic housing loan from three IFIs in Malaysia (as provided by the IFIs), and MM without *Wa'd* (calculated using the formula of Meera, Abdul Razak and Haron, 2006) are as in Table 1 below:

Table 1: Rental, share of equity, redemption, instalment and IRR

	Rental [1] (RM)	Share of (RM):[2]		Monthly Redemption[3]	Monthly Instalment[5]	IRR (%)
		Customer	Bank			
MM without *Wa'd* (20:80)	1092	218	874	615	1489	-
Other Islamic bank loans:						
a. BIMB@4.2%	-	-	-	-	1369	4.2
b. CIMB@4.9%	-	-	-	-	1486	4.9
c. MBB@4.3%	-	-	-	-	1386	4.3

Note:
1. Rental per month, based on historical data – average gross yield
2. Based on the proportion of fund contributed. Deposit (20%) and loan (80%), i.e, 20:80.
3. Monthly redemption, calculated based on the formula of Meera, Abdul Razak and Haron (2006).
4. As provided by the bank or it could be calculated using financial calculator.

Statistically, the average growth rate of house price in Selangor, from year 2000 to 2010, was 3.7%. We also examined two valuation reports of year 2017, and it was found that the difference between market value and forced sale value of a property was 20%. The average gross yield of rental for residential property in Petaling, Selangor was found to be 2.4%. The probability of default was based on the default rate of housing loan accounts of an established bank in Malaysia, over the loan tenure as in Table 2 below.

Simulation Steps

Step 1: Based on the parameters of the selected case, we calculated the cash flow of MM with *Wa'd*. Then, the bank's IRR (internal rate of return) was calculated. The IRR is a rate that able to discount the entire cash flow to have a zero net present value. Thus, IRR represents the return to the bank such that the higher is more desirable. The IRR of MM with *Wa'd* that could serve as a bench-marking point for MM without Wa'd.

Step 2: The MM without *Wa'd*, i.e., the case of default was incorporated into the calculation of IRR. The expected value of cash flow where the bank will share the losses and profits with its customer (MM wihout *Wa'd*). Based on this

expected cash flow, the bank's IRR was calculated. This was also the IRR of MM without *Wa'd*.

Step 3: Compare the two IRRs. If the IRR of MM with *Wa'd* was higher than MM without *Wa'd*, the MM without *Wa'd* is not feasible for bank. As a private organisation, bank has to be profit-oriented and responsible for its depositors and stakeholders who provide the funds. The IRR of MM without *Wa'd* could be compared to the IRR of other available Islamic housing loans, i.e., BIMB (4.2%), CIMB (4.9%) and MBB (4.3%).

Table 2: Probability of default over the loan tenure

Loan tenure (year)	Probability of:		Loan tenure (year)	Probability of:	
	Default	No default		Default	No default
1	0.0050	0.9950	16	0.0078	0.9922
2	0.0201	0.9799	17	0.0072	0.9928
3	0.0166	0.9834	18	0.0067	0.9933
4	0.0265	0.9735	19	0.0061	0.9939
5	0.0371	0.9629	20	0.0056	0.9944
6	0.0585	0.9415	21	0.0050	0.9950
7	0.1177	0.8823	22	0.0045	0.9956
8	0.1381	0.8619	23	0.0039	0.9961
9	0.1467	0.8533	24	0.0033	0.9967
10	0.1411	0.8589	25	0.0028	0.9972
11	0.1182	0.8818	26	0.0022	0.9978
12	0.0964	0.9036	27	0.0017	0.9983
13	0.0690	0.9310	28	0.0011	0.9989
14	0.0089	0.9911	29	0.0006	0.9994
15	0.0083	0.9917	30	0.0000	1.0000

Note: The default rate from year 1st to 14th year is based on the actual default rate. The default rate is not available from 15th year and onwards, it is calculated using linear extrapolation where the default rate of 30th year is set to zero.

RESULTS AND ANALYSIS

The IRR of MM with *Wa'd*

First, we calculated the IRR with *Wa'd* where in the case of default, all losses or gains are borne by the customer like a conventional housing loan. Thus, the bank is sort of guaranteed for the cash flow resembles case of no default. This MM

with *Wa'd* housing loan was: house price RM350,000, monthly instalment RM1,489, monthly redemption RM615, monthly rental income RM1,092, deposit RM70,000, loan amount RM280,000, and loan tenure 30 years (as described before). Table 3 presents the calculations.

Table 3: Cash flow of bank for MM with *Wa'd*

Yr[1]	Yearly			Share of equity:[5] RM		%		Extra redemption[6]		Cash flow of bank
	Instal.[2]	Red.[3]	Rent.[4]	Cust.[1]	Bank	Cust.[1]	Bank	Yr	Acc.[1]	
0	-	-	-	70000	280000	0.20	0.80	-	-	-280000
1	17868	7380	13104	77380	272620	0.22	0.78	0	0	17868
2	17868	7380	13104	84760	265240	0.24	0.76	276	276	17868
3	17868	7380	13104	92140	257860	0.26	0.74	553	829	17868
4	17868	7380	13104	99520	250480	0.28	0.72	829	1658	17868
5	17868	7380	13104	106900	243100	0.31	0.69	1105	2763	17868
6	17868	7380	13104	114280	235720	0.33	0.67	1382	4145	17868
7	17868	7380	13104	121660	228340	0.35	0.65	1658	5802	17868
8	17868	7380	13104	129040	220960	0.37	0.63	1934	7737	17868
9	17868	7380	13104	136420	213580	0.39	0.61	2210	9947	17868
10	17868	7380	13104	143800	206200	0.41	0.59	2487	12434	17868
11	17868	7380	13104	151180	198820	0.43	0.57	2763	15197	17868
12	17868	7380	13104	158560	191440	0.45	0.55	3039	18236	17868
13	17868	7380	13104	165940	184060	0.47	0.53	3316	21552	17868
14	17868	7380	13104	173320	176680	0.50	0.50	3592	25144	17868
15	17868	7380	13104	180700	169300	0.52	0.48	3868	29012	17868
16	17868	7380	13104	188080	161920	0.54	0.46	4145	33157	17868
17	17868	7380	13104	195460	154540	0.56	0.44	4421	37578	17868
18	17868	7380	13104	202840	147160	0.58	0.42	4697	42275	17868
19	17868	7380	13104	210220	139780	0.60	0.40	4974	47249	17868
20	17868	7380	13104	217600	132400	0.62	0.38	5250	52498	17868
21	17868	7380	13104	224980	125020	0.64	0.36	5526	58025	17868
22	17868	7380	13104	232360	117640	0.66	0.34	5802	63827	17868
23	17868	7380	13104	239740	110260	0.68	0.32	6079	69906	17868
24	17868	7380	13104	247120	102880	0.71	0.29	6355	76261	17868
25	17868	7380	13104	254500	95500	0.73	0.27	6631	82892	17868
26	17868	7380	13104	261880	88120	0.75	0.25	6908	89800	17868
27	17868	7380	13104	269260	80740	0.77	0.23			
28	17868	7380	13104	276640	73360	0.79	0.21			
29	17868	7380	13104	284020	65980	0.81	0.19			
30	17868	7380	13104	291400	58600	0.83	0.17			

Notes:

1. Yr = year of loan tenure; Cust. = customer; Acc. = accumulated.
2. Yearly installment = 12 x monthly instalment (RM1489)
3. Yearly Redemption = 12 x monthly redemption (RM615)
4. Yearly rental income = 12 x monthly rental (RM1092)
5. Share of equity: proportion of funds contributed to capital. For example, at the beginning (Year 0), customer contributes RM70000 (deposit) and bank contributes RM280000 to purchase the house (RM350000).
6. To illustrate the opportunity to have flexible installment schedule if this extra redemption could be used to be part of installment.

From Table 3, it is shown that the equity of the bank is diminishing over the loan tenure. The rental income is assumed to be constant over the loan tenure. There is extra redemption due to the fact that since the equity of customer is increasing over time, the fixed redemption amount (RM7,380 per year) that is based on the constant 20% equity, is more than it should be. This extra redemption enables the loan to be settled early. In the present case, the loan could be ended in the 25th year, instead of the 30th year. This is one of the attractive features of MM without *Wa'd* housing loan (Yahia & Abdullah, 1999).

Moreover, this extra redemption could be used to settle partially the monthly instalments. Thus, the actual instalment paid by customer could vary over the loan tenure. For instance, in the 2nd year, the instalment could be lowered by RM276. Hence, upon mutual agreement between bank and customer, there is opportunity to have flexible instalments that enhances the housing affordability of customer.

The IRR is found to be 4.2%. This is the IRR for MM with *Wa'd* that is practiced by the Malaysian IFI currently. Compared to the other Islamic loans, the IRR of BIMB, MBB and CIMB are 4.2%, 4.3% and 4.9% respectively. Thus, the IRR of MM with *Wa'd* is similar to BIMB, but lower than CIMB and MBB.

The IRR of MM without *Wa'd*

We incorporated the case of default. It is also assumed that the MM without *Wa'd* is implemented, i.e. the bank will share the loss or profit proportionately to the share of equity. We still used the parameters of Table 3 except the default is now incorporated. It is important to note that a loan default is not necessary lead to auction of house. As a standard practice, the bank will take the pre-auction steps such as negotiation to re-schedule the loan. In this paper, for simplicity of calculation, we assume the worst case of loan default, which is the bank will auction the house. The forced sale occurs with the 20% discount from the market values. Table 4 presents the calculations.

Table 4: Cash flow of bank for MM without *Wa'd*

Yr[1]	House price:		Profit/loss if default[3]		Probability of:[4]		MM without *Wa'd*		
	Market[2]	Forced sale (20%)	Cust.[1]	Bank	Default	No default	Bank's cash flow:[5] Default	Bank's cash flow:[5] No default	Expected bank's cash flow[6]
0	350000				0.0000	1.0000	-280000	-280000	-280000
1	362950	290360	-19308	-40332	0.0050	0.9950	-40332	17868	17577
2	376379	301103	-18190	-30706	0.0201	0.9799	-30706	17868	16892
3	390305	312244	-16523	-21232	0.0166	0.9834	-21232	17868	17219
4	404746	323797	-14278	-11925	0.0265	0.9735	-11925	17868	17078
5	419722	335778	-11424	-2798	0.0371	0.9629	-2798	17868	17101
6	435252	348201	-7929	6131	0.0585	0.9415	6131	17868	17181
7	451356	361085	-3761	14846	0.1177	0.8823	14846	17868	17512
8	468056	374445	1117	23328	0.1381	0.8619	23328	17868	18622
9	485374	388300	6740	31559	0.1467	0.8533	31559	17868	19876
10	503333	402667	13148	39519	0.1411	0.8589	39519	17868	20923
11	521957	417565	20380	47186	0.1182	0.8818	47186	17868	21333
12	541269	433015	28478	54537	0.0964	0.9036	54537	17868	21403
13	561296	449037	37486	61550	0.0690	0.9310	61550	17868	20882
14	582064	465651	47452	68199	0.0089	0.9911	68199	17868	18316
15	603600	482880	58422	74458	0.0083	0.9917	74458	17868	18340
16	625933	500747	70448	80298	0.0078	0.9922	80298	17868	18354
17	649093	519274	83583	85691	0.0072	0.9928	85691	17868	18358
18	673109	538488	97882	90605	0.0067	0.9933	90605	17868	18354
19	698014	558412	113403	95008	0.0061	0.9939	95008	17868	18340
20	723841	579073	130208	98865	0.0056	0.9944	98865	17868	18319
21	750623	600498	148358	102140	0.0050	0.9950	102140	17868	18290
22	778396	622717	167922	104794	0.0045	0.9956	104794	17868	18255
23	807197	645757	188969	106788	0.0039	0.9961	106788	17868	18214
24	837063	669650	211571	108079	0.0033	0.9967	108079	17868	18169
25	868034	694428	235806	108622	0.0028	0.9972	108622	17868	18120
26	900152	720121	261751	108370	0.0022	0.9978	108370	17868	18069
27	933457	746766	289492	107274	0.0017	0.9983			
28	967995	774396	319114	105282	0.0011	0.9989			
29	1003811	803049	350710	102339	0.0006	0.9994			
30	1040952	832762	384374	98387	0.0000	1.0000			

Notes:

1. Yr = year of loan tenure; Cust.=customer
2. Market price of house is assumed to grow at a rate of 3.7% (historical average growth rate,as described before)
3. Profit/(loss) = payment received from auction – contribution to capital = [(share of equity in %)x(auction price of house)] – [share of equity in RM]

4. The default rate from year 1st to 14th year is based on the actual default rate. The default rate is not available from 15th year and onwards, it is calculated using linear extrapolation where the default rate of 30th year is set to zero.
5. Cash flow (default) = payment received from auction – contribution to capital = [(share of equity in %)x(auction price of house)] – [share of equity in RM]; Cash flow (no default) = 12 x monthly instalment (RM1489). For Year 0, the cash flow is loan distributed (RM280000), negative.
6. Expected cash flow = [Cash flow (default) x Prob. of default] + [Cash flow (no default) x Prob. of no default]

Based on the expected cash flow, the IRR of the MM without *Wa'd* is found to be 4.5%. This is 0.03% higher than the case of MM with *Wa'd* (4.2%). This indicates that the implementation of MM without *Wa'd* is feasible, in terms of returns. Moreover, this IRR is also higher than the Islamic loan product of BIMB and MBB. Thus, the MM without *Wa'd* is feasible in this case. Bank is expected to derive higher return if the MM housing loan was implemented without *Wa'd*.

DISCUSSIONS AND CONCLUSION

Using a simulation case study approach, this paper aims to evaluate the feasibility of MM without *Wa'd* by comparing its internal rate of return (IRR) to those of MM with *Wa'd*. MM housing loan in Malaysia has been implemented with *Wa'd*, which deteriorates the true spirit of partnership in MM. Results revealed that the IRR for MM without *Wa'd* is higher than the IRR of MM with *Wa'd*. This result is intuitive. House is a real property and historically, house price in Malaysia is increasing over time. Investment in a real property should be profitable. Thus, it is not a surprise at all that when a bank joins in the partnership to share losses and profits, the bank will enjoy higher returns than not joining the partnership. This result also refutes the perception of the bank that MM with *Wa'd* is providing higher returns. The Malaysian IFI preference of MM with *Wa'd* seems due to their mis-perception.

The practice of conventional housing loan has been long rooted in the banking sector. It is the responsiblity of Malaysian Central Bank and the related authorities to guide and push the IFI to shift from conventional housing loan to a truly Islamic housing loan. This will increase the social well-being and social justice, especially for the lower income group to have better alternative of housing loan scheme. Moreover, MM housing loan appears to be able to provide a flexible instalment over the loan tenure. The extra redemption that a customer gains throughout the diminishing partnership enables this flexibility. Thus, the feasibility and benefits of MM without *Wa'd* housing loan is clearly illustrated. The LARIBA model of MM without *Wa'd* housing loan scheme could be replicated in Malaysia.

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STRATEGIC FACILITIES MANAGEMENT FUNCTIONS FOR PUBLIC PRIVATE PARTNERSHIP (PPP) HEALTHCARE SERVICES IN MALAYSIA

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Abstract

There is an increase trend seen in the implementation of public private partnership (PPP) to deliver public infrastructures in Malaysia. In healthcare sectors, particularly hospital, PPP has been adopted by the government as one of the sourcing strategies in providing facilities management (FM) services. In this arrangement, facilities management plays an important role in ensuring the success of partnership. Yet, investigations on strategic facilities management functions are inadequate. Thus, this paper aims at identifying the strategic facilities management functions for PPP healthcare within Malaysian context. Interview sessions were conducted with industries practitioners involved in the implementation of PPP facilities management in Malaysia. Data collected were analysed through content analysis. Responses from the respondents indicated three main categories of strategic FM functions, which are Formulate Strategies, Determine Service Requirement and Communication. The findings provided clear strategic FM functions that are crucial in aligning the FM division with PPP stakeholder's vision.

Keyword: facilities management, strategic functions, public private partnership, healthcare services

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INTRODUCTION

There is an increasing demand for improved public infrastructure and services worldwide. Expectation of the community towards the government in providing them the best services has kept on rising. Hence, most governments have started adopting new strategy in delivering their services through partnership with private sector to design, finance, build and manage their projects, which is also known as public private partnership (PPP) scheme. With the involvement of the private sector, PPP scheme is believed to help the government in delivering better infrastructures and services.

Most countries have begun to use the PPP for economic infrastructures and gradually move into social infrastructures such as schools and healthcare (Espigares & Torres, 2009). In line with the development in PPP implementation, the involvement of private sector is encouraged not only in financing and building the infrastructures, but also in the operational phase specifically to deliver services that support the running of organisational business (Takim, Abdul-Rahman, Ismail, & Egbu, 2008). This development has highlighted the needs for facilities management (FM) at design (Edum-Fotwe, Egbu, & Gibb, 2003; El-Haram & Agapiou, 2002; Ling, Shaharom, Marzukhi, & Marzuki, 2018) and operational phases of PPP projects (Oyedele, 2013; Robinson & Scott, 2009; Wang, 2010).

PPP arrangement has demanded an efficient FM function; yet, little attention was given to this subject. Hinks (2002) and Chotipanich (2004) emphasised that the function, management role, scope and priority of FM functions should be designed to fit with an organisation or business. Thus, the establishment of FM functions in delivering PPP is important as different delivery strategy requires different approach. On top of that, Wiggins (2010) stated that lack of understanding in the overall scope and range of responsibilities is often occurred in FM field. Therefore, the establishment of FM profile for a specific project would result in an appropriate FM practice and arrangement (Chotipanich, 2004). Subsequently, this study seeks to propose a structured FM division for PPP scheme through the establishment of clear strategic FM functions.

LITERATURE BACKGROUND

The recognition of FM functions within an organisation is essential in delivering both strategic management and operational services of FM. From the management perspective, FM is considered as a continuous process that operates within three management levels namely strategic, tactical and operational. Meanwhile, functional perspective of FM emphasised the action done or local procedure within the organisation, which is responsible for FM services (Sarshar, 2006). Thus, the delivery of FM services requires various strategic management functions from the division.

Strategic Management Functions of FM

Strategic level is the top level of management in every organisation. All the planning, decision and strategies developed at this level are for a long-term span. This level consists of decision makers whose mission is to achieve organisation's objectives in long term period (Talamo & Bonanomi, 2015). In FM context, strategic management functions are related to the establishment of overall long term strategies and translation of legal and stakeholder requirements as well as expectations into service outcomes (CIDB, 2011). The following table shows the general strategic FM functions discussed by previous scholars and FM organisations.

Table 1: General strategic FM functions

	FM functions	**Scope of functions**	**Sources**
1.	Define overall FM strategy	Development of FM strategies from organizations' mission and vision statement.	Jones, 1996; Wiggins, 2010
2.	Establish policy and guideline	Establishment of policy and coordination guideline to describe responsibility, process and procedure for facilities planning, design, and construction, and reporting of services delivery activities.	Cotts, Roper, & Payant, 2009
3.	Initiate risk analysis	Establish clear objectives and statement in regard to the risk management and	CIDB, 2011

		communicate with the organization in regards to the risk that the organization is willing to accept.	
4.	Establish effective purchasing and contract strategies	Identify the advantages and disadvantages of different contract types available can be used in purchasing FM services and product	Wiggins, 2010; Atkin & Brooks, 2009
5.	Formulate building and service appraisal	Present the new planning processes or procedures from based on the appraisal conducted when the organisation is either shrinking or expanding or in	Barrett & Baldry, 2009
6.	Identify and select maintenance strategies	Develop maintenance policy and select the best maintenance strategy from a set of possible alternatives such as corrective, preventive, opportunistic, condition-based and predictive maintenance.	Shyjith, Ilangkumaran, & Kumanan, 2008; Chanter & Swallow, 2007
7.	Manage facilities impact	Quantify the impact of facilities	Wiggins, 2010; Barrett & Baldry,

		towards the organisation's business as well as environmental and community.	2009; Alexander & Brown, 2006; Cotts et al., 2009
8.	Conduct strategic alignment, analysis, and briefing	Align the overall FM strategy and process with client situation. Conduct strategic analysis in order to understand client property portfolio, its real estate strategy and associate services.	Wiggins, 2010; Nutt, 1993; Martin, 2004
9.	Create service partnership	Establish clear benefits, objectives and milestone with the selected partners.	Atkin & Brooks, 2009; Lehtonen & Salonen, 2006; Ventovuori, Lehtonen, & Miettinen, 2004
10.	Negotiate service level agreement and standard	Develop and negotiate a clear service level agreement (SLA) and standard before service delivery is started.	Grigg, 1996; Wiggins, 2010
11.	Initiate and monitor key performance indicators (KPIs)	Initiate focus and goals of KPIs. Aligning FM KPIs with organization's measurement philosophy and requirements.	Booty, 2009; Wiggins, 2010

12.	Identify business needs and user‟s requirement	Identification of client (the party that agrees the service and foots the bill) and who is the customer (the end user); and balance the satisfaction of both parties.	Grigg, 1996; Noor & Pitt, 2009
13.	Creation of an active input and response at corporate level	Provide information and updates on the contribution of FM to the achievement of corporate objectives by saving costs, or adding value, and increasing both	Chotipanich, 2004; Then, 1999; Cotts et al., 2009
14.	Maintenance of relations with strategic partners	Develop partnership relationship between clients/end-uses and suppliers/service providers.	Wiggins, 2010; Barrett, 2000

It was discovered that detailed disclosure of strategic functions of FM is very little. Basic management functions of strategic FM were identified through various resources such as FM books, FM manual and several FM profession articles. The initial idea of this study is to identify specific FM functions for PPP healthcare services. Moreover, studies that put forward this subject area are very limited especially within the Malaysian context. Hence, this paper attempts to fill this gap through experts' interview. The next section discusses how the study was conducted.

RESEARCH METHOD

This study adopted qualitative method. Interview was considered as the most appropriate method to be adopted as it enables researchers to communicate with the main sources (PPP stakeholders and PPP facilities management stakeholders)

that provide information on PPP facilities management. A purposeful discussion enables researchers to gather valid and reliable data to answer research questions and objectives (Saunders, Lewis, & Thornhill, 2009). Purposive sampling, which is one of the most common sampling techniques used in qualitative research (besides quota sampling and snowball sampling (Mack, Woodsong, MacQueen, Guest, & Namey 2005)), was adopted in selecting the respondents for the interview. It is known as a non-random technique involving the selection of individuals or groups of individual that are proficient and well-informed on a phenomenon of interest (Creswell & Clark, 2011).

Based on knowledge and experiences, PPP facilities management practitioners were observed able to give good input for this study. The selection process began with identifying PPP facilities management stakeholders in Malaysia. Saturation (Suri, 2011) and time frame (Mack et al., 2005) were used as the guiding principles for sample size. Moreover, it has been emphasised by Mack et al. (2005) that purposive sample sizes are determined on the basis of theoretical saturation and mostly successful when the data review and analysis are done in line with data collection. Throughout the data collection (interview) phase, it was found that eight respondents were sufficient to obtain the desired information, and the interview was stopped when there was no new data discovered. Nevertheless, time frame allocated for this study has limited the amount of interviews that can be conducted.

Content analysis was used to analyse the interview data using Qualitative data analysis software (QDAS) – Nvivo 11. This analysis involved coding process by organising the data into conceptual categories (sub-functions). The themes of concept (FM functions) were then created to categorise the obtained sub-functions.

FINDINGS AND DISCUSSION

A total of eight interviews with the PPP facilities management practitioners were conducted. Alphabets including 'Respondent A' were used in this section to protect the identity of the respondents. Responses from the respondents suggested three categories of FM function at strategic level, which were Formulate Strategy, Determine Service Requirement and Communication. Identified sub-functions under each category of FM functions were either confirmed, not cited or added from the ones discovered from the literature. 'Confirmed' indicated that the sub-functions and its management level identified from the interview have been discovered earlier in the literature. Meanwhile, 'Not cited' indicated that these sub-functions have been discovered in literature, but were not mentioned by any respondents. Furthermore, 'Added' indicated the discovery of new sub-functions and its management level through the interview. The following Table 2 displays the findings from the analysis conducted.

Table 2: Strategic FM functions and sub-functions for PPP healthcare services

No.	FM Functions & Sub-Functions	Status
	Develop Strategies	
1.	Define overall FM strategies	Confirmed
2.	Establish policy and guideline	Confirmed
3.	Initiate risk analysis	Confirmed
4.	Establish effective purchasing and contract strategies	Confirmed
5.	Formulate building and service appraisal	Confirmed
6.	Identify and select maintenance strategies	Confirmed
7.	Manage facilities impact	Not Cited
8.	Conduct strategic alignment, analysis, and briefing	Confirmed
9.	Create service partnership	Not Cited
10.	Develop vision and mission	Added
11.	Develop business unit	Added
12.	Formulate business model	Added
13.	Establish project viability	Added
14.	Develop total integrated healthcare FM	Added
	Determine Service Requirements	
15.	Negotiate service level agreement	Confirmed
16.	Initiate and monitor KPIs	Confirmed
17.	Identify business needs and user‘s requirement	Confirmed
	Communication	
18.	Create active input and response at corporate level	Confirmed
19.	Maintain relations with strategic partners	Confirmed

Develop Strategies

Develop Strategies focuses on the essential aspects in the operation of services and the overall functions of FM. Respondents are mostly highlighted on the development of FM strategies, policy, vision and mission, strategic alignment and the need to consider the lifecycle perspective as well as long term commitment of FM. Typical statements from respondents were captured here as:

> *“At strategic level, FM is responsible in ensuring that the vision of the Ministry of Healthcare (MOH) is met. For example, if a client wants to provide sustainable healthcare facilities, FM needs to develop FM strategies based on that purpose. Then, these strategies need to be translated into the vision and mission of the whole organisation”* Respondent G.

> *“Strategic is important for policy making and developing strategies from a lifecycle perspective. As PPP contract may be up to 25-30 years, all the aspects need to be viewed from a long term perspective and considered the whole life cycle of the projects”* Respondent H.

The abovementioned functions are in line with the decision making process conducted at strategic level, which covers various aspects such as maintenance strategies, contract strategies, business model, risk analysis and project viability. A respondent stated that:

> *"In formulating business model, top level may consider several options such as contract management, contract services and contract procurement. Or in term of sourcing, they have to choose either to outsource, insource or smart sourcing. There are lots of strategies available, but it is strategic function to choose the one that benefits the projects as well as division"* Respondent C.

Analysing the whole project is crucial enough for strategic level. In explaining this function, one respondent has highlighted the establishment of project viability in detailed as depicted below:

> *"For project viability, we have to conduct various analyses including demand and supply of project for now or in future. We also have to look into the needs of project development, social economic benefits, economic multiplier effects and the Government's affordability as well as capital expenditure. After that, we will continue with analysing project financial cash flow, bankability of project financing and terms of loan versus equity structure. This is where we look into the internal rate of return, management cost of the third party contracting and decide on reasonable profit margin"* Respondent F.

Besides, this level needs to strategise business unit for a project. Various expertise, knowledge and skills are needed in delivering the services. In terms of staffing, training aspect was frequently mentioned by the respondents as one of the initiatives to ensure the quality of services. Some statements from respondent for this function are:

> *"For PPP, our company wants to maintain the level of services so we will ensure that the right people are doing the right job. When we hired new staff, we provide a proper training for them. It is not an easy task as we have to properly train and monitor them, but this is a way for us to control the quality of services. Usually, it took four month for staff to learn the right way to do their job. But, if they are still unable to do their job after four month, it means that they are not competent enough so we will do some replacements"* Respondent E.

Moreover, the formation of total integrated healthcare FM has to be conducted at strategic level. Respondents emphasised on five main services to be provided by FM division once the hospital started its operation, which are facilities engineering maintenance services (FEMS), biomedical engineering maintenance services (BEMS), cleansing services (CLS), linen and laundry services (LLS) as well as hospital waste management services (HWMS). A typical statement for these is illustrated as follows:

> "*Strategically, we need to integrate these five services. Coordination of these services will ensure the smooth running of their delivery and operation"* Respondent B.

Determine Service Requirement

The second FM function identified at strategic level is analysing requirements. This function focuses on the services to be provided particularly in terms of service level, performance and service required by the users.

> *"After clearing on vision and mission, FM has to determine the level of services. The aim here is to provide the services that meet client's expectation. The first aspect that we look is response time that shows how fast we can respond to clients. Number two is reliability and availability of equipment that we provide. How many percent of the equipment must be available? How many minutes the breakdown can happen? So, we can say that in strategic, there is level of service. Then in level of service, there are other aspects including performance and cost"* Respondent E.

With regard to the client's need and user requirements on the services:

> *"Unit Kerjasama Awam Swasta (UKAS) will prepare statement of needs based on client's requirement received from the MOH. So FM will outline the services based on this statement of needs"* Respondent A.

> "*Example of our roles here is to propose how many beds, how many operation theatres, types of facilities, how big is pharmaceutical space and the ancillary services needed by clients. All of these aspects are initiated from client's requirement prepared by the UKAS in form of statement of needs"* Respondent E.

Communication

The third FM function identified at strategic level is communication, which reflects the role of FM to create communication link among top managements of FM party, organisation/clients and other key players. Respondents discussed the active communication and relations between FM and other disciplines.

> *"In PPP, various backgrounds are involved in delivering the projects. It is important for FM to get mutual understanding and maintain a good relationship with other strategic partners of the project"* Respondent A.

> *"Some processes including the identification of client needs involve the integration of multiple engineering disciplines and synergy of support services. So, FM should exchange information with other disciplines"* Respondent I.

CONCLUSION

This study has discussed strategic FM functions of PPP healthcare services particularly in the Malaysia context. It has highlighted the identification of FM profile needed for a new arrangement in delivering FM services that includes PPP scheme. Strategic FM functions and sub-functions have been identified through interviews with PPP facilities management practitioners consisting the public and private sectors. The analysis revealed that FM functions at strategic level are very important in aligning the division with PPP stakeholder's vision. These stakeholders of PPP facilities management for healthcare services are the Ministry of Health (MOH), hospital organisations and patients. Therefore, this level will determine the direction of strategic FM and ensure that this direction can be translated into its daily basis. Three categories of FM functions have been identified at strategic level, which are Develop Strategies, Determine Service Requirements and Communication.

These findings should be further tested as the discovery of the FM functions is not complete without the priority of the functions and their relationship with the performance of PPP projects. Therefore, strategic FM functions and sub functions specifically for PPP facilities management obtained in this study can be a good basis for the developing another instrument in the next level of study.

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COMPARISON ON ENERGY SAVING: GREEN ROOF AND GREEN WALL

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Abstract

Green building conveys undeniably numerous benefits to the environment, social and economic aspects. The most substantial benefit of green building is energy conservation. Green roofs and green walls are amongst the green components that are synonymous with green building. These green components are similar in nature as both are based on the concept of vegetation coverage on buildings. Vegetation is a well-known natural medium that performs the photosynthesis process where it releases molecular oxygen and removes carbon dioxide from the atmosphere. Many studies have proved that these two green components are efficient in reducing energy consumption of a building. Therefore, this study aims to examine and compare the annual energy savings conveyed by green roofs and green walls on residential buildings in Malaysia. The findings indicated that green walls provide greater annual energy savings than green roofs. The result shows that green walls are able to provide higher annual electricity savings for residential buildings at RM166 compared to green roofs, which provide savings of only RM139.

Keywords: green roof, green wall, energy saving, residential, Malaysia

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INTRODUCTION

The building sector is greatly responsible for high energy consumption levels (Zimmermann, Althaus, & Haas, 2005; Office of Energy Efficiency and Renewable Energy, 2010; Ismail, Al-Obaidi, & Sulaiman, 2016). It was recorded that the trend of energy consumption for the building sector in Malaysia has risen at approximately 34% from year 2005 to 2010 (Kwong, Adam, & Sahari, 2014), and that yearly electricity consumption caused by air-conditioning was recorded as the highest among household appliances in Malaysia. The Malaysian national census reported that the total number of households with air-conditioning in Malaysia has dramatically increased from 13,000 units to 775,000 units from the year 1970 to year 2000. Therefore, the alarming increment in building energy consumption has triggered a green building movement around the world.

The integration of green roofs and green walls are synonymous with green building development. These green components are similar in nature as both are based on the concept of vegetation coverage on buildings. Vegetation is well-known as the natural medium that performs the photosynthesis process, where it releases molecular oxygen and removes carbon dioxide from the atmosphere. Both green components are able to provide energy savings on buildings. Several researches have shown that the integration of both green components have empirically proven to convey annual energy savings through reduced energy cooling demand of a building (Niachou, Papakonstantinou, Santamouris, Tsangrassoulis, & Mihalakakou, 2001; Santamouris et al., 2007; Wong, Tan, Wong, Tan, & Wong, 2009; Haggag, Hassan, & Elmasry, 2014; Jaafar, Said, & Rasidi, 2013). Hence, the applications of these green components are appropriate for countries that receive large amounts of sunlight including Malaysia. Therefore, this study pursues to analyse and compare the annual energy saving benefits conveyed by these green components. This study is important to provide an empirical proof of monetary savings via the energy saving benefits related to these green components on residential buildings in Malaysia. This study also plays a significant role in assisting and encouraging the integration of green roofs and green walls with residential buildings, as both green components are relatively new in Malaysia.

THE CONCEPT OF GREEN ROOF AND GREEN WALL

Green roofs consist of several layered systems, namely, the waterproofing membrane, the growing medium and the vegetation layer. Usually green roofs also consist of a root barrier layer, a drainage layer and an irrigation system (Sadineni, Madala, & Boehm, 2011). There are two types of green roof setups, which are extensive roof and intensive roof. The difference between these roofs are mainly in the depth of the layer of substrate. Extensive roofs have a thinner layer of substrate which allows low level plants such as sedum or grass to nurture. On the other hand, intensive green roofs have a deeper substrate layer and allow

deep rooting plants such as trees and shrubs to grow. Figure 1 below demonstrates the schematic representation of extensive and intensive green roof configurations.

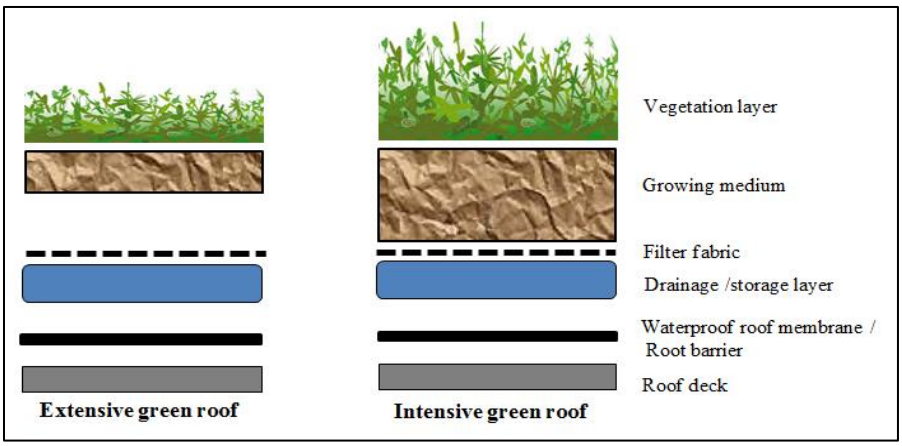

Figure 1: Schematic representation of extensive and intensive green roof configurations

Green wall is a concept which involves greening a vertical surface with a selection of plant species. Green wall systems can be divided into two, namely, green facade and living wall (Yu & Hien, 2009; Manso & Castro-Gomes, 2015). The prominent difference between the green facade and living wall systems is in the location of the growing media. Growing media is the place where nutrient for the plants' root is provided. Growing media that stays on the ground while the plants grow vertically over the vertical surface is called green facade (Binabid, 2010; Kontoleon & Eumorfopoulou, 2010). Growing media that is spread over the vertical wall as a layer, on which the plants grow, is called living wall. Figure 2 below displays the variation types of green wall.

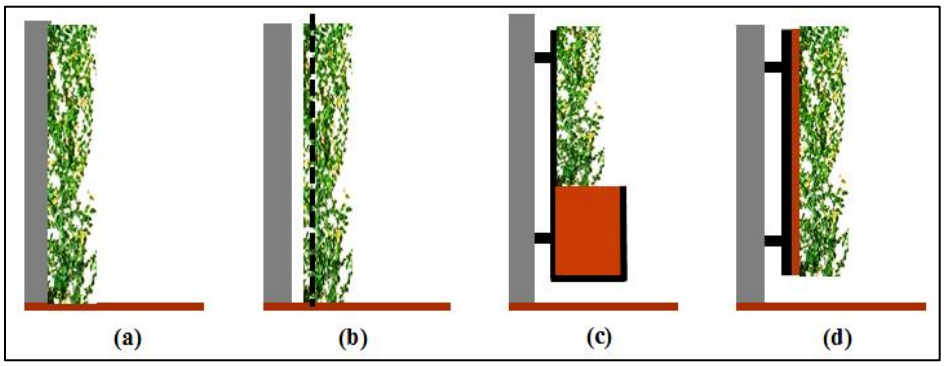

Figure 2: (a) Direct green facade; (b) Indirect green facade; (c) Indirect green facade with planter box; (d) Green living wall

ENERGY SAVINGS OF GREEN ROOF

Chen (2013) established that green roofs are generally built to enhance energy efficiency of buildings by preventing the penetration of solar heat into the building through the rooftop surface. Green roofs were verified to provide a cooling effect by reducing the indoor air temperature (Ismail et al., 2016). An experimental test and simulation was conducted by Santamouris et al. (2007) to investigate the performance of green roofs in reducing cooling and heating demand during summer and winter respectively. The experiment was conducted on a nursery school located near the centre of Athens. The layers of green roof installed on the rooftop of the first floor were made of local wild vegetation, soil substrates, and hydroponic stone wool for water storage; geotextile acted as the drainage layer and a polymeric membrane acted as water proofing and root repellent. The roof was 40% covered by the green roof system (Santamouris et al., 2007). The findings showed that the green roof system provided significant savings for cooling loads during summer but not during winter, where the findings on the heating load were insignificant. The study revealed that during summer, green roofs conveyed higher annual cooling load reduction on non-insulated buildings compared to insulated buildings at 15% to 49% respectively, for the whole building. The cooling load yielded even higher amounts of reduction for the first floor, which was positioned precisely under the green roof, at up to 76%. Hence, this result explicitly suggested that the installation of green roofs provided energy savings in terms of cooling demands of the building (Santamouris et al., 2007).

Another study by Niachou et al. (2001) was conducted to investigate the thermal properties as well as the energy efficiency of a green roof system upon a building in Athens. The study indicated that green roofs on non-insulated buildings provided better thermal performance compared to well-insulated buildings. The study documented a significant exterior roof surface temperature reduction due to the existence of green roofs, as compared to bare roofs, by 10°C. It was found that the indoor air temperature with green roofs was lower by 2°C compared to bare roofs. The surface temperature of the green roof varied according to the types of vegetation analysed by the study. Thick, dark green vegetation created lower temperatures compared to sparse red vegetation and bare ground soil alone at up to 29°C, 38°C and 40°C respectively.

The heat transfer coefficient of non-insulated green roofs was found to be better compared to insulated buildings at 16 W/(m^2K) and 0.06 W/(m^2K), respectively. This result indicated that green roofs of non-insulated buildings have better thermal resistance than insulated roofs. Furthermore, the study evidently verified that the annual energy savings for green roofs on non-insulated buildings was at 37% and had the potential to increase to 48% when the night ventilation of air change rate per hour (ACH) of 10 was applied (Niachou et al., 2001).

An experimental study was conducted upon a green roof system on top of a low rise five storey commercial building with a roof area of 966m^2. The study was conducted under the hot and humid climate of Singapore. The findings highlighted that the installation of green roofs is significant in reducing thermal heat transfer and it also reduces energy consumption of a building. The study proved that the installation of green roofs could result in annual energy consumption savings of up to 15%. The study also indicated that for space peak cooling loads, green roofs are able to provide savings of 17% to 79% (Wong et al., 2003).

An experimental field study was conducted in order to determine the effect of green roofs on the annual energy requirements for cooling and electricity usage. The study was carried out by Permpituck and Namprakai (2012) on a concrete slab roofing model. The field measurement result confirmed that thermal mass can decrease heat transfer into the building. The heat transfer decreases as the soil thickness increases. It was recorded that rooftops with soil depth of 0.1m and 0.2m could achieve up to 46% and 94% less heat transfer respectively, compared to exposed rooftops. Moreover, the annual energy consumption of rooftops with soil thickness of 0.1m and 0.2m was found to be less as compared to exposed rooftops, at 15% and 21% respectively.

The study also proved that lawn or vegetation planted on the green roof provides evaporative cooling for the building. Rooftops with soil thickness at 0.1m planted with savannah grass achieved 9.6% less heat transfer than bare soil and 23% less than the exposed concrete slab. Meanwhile, rooftops with soil thickness at 0.2m planted with savannah grass achieved less heat transfer compared to those planted with manila grass, at 8.8%. Overall, it was recorded that the annual energy consumption of buildings with green rooftops with 0.1m and 0.2m of soil thickness, was 31% and 37% less respectively, than that of buildings with exposed roof surface. The lowest annual energy consumption for a building for cooling demand was found on a green roof system with 0.2m wet soil thickness planted with savannah grass at 279kWh.

Rumana and Hamdan (2009) through their study indicated that the application of potted plants is less efficient compared to growing plants directly on the rooftop. Therefore, based on several empirical studies, it can be inferred that green roofs are able to provide annual energy savings of about 15% to 49% for buildings.

ENERGY SAVINGS OF GREEN WALL

Wong et al. (2009) conducted a study on vertical greenery system or green facade system to identify the effects of vertical greenery systems on the temperature and energy consumption of a building. The results indicated that vertical greenery provides a passive cooling effect for the building and thus reduces the energy cooling load for the building. It was found that greenery coverage is the crucial

factor in determining the cooling load provided by the vertical greenery system. The study reported that the vertical greenery system was found to be able to reduce energy cooling load demand by approximately 32%, depending on the greenery coverage on the system.

Haggag et al. (2014) revealed that green living walls reduced indoor air temperature under the hot and arid climate of Abu Dhabi. The study was conducted on an in situ living wall on a school building. The living wall was constructed using plastic planter boxes with dimensions of 30cm x 30cm x 25cm, which were attached permanently on the external surface of the wall structure, which was layered with waterproof membranes, equipped with drip irrigation and covered with plant foliage. The study compared the thermal performance of the living wall with the bare wall. It was found that the living wall could reduce the peak time indoor temperature by at least 5°C during the hottest month in July. The study also quantified the savings for cooling load. The cooling load reduced from 1.35 MWh to 1.07 MWh, resulting in 20% energy savings for cooling via the deployment of a green wall (Haggag et al., 2014).

Kontoleon and Eumorfopoulou (2010) conducted an experimental study on the influence of the orientation of green walls on the thermal performance of a building. The study modelled a green wall with 20cm thickness placed on four directions of a building, during summer time in Greece; specifically, north wall, south wall, east wall and west wall. The finding indicated that the west oriented wall had the highest annual cooling load at 18%.

Wong, Tan, Tan, Chiang and Wong (2010) conducted an experimental study to investigate the thermal performance among several configurations of vertical green facade under the tropical climates of Singapore. There were 8 configurations of vertical green facades analysed in the study and 1 bare concrete wall without vegetation as a control wall. All facades were made of concrete walls with width, height and thickness of 4m, 8m and 0.3m respectively. The study concluded that grid and modular panels are the best green wall configurations that could be used to reduce the facade temperature under hot and humid climates. Therefore, based on several empirical studies, it is concluded that the integration of green living walls with buildings is able to provide annual energy savings of about 18% to 32%.

METHODOLOGY

The first objective is to scrutinize annual energy savings conveyed by green roofs and green walls based on the electricity consumption of residential buildings in Malaysia. The percentage of annual energy savings conveyed by green roofs and green walls was mainly derived from published empirical field and experimental findings that were conducted under hot and humid climates which are comparable to the Malaysian climate. This data was gathered and analysed using meta-analysis. Meta-analysis is aimed at synthesizing different studies that are

independent of one another but are also compatible. This process makes it possible to provide new perspectives on a particular subject.

In order to translate this percentage into annual electricity savings, the average annual electricity consumption for residential buildings in Malaysia was determined. The average monthly energy usage for residential buildings is in Kilowatt hours per month (kWh/month). The percentage was then converted into total annual amount of energy reduction in kWh. The total amount of energy reduction (kWh) was multiplied with the current electricity tariff for residential buildings to determine the annual electricity savings conveyed by both green components. Figure 3 below demonstrates the flow to determine monetary annual energy savings in electricity bills conveyed by green roof and green wall systems.

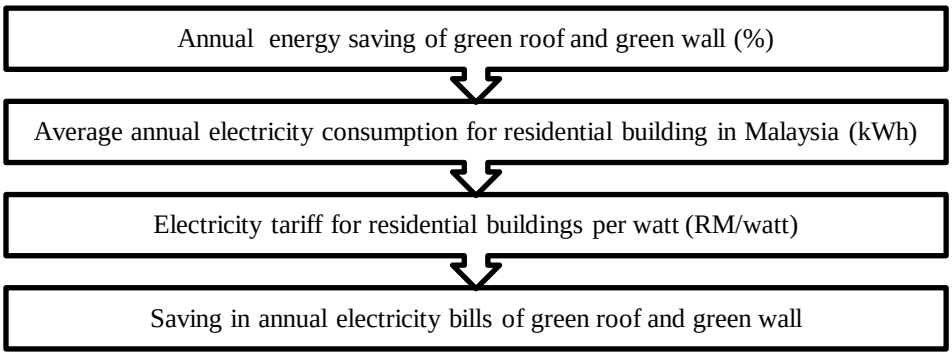

Figure 3: Methodology to determine annual electricity saving of green roof and green wall

FINDINGS ON ANNUAL ENERGY SAVINGS OF GREEN ROOFS AND GREEN WALLS

The annual energy savings of green roof and green wall systems were calculated based on the average energy consumption of residential buildings in Malaysia. The charges or tariff of the electricity varies according to the level of electrical usage of each residential building. The range of electrical tariff starts from RM 0.218/watt for the first 200kWh monthly to RM 0.454/watt for 901kWh onwards monthly. The monthly minimum charge for electricity bill is RM 3.

The average electricity consumption for residential properties in Malaysia is about 350 kWh per month which is equal to 4200 kWh per year. Therefore, the average electricity usage for residential buildings in Malaysia is assessed at 4200 kWh per year. This indicates that the average annual electricity bill for residential buildings in Malaysia is RM 1,225 per annum. Table below shows the calculation for the savings in electricity consumption and monetary savings in annual electricity bills conveyed by green roof and green wall systems. This study adopted the minimum percentage of annual energy saving conveyed

by green roofs and green walls. The calculation is based on the minimum annual energy savings. The formula for the calculation is as below.

Annual electricity saving (RM) = AES x AEC x Tariff

AES = Minimum annual energy saving (%)
AEC = Average annual electricity consumption (Kwh)
Tariff = Electricity rates for residential (RM)

Table 1: Annual saving in electricity consumption conveyed by green roof and green wall

Green envelope components	Minimum annual energy saving (%)	Average annual energy consumption (kWh)	Annual saving in electricity consumption (kWh)	Annual electricity bills saving (RM)
Green wall	18	4200	756	166
Green roof	15	4200	630	139

From the table above, it can be seen that the minimum amount of annual electricity savings conveyed by green roof and green wall setups based on average electricity consumption of residential buildings in Malaysia, are RM 139 and RM 166, respectively. This finding clearly shows that the integration of green walls with residential buildings is able to produce more electricity bill savings as compared to green roofs. The finding shows that the integration of green walls is able to reduce the bill by RM 166 per year which is about RM 27 more than the annual energy savings of green roofs. This finding is interesting as it proves that the integration of green walls may surpass the annual energy saving benefits conveyed by green roofs. This implies that the application of green walls is appropriate and significant for a country like Malaysia, which receives a large amount of sunlight per year. Nevertheless, the integration of green roofs is also considered as beneficial in conveying annual energy savings of RM 139 at minimum.

CONCLUSION

This study measures and compares the annual energy savings provided by green roofs and green walls on residential buildings in Malaysia. The estimation was based on the average annual energy consumption of residential buildings in Malaysia. This study has statistically proven that the integration of both green roofs and green walls is significant and appropriate for countries like Malaysia that receive a large amount of sunlight per year. The outcome has shown that the integration of green walls provides greater annual electricity savings compared to green roofs.

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EXPLORATION ON THE DEFINITION AND THE REAL MEANING OF CORPORATE REAL ESTATE TERM

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Abstract

Corporate Real Estate (CRE) is not a new term in the field of property research. In fact, disciplines of CRE research are becoming increasingly widespread nowadays. Consequently, the interpretation of CRE term has undergone a paradigm shift as time goes by. This study explored the definitions of CRE in the eyes of academicians and researchers as well as the meanings of CRE based on Malaysian Accounting Standard Board (MASB). Literatures were chosen to illustrate the breadth of knowledge available regarding the CRE definition. The broad definition of Corporate Real Estate (CRE) term (*since 1983 to 2016*) has been presented in the form of table. The discussion on the definition of CRE involves four phases, where each phase consists of 10 years. This allowed the researcher to see whether there were any changes or improvements to the definition of CRE in the last 40 years. Then, the CRE meaning was further examined, but from a different perspective. Therefore, content analysis of annual reports prepared by 40 Malaysian non-property public listed companies was conducted in order to identify the CRE term that has been applied in their companies. It was found that the CRE term was not adopted to represent real estate of a particular company. This study managed to identify 29 different terms that represent corporate real estate assets, of which nine (9) are used to represent "*building*" while six (6) are used to represent "*land*". However, to understand the CRE of a company, the terms used in the company annual report are insufficient. What is more important is to recognise the information related to the CRE asset value. The information is not only intended to illustrate the wealth of company CRE assets, but also to pinpoint anything that happens to CRE such as depreciation, disposal, etc.

Keywords: corporate real estate, land, building

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INTRODUCTION

Corporate Real Estate (CRE) is not a foreign term for companies all around the world since its introduction 30 years ago. In this regard, Zeckhauser and Silverman (1983) definition of CRE is still relevant and is still widely used by many researchers and academicians to describe the real meaning of CRE. According to Zeckhauser and Silverman (1983), corporate real estate can be defined as any land or buildings that are owned by non-property companies. However, according to Brown et al. (1993), the term CRE is not just limited to real estates owned by a company. It is also applicable to any property leased by a company. In addition, CRE also refers to the use of real estate for a company's business operations and any other related activities (Brueggeman & Fisher, 2001).

Several local researchers have illustrated the real scenario of CRE practises in Malaysia (Iskandar, 1996; Hwa, 2003, 2005; Zaiton, McGreal, & Adair, 2006; Zaiton, McGreal, Adair, & Webb, 2008; Marwani & Zaiton, 2012; Nurul Nabila, Mohd Lizam, Ahmad Kaseri, Abdul Jalil, & Asmahani, 2015). According to Zaiton et al. (2008), 76% of Malaysian companies adopted CRE strategies that were in line with the Nourse and Roulac framework (Nourse & Roulac, 1993). This illustrates the emergence of a trend encouraging CRE practices among these corporations. There were also evidences indicating that CREs were important assets in a company's balance sheet (Hwa, 2005). The study was conducted on the real estate wealth of listed, non-property companies in Malaysia, and found that 35% of market capitalizations for Bursa Malaysia were sourced from CRE. This amounted to a value of approximately RM216 billion. Besides that, corporate real estate also contributed to 36% of the net tangible assets, 34% of the shareholder's equity, 27% of total capital employed, and 19% of total tangible assets for public listed companies for the period of 1995-2001 (Hwa, 2005). As evident from these researches, CRE are undoubtedly important for Malaysian companies.

Previous studies were more towards discussing the importance of CRE by looking at the role played by CRE in generating income and creating wealth to the companies. What was rarely done includes giving enlightenment about the true meaning of corporate real estate by discussing on the definition of CRE term. However, further questions arose; why the meaning of CRE should be clearly understood and what is its significance? Previous studies have discussed some of the problems faced by CRE executives due to the lack of knowledge on the field of CRE, which in turn affected the effective communication between the CRE department and the top management of the company.

A study conducted by Lambert, Poteete and Waltch (1995) identified some constraints faced by the CRE executives worldwide with regards to their responsibilities and roles they play in an organisation. These constraints include the lack of power, resources, or required knowledge. In addition, Manning and Roulac (1996) explored the problems experienced by CRE managers with senior

management and business units' managers to effectively communicate. Ineffective communication can affect corporate strategic planning to maximise company's performance when the creative decision on real estate or operational decision could not be made properly (Manning & Roulac, 1996).

Thus, the mutual understanding of anything related to a company's CRE should be strengthened so that consensus can be achieved, especially in regards to the company's financial decision making on owning corporate real estates. Rodriguez and Sirmans (1998) pointed out that all decisions related to real estate could affect a company's expected revenue and share prices. Therefore, a CRE officer is generally responsible for convincing senior decision makers in any decisions related to the management of CRE assets so that the property would not be classified as a liability that need to be minimised, rather as an asset than need to be optimised (Lindholm, Gibler, & Levainen, 2006). However, a study conducted by Krumm and De Vries (2003) found that the effect of real estate decisions can rarely be related to a CRE manager's corporate performance. Thus, they suggest that CRE officers should have better understanding and knowledge to evaluate the true value of a corporate property and the impact of CRE on the company's livelihood.

Hence, to get crystal clear of the real meaning of CRE, this paper explored the definitions of CRE in the eyes of academicians and researchers as well as the meanings of CRE based on Malaysian Accounting Standard Board (MASB).

DEFINITIONS OF CORPORATE REAL ESTATE

Corporate Real Estate (CRE) is not a new term in the field of property research. In fact, disciplines of CRE research are becoming increasingly widespread nowadays. Consequently, the interpretation of CRE term has undergone a paradigm shift as time goes by.

Table 1 below presents the broad definition of CRE term that has been used since 1983 to 2016. The discussion on the definition of CRE involves four phases, where each phase consists of 10 years. This allows researcher to see whether there were any changes or improvements to the definition of CRE in the last 40 years.

Table 1: Definition of Corporate Real Estate (CRE)

Year	Authors	Definition of CRE
1983	Zeckhauser & Silverman	The land and buildings owned by companies not primarily in the real estate business
1988	Dresdow & Tryce	Real estate leased and controlled by the corporation
1990	Nourse	The management of real property assets for use in business other than real estate

1992	Joroff	The land and buildings used for work space, infrastructure and investment.
1993	Brown et al.	Corporate real estate management (CREM) is the optimum use of all real estate assets utilised by a corporation in pursuit of its primary business mission
1993	Brown et al.	Real properties that house productive activities of a company whose primary corporate purpose involves producing goods and services, but that incidentally owns and/ or leases and manages real estate to achieve corporate productions and objectives
1999	O'Mara	CRE – encompass all aspects of the physical settings of the organizations
1999	Nelson, Potter, & Wilder	Real estate assets which represent a significant proportion of firm value.
1999	Roulac	CRE is real property that house productive activities of a traditional corporation
1999	Booth	CRE is the quickest and most direct solution for companies looking to increase value by controlling the cost base
2000	Kooymans	"Corporate Real Estate" is a term that is generally used in a broad sense to refer to real estate owned by a corporation, whether it is for investment or for use
2001	Brueggeman & Fisher	The use of real estate as part of business operations and their activities are commonly referred as CRE
2002	Wills	Real property assets that is essential for its production or continuance in business. It does not include those real property assets that are held for investment purposes.
2003	Krumm & De Vries	Corporate Real Estate is a substantial asset base and an important cost factor
2010	Hartmann, Linneman, Pfnur, Moy, & Siperstain	Owing to its enormous asset value and associated costs, real estate is increasingly recognized as an important competitive factor among non-real estate related firms.
2013	Khanna, Van Der Voordt, & Kopples	CRE can be seen as a secondary channel of corporate communication.
2014	Abdul Jalil & Heywood	CRE contribution move beyond physical contribution into intangible roles, including human resources and financial contributions.
2016	Zhao & Sing	CRE is the single largest fixed capital investment of many public listed firms which not substitutable by other capital goods, such as equipment and plants.

In the early phase (1981-1990), studies have interpreted that the term of CRE in the simple form and easy to understand. The most common use of CRE definition was introduced by Zeckhauser and Silverman (1983), which refers to land and buildings owned by companies not primarily in the real estate business. Nourse (1990) also defined the CRE as the management of real property assets for use in business other than real estate. If observed carefully, the term "*real property assets*" used by Nourse (1990) is actually represented by the "*land and building*" which have been asserted by Zeckhouser and Silverman (1983). In fact, there are also similarities to the phrase "*companies not primarily in the real estate business*" with "*business other than real estate*". Both of these definitions explained that CRE involves the function of real estate asset as a factor of production and not the end product of the organisation.

Meanwhile, Dresdow and Tryce (1988) viewed CRE as a real estate leased and controlled by the corporation. This definition translates the meaning of CRE with a different ownership concept where the term *"leased"* illustrates that the corporation does not necessary own the property asset to run their business operation, but adequate for them to lease the land, building or just a part of business space only. However, the existence of the "*controlled*" term in the definition should be emphasized because even if the property is just a lease property, but the company must ensure that real estate should be organized in a proper management.

The second phase (1991-2000) shows that CRE has been defined in more detail especially about how CRE plays its role or function in a business organisation. Joroff (1992) described CRE as the land and buildings used for work space, infrastructure and investment. He also claimed that CRE is as strategic a resource as information, employees or technology. In addition, Kooymans (2000) defined CRE as a term that is generally used in a broad sense to refer to real estate owned by a corporation, whether it is for investment or for use. Both definitions shared the same view on the importance of CRE, which is to provide space for working or as an investment alternative for the companies. CRE definition has been expanded with the addition of the "*investment*" term and became something interesting to be discussed. Both researchers agreed that real estate investment in a business organisation is also part of CRE activities.

Brown et al. (1993) and Roulac (1999) defined CRE as real properties that house productive activities of a company. The main idea to focus is the use of CRE as working space provider either to the goods or services sector. However, there was a continuity in the definition of CRE by Brown in the same year. He indicated that CREM is the optimum use of all real estate assets utilised by a corporation in pursuit of its primary business mission. This time, he tended to incorporate the "*management*" term when clarifying the meaning of CRE. The significant point in Brown's definition is an effective and efficient management on the utilization of real estate asset. In order to achieve business goal, the highest

and best use of real estate asset which represent the term "*optimum*" should be implemented.

Meanwhile, O'Mara (1999) defined CRE as encompassing all aspects of the physical settings of the organizations. This definition clearly shows that CRE has numerous functions involving decision relating to real estate such as determining whether to lease or purchase property, determining the location of new office, or deciding on the disposal excess property. Besides that, CRE is also viewed as real estate assets which represent a significant proportion of firm value (Nelson et al., 1999). The real estate asset intensity, which is the total property (land and building) from the total assets of the companies, reflects what is mean by the "*significant proportion*" term. However, this term also can be interpreted as the proportion of real estate from the total cost of the companies. In addition, Booth (1999) described CRE as the quickest and most direct solution for companies looking to increase value by controlling the cost base. This definition suggests that real estate has a very direct impact upon shareholder value.

Most of the CRE definition in the third phase (2001-2010) emphasized on the significance of CRE. For example, Brueggeman and Fisher (2001) referred to CRE as part of business operations. This definition shared similar meaning of CRE with the definition that was used by Wills in 2002. He defined CRE as real property assets that are essential for its production or continuance in business. However, it does not include those real property assets that are held for investment purposes. Then, the significance of CRE to a firm can be reflected through the definition of CRE given by Krumm and De Vries (2003) where CRE is a substantial asset base and an important cost factor. The term "*cost factor*" referred to the rising cost of CRE management like rental payment, leased, taxes, utilities and others.

Definition by Krumm and De Vries (2003) was then expanded by Hartmann et al. (2010) when they incorporated the element of "*competitive factor*" in their CRE definition. They asserted that real estate is increasingly recognized as an important competitive factor among non-real estate related firms due to its enormous asset value and associated costs. In fact, companies around the world faced challenges in coordinating corporate real estate management in recent years.

There has been some improvement in the definition of CRE as interpreted by recent researchers align with the era of globalisation. Khanna et al. (2013) asserted that CRE can be seen as a secondary channel of corporate communication. This definition clearly states that, CRE can be described as a symbol of corporate identity. Establishment of a company on iconic buildings within prime locations will convey messages to their employees, clients and other stakeholders on their corporate branding as well as their values. Meanwhile, a study conducted by Abdul Jalil and Heywood (2014) has defined CRE by considering the contribution of CRE from a holistic perspective. They asserted

that CRE has undergone a paradigm shift from simply providing workplaces to employees (*physical contribution*) to diversifying CRE contribution in wide areas (*intangible roles*) namely, human resources, finances, internal culture development, improved productivity, and marketing. According to the latest research done by Zhao and Sing (2016), CRE is the single largest fixed capital investment of many public listed firms which not substitutable by other capital goods, such as equipment and plants. This definition denies the involvement of plant and equipment when explaining the roles played by CRE since they are not fixed and can usually be moved or relocated.

IDENTIFICATION OF CRE IN PUBLIC LISTED NON-PROPERTY COMPANIES' ANNUAL REPORT

The earlier discussion on CRE definition only focused on the definitions given by researchers and academicians. In this section, the CRE meaning will be further examined, but from a different perspective. Therefore, content analysis of annual reports of 40 Malaysian non-property public listed companies was conducted in order to identify the CRE term that has been applied in their companies.

According to the annual reports prepared by Malaysian corporate firms, the CRE term was not adopted in the Financial Statements to represent real estate of a particular company. However, in the corporate world, especially in Malaysia, the use of Property, Plant and Equipment (PPE) term is more synonymous to describe matters associated with real estate elements. Normally, a detailed description of the PPE value which is presented in the company annual report can be found in the Statements of Financial Position. In specific, it falls under the category of Notes to the Financial Statements, which is also known as Significant Accounting Policies. In fact, some important aspects related to PPE are specifically emphasised; cost, depreciation, impairment, gains or losses on disposal, asset exchange transaction as well as repairs and maintenance.

According to the Malaysian Accounting Standard Board Standard 15 (MASB, 2000), PPE is defined as tangible assets that:

(i) are of held by a company for use in the production or supply of goods or services, for rental to others, or for administrative or maintenance purposes
(ii) are expected to be used during more than on reporting period.

This definition indicates that, PPE is operating fixed assets which are used for operations of the business on a continuing basis in order to generate revenues. There are two indicators that have been used by MASB15 in the recognition of PPE; an item of PPE should be recognised as an asset when it is probable that future economic benefits associated with the asset will flow to the company and the cost of the asset to the enterprise can be measured reliably.

When land and building are to be recognised as assets, the initial cost of the land and building as fixed assets will include the costs of bringing the land

and building into working condition for their intended use such as the cost of site preparation, installation, set-up, etc. In order to classify items of PPE, CRE assets have been categorized in accordance with the similar nature of use of those assets in the operations of a company. Examples of separate classes that encompass CRE assets of PPE are provided in MASB15 (item 41) as "*land*" and "*land and buildings*". However, this does not mean that the CRE definition in annual report is only bound by the term "*land and buildings*".

In fact, according to the outcome of the content analysis of annual reports, there are other terms that are used in the company annual reports to define CRE. Table 2 shows the PPE classification that is related to CRE.

Table 2.2: Classes of PPE that Relate to CRE Assets

The classification of CRE	The terms used to represent CRE assets	The number of companies that use the terms
Land	Land	1
	Freehold land	27
	Leasehold land	7
	Long term leasehold land	13
	Short Term Leasehold Land	8
	Prepaid land and land improvements	1
Buildings	Buildings	26
	Building on freehold land	2
	Buildings on long term leasehold land	1
	Freehold Building	4
	Leasehold buildings	2
	Long term leasehold building	1
	Buildings and civil works	1
	Buildings and improvements	2
	Buildings, factory and civil works	1
Land and Buildings	Land and Buildings	2
	Freehold Land and Building	2
	Long Leasehold Land and Building	1
	Short Leasehold Land and Building	1
Others CRE	Freehold Estates	1
	Freehold Estates Land	1
	Oil Palm Plantation	1
	Workshop	1

Based on Table 2 above, there are 29 different terms that represent corporate real estate assets, of which nine (9) are used to represent "*building*" while six (6) are used to represent "*land*". In general, most corporations tend to only use the term "*building*" in the PPE classification. However, when it comes to the use of the term "*land*", the situation is different. This is because, most of the companies will particularise more information regarding the type of land tenure, either freehold or leasehold. If the land is leasehold, some companies state the lease period, either short term or long term leasehold. Besides, there are some companies that take CRE report lightly, in which the terms are combined as "*land and buildings*" in the PPE note section. This means that separate information regarding the real value of "*land*" and "*building*" cannot be identified in a transparent manner.

Simpson and McDonagh (2010) identified that there were 40 separate classes that have been used by various public listed companies in reporting the CRE assets. They found that there was a lack of consistency by management in naming separate classes and their results also revealed that management were confused as to whether or not to separate out freehold and leasehold of CRE assets.

However, to understand the CRE of a company, the terms used in the company annual report are insufficient. What is more important is to recognise the information related to the CRE asset value. The information is not only intended to illustrate the wealth of company CRE assets, but also to pinpoint anything that happens to CRE such as depreciation, disposal, etc. Thus, it is crucial for researchers to master the basic methods in identifying CRE in company's Financial Statements.

CONCLUSION

Discussion in this paper was divided into two major parts. It began with a review of CRE definition by exploring the real meaning of CRE in the eyes of academicians and researchers. In order to see whether there were any changes or improvements to the definition of CRE in the last 40 years, broad definition of CRE term that has been used since 1983 to 2016 was presented. This study has identified that the interpretation of CRE term has undergone a paradigm shift as time goes by, where CRE can be defined as any land or buildings that are owned or leased by non-property companies which can be used for a company's business operations and any other related activities.

Then, the CRE meaning is further examined from different perspective in order to identify definitions used to represent real estate assets, as stated in the selected companies' annual reports. As a result, the terms such as PPE were more synonymous in the corporate world. However, based on the PPE classification associated with CRE, there were 29 terms that have been used to represent "land" and "building". This study also found that separate information regarding the real

value of "*land*" and "*building*" cannot be identified in a transparent manner because of there were some companies that take CRE report lightly. Besides that, inconsistencies in naming separate classes have also became one of the issues faced by some corporate companies.

In conclusion, this study has made several contributions to the knowledge base of CRE. The main contribution of this study is the exploration on the paradigm shift of the broad definition of CRE. This study also serves as a future reference for academicians or researchers on the clarification of the terms that have been used in representing CRE in Malaysian companies' annual report. Therefore, a better understanding to evaluate the true value of a corporate property will be mastered by having enlightenment about the true meaning of CRE.

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ZAKAT AND *WAKAF* FUNDED HOUSING FOR THE POOR AND NEEDY – AN ANALYSIS OF THE *ZAKAT* AND *WAKAF* AUTHORITIES ROLES FROM THE AUTHORITIES' PERSPECTIVES

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Abstract

This paper concerns the provision of affordable housing for the poor and needy Muslims through *zakat* and *wakaf* funding. The study's objectives are to determine whether *zakat* and *wakaf* resources are employed therein, examine the roles of the *zakat* and *wakaf* authorities, and identify constraints and the ensuing strategies. The study was carried out through desk research and interviews with representatives of selected z*akat* and w*akaf* authorities. Key findings from the study are that *zakat* and *wakaf* are involved in the provision of affordable housing for the poor and needy Muslims and that their funds have been employed therein. However, their roles are dissimilar, therefore, each authority has its own *modus operandi*. In addition, both *zakat* and w*akaf* authorities have constraints in the availability of expertise to undertake the procurement of housing development and they address this problem through collaborative working styles, with each other, and with private property developers.

Keyword: funding, housing, procurement, *wakaf, zakat*

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INTRODUCTION

In Islam, *zakat* and *wakaf* are the two most important socio-economic tools aimed at equitable distribution of wealth among the *ummah*. Literature has reported on how *zakat* and *wakaf* have been employed and would continue to be employed to reduce poverty and to improve the living conditions of the *ummah*. However, most of the initiatives reported thus far appear to focus on addressing rudimentary problems: in the case of *zakat* in the provision of daily sustenance of the poor and needy and in the case of *wakaf* in the provision of basic Islamic infrastructures such as burial spaces for Muslims, building of *suraus*, mosques, religious schools and the likes. These efforts are not to be considered insignificant, but it is contended that improving living conditions of the Muslim *ummah* should include initiatives that extend beyond addressing these rudimentary problems.

One area that requires urgent attention is housing. Literature has been highlighting issues of housing inadequacies and affordability facing the poor and needy Muslims and others (Khairuddin, Sharina, & Azila, 2014; Nadiah, Ali, Halim, & Noor, 2016; Khazanah Research Institute, 2015; Cagamas, 2013; Azila, Khairuddin, & Sharina, 2015)(Khairuddin, et al., 2014; Nadiah, et al., 2016; Khazanah Research Institute, 2015; Cagamas, 2013; Azila, et al., 2015). Given that within the context of modern economy and *maqasid shariah*, the provision of shelter is considered a basic necessity and if the poor and needy Muslims could not afford to meet this needs, hence, an unpretentious question comes to mind: could *zakat* and *wakaf* be employed to help the poor and needy Muslims in the provision of housing in a big way?

Available literature suggests that initiatives in the provision of housing for the poor and needy Muslims utilizing *zakat* and *wakaf* funds are being done but they remained sparse and lacking in detailed and critical assessments (Khairuddin, et al., 2017; Mohit & Nazyddah, 2011) (Khairuddin et al., 2017; Mohit & Nazyddah, 2011). In addition, there is a lack of published data and information on the roles of the *zakat* and *wakaf* authorities, constraints they faced and the strategies they employed, in the provision of housing for the poor and needy Muslims.

This paper reports on a study on the roles of the *zakat* and *wakaf* authorities in the provision of adequate and affordable housing for the poor and needy Muslims. The objectives of the study are; (i) to determine whether *zakat* and *wakaf* resources are being employed in addressing the problems of affordable housing among the poor and needy Muslims, (ii) to examine the roles of the *zakat* and *wakaf* authorities therein; and (iii) to identify constraints facing the *zakat* and *wakaf* authorities in performing their roles and the appropriate strategies to alleviate or remove the identified constraints. The study was carried out through desk research and intensive interviews with representatives of selected *zakat* and *wakaf* authorities.

This paper is structured into five sections. Following the Introduction, an overview of *zakat* and *wakaf* is presented. This is followed by a review of the housing problems faced by Malaysians focusing on the poor and needy Muslims and initiatives taken by the authorities including by the *zakat* and *wakaf* in addressing the problem. In the subsequent section, a critical examination of the roles of the *zakat* and *wakaf* authorities in the provision of adequate and affordable housing for the poor and needy Muslims would be conducted. Finally, the paper offers a conclusion highlighting the key findings from the study.

OVERVIEW OF *ZAKAT* AND *WAKAF*

Zakat

In Islam, *zakat* refers to the act of making a contribution of one's wealth, on condition that he meets the prescribed criteria[i], to the designated *zakat* recipients or *asnafs* (Quran *Surah At-Taubah*, 9:60). The act of giving away one's wealth, in this instant is compulsory, to help others in need for the sake of Allah SWT is akin to one making effort to purify his wealth.

Zakat in Malaysia is administered by the respective State Islamic Religious Councils (SIRCs) or *Majlis Agama Islam Negeri* (MAINs). The SIRCs are responsible to collect *zakat* contributions and disbursing them to the *asnafs*. In addition to disbursing *zakat* in the form of cash, the SIRCs are also utilizing the *zakat* monies to provide assistance including scholarships, building or repair of homes and religious schools, education, medical and health facilities and the likes.

Wakaf

In Islam, *wakaf* refers to an act of giving away of one's belongings, irrespective of amount or value, such as a piece of land, a house or cash to a person/persons/community for the recipient to enjoy the benefits derived therefrom for an indefinite period[ii]. *Wakaf* is not an obligation but Islam strongly encourages its followers to endow their belongings to help the poor and needy (Quran *Surah Al-Hajj*, 22:77 and *Al-Baqarah*, 2: 267).

Like *zakat*, the administration of *wakaf* in Malaysia falls under the respective SIRCs. The SIRCs are responsible to register, administer and implement all policies and projects entrusted to them as per the relevant States *wakaf* enactment. Review of available literature shows that authorities in Malaysia adopted a rather traditional style in administering the *wakaf* assets and properties under their care. In most cases the endowed assets and properties are utilized for religious related activities although there are SIRCs that have begun to embark on commercially oriented property development including housing projects(Rohaya & Rosli, 2014; Rabiatul, et al., 2017; Khairuddin, et al., 2017;

Khairuddin, et al., 2014) (Rohaya & Rosli, 2014; Rabiatul, Latifa, & Norhanizah, 2017; Khairuddin et al., 2017; Khairuddin et al., 2014).

AFFORDABLE HOUSING PROBLEM FACING THE POOR AND NEEDY MUSLIMS

The Affordable Housing Problem

Malaysia is facing a major housing affordability problem and that the problem is acuter in the urban areas (Khazanah Research Institute, 2015)(Khazanah Research Institute, 2015). An affordable housing market should sit in within the 3.0 times the median annual household income, but in 2014 the median house prices for Malaysia as a whole and for Kuala Lumpur stood at 4.4 times and 5.4 times the median annual household income respectively. The figures indicate that Malaysia is facing 'seriously unaffordable' and 'severely unaffordable' housing markets (Khazanah Research Institute, 2015)(Khazanah Research Institute, 2015). The above findings are consistent with the findings made by Cheah, Almeida, Muhamad and Lim (2017). They observed that the current housing affordability problem stems out not from the lack of housing stocks but due to supply-demand imbalances, and that the imbalances have increased since 2015. They argued that the prices of most new launches do not match the households' affordability.

In the context of affordable housing for the poor and needy Muslims the problem appears to continue unabated (Khairuddin et al., 2017; Azila et al., 2015; Nadiah et al., 2016)(Khairuddin, et al., 2017; Azila, et al., 2015; Nadiah, et al., 2016). For instance, in 2014 the estimated shortfall of affordable housing for Malaysia as a whole stood at 960,000 units (Cheah & Almeida, 2016); and within that, the shortfall for the Muslims stood at about 480,960 units (Khairuddin, 2017)(Khairuddin, 2017)[iii].

In contrast to the works of Cheah and Almeida (2016) in which they suggested that the prices of affordable housing range between RM248,000 and RM261,000, most low and middle-income Malaysians are more comfortable to associate the term affordable housing with those styled under the "low cost/PPR" housing schemes. A low cost/PPR housing is defined by its selling price of between RM35,000 and RM42,000 per unit by the Malaysia Ministry of Housing and Local Government (Ministry of Urban Wellbeing, Housing, and Local Government Malaysia, n.d.) (Ministry of Urban Wellbeing, Housing, and Local Government Malaysia, n.d.). However, Khairuddin et al. (2017) claimed that even at this price range the problem of affordability among most low and middle-income Malaysians and especially the poor and needy Muslims persist.

The Roles of *Zakat and Wakaf* in the Provision of Affordable Housing

Zakat monies are only payable to the eight categories of recipients or *asnaf*s. The two most vulnerable categories of *asnafs* are the *fakir* and *miskin*. The former refers to one that has neither material possession nor means of livelihood while the latter is one with insufficient means of livelihood to meet basic needs. These categories of the *asnaf* are eligible to be assisted as provided under the *haddul kifayah* (poverty line under the *zakat* system).

Generally, the *zakat* authorities in Malaysia provide 32 types of assistance to the *asnaf*s including the provision of shelter, daily sustenance, clothes, medical and health, education and transportation (Jabatan Wakaf, Zakat dan Haji, 2008). In terms of shelter, *zakat* assistance covers repairs, the building of houses and down payment for purchasing new low-cost houses, the monthly rental and utility assistance and assistance for the building of new houses in collaboration with other agencies.

Published statistics on the detailed distribution of *zakat* funds for shelter across Malaysia is not available. However, an examination of the Selangor *Zakat* Board's *Lapuran Pengurusan Zakat Selangor* 2015 shows that the provisions of shelter, lumped together under social development programme, for *asnaf fakir* and *miskin* stood at repair and building new houses in 2015: RM27.8 million (2014: RM20.3 million); and house rental assistance in 2015: RM17.9 million (2014: RM 11.3 million). The said amount represents some 6.75% of the total *zakat* monies distributed to all *asnaf* for 2015 (2014: 5.30%). The total amount of *zakat* monies distributed in 2015 was RM676.047 million (2014: RM595.745 million) ((Lembaga Zakat Selangor, 2016)(Lembaga Zakat Selangor, 2016).

In contrast to *zakat*, *wakaf* authorities' initiatives in the provision of housing as a whole appear to be more active. However, their initiatives seem to be focusing on unlocking the values of *wakaf* land and properties. Initiatives on the development of low-cost housing including those designated for *asnafs* are still at their infancy (Khairuddin, 2017; Khairuddin et al., 2017)(Khairuddin, 2017; Khairuddin, et al., 2017).

A CRITICAL EXAMINATION OF THE ROLES OF THE *ZAKAT* AND *WAKAF* AUTHORITIES IN THE PROVISION OF ADEQUATE AND AFFORDABLE HOUSING FOR THE POOR AND NEEDY MUSLIMS

Preliminary Examination

On the basis of available literature, it appears that the focus of *zakat* authorities, in the provision of affordable housing, are on the *asnafs fakir* and *miskin*. In addition, the assistance appears to favour the *asnaf fakir* and *miskin* who are landowners or with permission to erect houses thereon, owners of houses needing repairs, tenants and those intending to purchase low-cost houses whereby the down payments are paid by the *zakat* authorities on their behalf. In addition, most

zakat housing being developed thus far appear to be comprehensive in style comprising residential, religious and common facilities. While such an idea is commendable as the development exhibits an ideal "Islamic village" but it would require a considerable sum of money to develop along with the appropriate land size. Small-scale developments or buying units direct from developers or from the secondary market were given less attention.

In the case of *wakaf*, data from published sources suggests that the initiative to utilize *wakaf* lands and assets for building affordable housing focusing on the low cost/PPR styles of residential units are still as its infancy. However, *wakaf* authorities seem to pay more attention towards property development initiatives aimed at unlocking the values of *wakaf* land such as in the commercial, medical and health and hospitality sectors (Khairuddin, 2017)(Khairuddin, 2017).

In carrying out their roles in the provision of affordable housing *zakat* and *wakaf* authorities were confronted with a variety of constraints. Topping the list of constraints are funding inadequacy, land matters (un-registered *wakaf* land, uneconomical *wakaf* land due to size, location, etc.) and constraint in the availability of expertise (Anan, 2015; Khairuddin et al., 2014) (Anan, 2015; Khairuddin, et al., 2014).

Some *zakat* and *wakaf* authorities have experimented with the idea of having *zakat* and *wakaf* working in collaboration in the provision of affordable housing to address the constraints they face. For example in Melaka, the RM2.27 million Al-Ehsan Flats at Tengkera was built using *wakaf* funds, *Baitulmal* funds, and surplus *zakat* funds. The residential units were rented out to the poor and single mothers at below market rates(Asmak, 2009) (Asmak, 2009). In this context, Khairuddin et al. (2014) have proposed a model for the *zakat* and *wakaf* authorities and private property developers to work on the basis of joint-venture. However, they pointed out several issues that must be resolved before the model can be adopted for use.

Fieldwork

A set of open-ended questionnaires was prepared and piloted. Thereafter, a series of intensive face to face interviews were conducted. The key objectives of the interviews were to solicit responses from representatives of six (6) selected and willing SIRCs with regards to the study's objectives. The rich qualitative data was collected, analysed, summarized and is presented in Tables 1, 2 and 3.

Table 1: Z*akat* in the provision of affordable housing

No	Key factors	Current status	Remark
1	Permissibility under *shariah*	Yes	Assistance that benefits *asnafs* only.

2	Land	Normally *zakat* does not own land	Current housing assistance to *asnafs* is limited to those that have legal rights of the site where the houses are to be built; help with payments of rent and utilities or down payment for low-cost housing; house repairs, etc.
3	Ownership	*Zakat* properties belong to the *asnafs* (*tamleek*)	*Zakat* properties are transferable to next-of-kin of the *asnafs* under *faraid*.
4	Funding	Generally, *zakat* is endowed with cash	Surplus *zakat* funds may be utilized as project funding (subject to conditions) on behalf of the *asnafs*. Subject to *fatwa*, the "housing" portion of *haddul-kifayah* may be expended towards housing the *asnafs* (i.e. paid on their behalf).
5	Expertise	Most MAINs do not possess the requisite expertise to undertake housing development projects	*Zakat* may form joint-venture with *wakaf* and private developers. The interest of *zakat* is limited to housing the *asnafs*. *Zakat* may become ready buyers of completed units that would subsequently be distributed or rented to *asnafs*.
6	Expertise to manage completed properties		
7	Demand for *zakat* built affordable housing	High	High demand as expressed by *asnafs* / residents of *wakaf* houses. Most claimed to be living in inappropriate housing.
8	Experience in collaboration with others	Yes	In some states, *zakat* has collaborated with *wakaf* (in housing the *asnaf*s).
9	Proceeds from the development	Not applicable	No returns expected. Incomes from rent collected should be channelled to enrich the *zakat* funds.
10	Motivation	*Zakat* authorities consider the provision of affordable housing for the *asnafs* is a problem to be handled by the State. They do undertake small scale projects.	

Table 2: *Wakaf* in the provision of affordable housing

No	Key factors	Current status	Remark
1	Permissibility under *shariah*	Yes	Assets belong to Allah SWT, only the *usufruct* is saleable on lease terms basis.
2	Land	Available	*Wakaf* owns sizeable land bank across Malaysia. The land is administered by the respective MAINs. Some site may

			have constraints thus, may require *Istibdal* to be done.
3	Ownership	Only to enjoy the *usufruct*. Land or assets created are Allah's property, MAINS are the administrators.	The land or created assets can only be leased to the buyer of the *usufruct* subject to the terms of the lease agreement. Ownership of the property is non-transferable, not even to next-of-kin.
4	Funding	Mostly constrained as almost all MAINs do not have funds in hand	*Wakaf* land can be used as sites for housing development and/or as collateral (subject to conditions), cash *wakaf*, *sukuk*, or form joint-venture with *zakat* and/or private developers.
5	Expertise to develop properties	Most MAINs do not possess the requisite expertise	MAINs may form joint-venture with private developers that have the capability to provide the necessary expertise to initiate, develop and market housing projects, construction and supervision, S&P and related legalities, home financing, collection of rents, maintenance, etc.
6	Expertise to manage completed properties		
7	Demand for *wakaf* built affordable housing	High	High demand as expressed by *asnafs* / residents of *wakaf* houses. They claimed to be living in inappropriate housing and lament on their inability to purchase or rent affordable houses.
8	Experience in collaboration with others	Yes	*Wakaf* has done works with private developers. *Wakaf* has collaborated with *zakat* in the provision of housing for *asnafs*.
9	Proceeds from the development	Subject to the style of development.	Proceeds from the development will be deposited into the *wakaf* funds of the respective MAINs. The funds are to be expended as prescribed by the *Wakeef* (donor).
10	The motivation for the development	Unlocking the value of *wakaf* land	1. Physical value – affordable housing for the needy and poor. 2. Monetary value – the enhanced value of present land and as income generation.

Table 3: Constraints encountered and strategies employed

No	Key factors	Constraints and Strategies	
		Zakat	*Wakaf*
1	Permissibility under *shariah*	Permissible but only for *asnafs*.	Permissible but the style of development is as prescribed by the *Wakeef*.
2	Land	*Zakat* does not own land.	*Wakaf* has no "real" land ownership problem.
3	Ownership of developed housing units	*Zakat* properties belong to the *asnafs* (*tamleek*).	*Wakaf* properties are non-transferable. Buyers only enjoy the *usufruct*.
4	Funding	Generally, *zakat* is endowed with cash but the monies are strict to be spent on the immediate needs of the *asnafs*.	*Wakaf* authorities do have funding issues. However, *istibdal* and newer approaches such as cash *wakaf, sukuk wakaf*, and selling of the *usufruct* on a lease basis are some of the strategies adopted.
5	Expertise	MAINs do not possess the requisite expertise to undertake housing development projects.	
6	Expertise to manage completed properties	*Zakat* may form joint-venture with *Wakaf* and private developers. The interest of *zakat* is limited to housing the *asnafs*. *Zakat* may become ready buyers of completed units that would subsequently be distributed or rented to *asnafs*.	

Discussion of the Results

From the results, the following are the key findings of the study;

- It appears that *zakat* and *wakaf* are not prohibited from being involved in the provision of affordable housing for the poor and needy Muslims. Evidently, *zakat* and *wakaf* funds have been employed in the provision of affordable housing for the poor and needy Muslims.
- The roles of *zakat* and *wakaf* in the provision of housing are dissimilar. *Zakat* has very focused and compulsory beneficiaries i.e. the *asnaf fakir* and *miskin*. However, *wakaf* has no "real" restriction on the beneficiaries unless otherwise specified by the *wakeef*.
- Availability of land for development is an issue for *zakat* but not for *wakaf*. However, *wakaf* has to seek ways in maximizing their land potential through innovative funding strategies including *istibdal*, cash, and *sukuk wakaf*.
- Ownership of the completed units; in the case of *zakat*, the units belong to the *asnaf* while in the case of *wakaf*, they remained the property of *wakaf*, only the *usufruct* can be enjoyed by the buyers.
- In terms of funding, while *zakat* may have surplus in their collection but their immediate concern is to spend the monies on the *asnafs*. This situation would

require re-interpretation of the *shariah* to facilitate *zakat* monies to be spent on projects that have a gestation period. *Wakaf* may resort to the more contemporary styles of raising funds that include *istibdal*, cash *wakaf*, *sukuk* and selling the *usufruct* on a lease basis.

- Both *zakat* and *wakaf* authorities have a constraint in the availability of expertise to undertake the procurement of property development. In addition to *zakat* and *wakaf* working in collaboration, these authorities have embarked on working with private property developers.

In short, while both *zakat* and *wakaf* are the two key tools for addressing the socio-economic problems facing the *ummah*, their *modus operandi*, specific expected outcome and beneficiaries are dissimilar. It is therefore understandable why in most cases *zakat* and w*akaf* authorities prefer to handle issues, problems, and solutions thereto within the context of their own individual setting.

The outcome from the study is considered significant in terms of (i) better understanding on the *modus operandi* and constraints faced by the *zakat* and *wakaf* authorities in performing their roles in the area of affordable housing for the poor and needy Muslims, (ii) to afford data and information for professional involved in the process of construction procurement and thereafter to be drawn into the activities of *zakat* and *wakaf* funded housing provision for the poor and needy Muslims; and (iii) to contribute in the process of transformation of *zakat* and *wakaf* to become a credible player in the procurement and maintenance of built assets and facilities especially in provision of affordable housing for the poor and needy Muslims.

CONCLUSION

This paper reported on a study on the provisions of affordable housing for the poor and needy Muslims funded by *zakat* and *wakaf* funds. The following are the key findings;

- *Zakat* and *wakaf* are not prohibited from being involved in the provision of affordable housing for the poor and needy Muslims.
- However, the roles of *zakat* and *wakaf* are dissimilar therefore each authority has its own *modus operandi*. Thus, an approach taken by one authority may not be applicable to the other especially on matters concerning the *shariah*.
- Both *zakat* and w*akaf* authorities have a constraint in the availability of expertise to undertake the procurement of property development. In this instant, *zakat* and *wakaf* are working in collaboration with each other as well as with private property developers.

The study's main limitation is inaccessibility to data. Therefore, the outcome of the study must be interpreted within this limitation. Consequently, further and in-depth study is required.

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[i] For the types of *zakat* and conditions and criteria on *zakat* contributions and the types of wealth subjected to *zakat* refer to publications such as the 'Syarat Umum Wajib Zakat' published online by Lembaga Zakat Selangor at www.zakatselangor.com.my.

[ii] In order for a *wakaf* to be valid it has to meet specific requirements in terms of the pillars, types and characteristics of *wakaf*. A full discussion of these requirements are not within the scope of the current paper. Readers may refer to (Khairuddin, et al., 2017).

[iii] The estimated shortfall of affordable housing for Malaysia as a whole stood at 960,000 units (Cheah & Almeida, 2016). Applying a simple estimate, based on Malaysia's population that comprise of 50.1% Malays and that they are Muslims, the proportion of shortfall for the Muslims is about 480,960 units (Khairuddin, 2017).

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AN EVALUATION OF FACTORS CAUSING VARIANCE IN PROPERTY ASSESSMENT

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Abstract

Most of the previous studies on causes of valuation variance have concentrated on non-statutory valuation, with little attention to statutory valuation in both developed and developing countries, leaving a gap in the body of knowledge in this regard. Purposive sampling was adopted to select samples from registered estate surveyors and valuers in Kwara State, Nigeria. The data collection was done through a survey questionnaire given to 33 valuers and the Relative Importance Index (RII) was used to analyse the data collected. Findings showed that factors that fell within the range index of significant factors (0.841 to 0.979) are: experience in rating valuation, comprehensiveness of the law, unrealistic valuation assumption and availability of market indices for the input variables. Other significant factors are explicitness of the law, integrity of the valuer, valuer negligence, absence of quality control and training in rating valuation. The findings have practical implications on rating valuation stakeholders.

***Keywords*:** rating administration, rateable value, significant factors, valuation

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INTRODUCTION

The essence of valuation in rating is to ensure fairness in property assessment (Ross & Duncan, 2012; Kelly, 2013). Valuation is the foundation of rating administration which consists of valuation, billing, collection and enforcement (UN-HABITAT, 2013; Bond & Brown 2017). The significance of valuation in rating administration cannot be over-emphasised; the World Bank even recognises this fact. As a result of the significance of valuation in rating administration, the World Bank often encourages the preparation of a comprehensive valuation list (Kelly & Musunu, 2000; Kayuza, 2014).

Valuation variance is the discrepancy in opinion of values between two or more valuers on the same property (Babawale, 2013; Mohammad, Ali, & Jasimin, 2018). The essence of the display of valuation list is to rectify the discrepancy between the values on the draft valuation list and that which the objectors claim to be the correct values (Bond & Brown, 2017). The effects of valuation variance in rating include tax evasion, tax avoidance and unrest, among many others (Bello, 2014; Fatoki, 2014; Al-Mustapha & Hamza, 2016; Atilola, Kamarudin, Achu, & Ibisola, 2016).

The causes of valuation variance has been an issue of discussion in the academia, among professionals and the judiciary, particularly in the developed world such as the UK and Australia. There have been many cases on this subject matter. The case of Singer and Friedlander Ltd. v John D. Wood and Co. provides some insights into the nature of valuation and why there is variation in property valuation. Part of the judgement of Watkins J. presented in Crosby's (2000) study reads as follows:

> *The valuation of land by trained, competent and careful professional men is a task which rarely, if ever, admits of precise conclusion. Often beyond certain well-founded facts so many imponderables confront the valuer that he is obliged to proceed on the basis of assumptions. Therefore, he cannot be faulted for achieving a result which does not admit to some degree of error. Thus, two able and experienced men, each confronted with the same task, might come to different conclusions without anyone being justified in saying that either of them has lacked competence and reasonable care, still less integrity, in doing his work ... Valuation is an art, not a science. Pinpoint accuracy in the result is not, therefore, to be expected by he who requests the valuation.*

From the judgement of Watkins J., it is clear that variation in valuation is inevitable and the causes of variance are: valuer training, valuer negligence, valuer integrity and valuation assumptions. The causes of variation in valuation from empirical studies revealed, among others, are valuer experience, client

influence, availability of market indices, lack of sanctions for professional negligence and misconduct, and absence of quality control (Achu, 2013; Akinjare, Iroham, & Oloke, 2013; Effiong, 2015; Adegoke, 2016; Munshifwa et al., 2016).

Valuation discrepancies have been a major issue that has provoked a congressional bill in the US; leading to two major commissions of enquiry in the UK and one commission in Australia (Babawale, 2008). The motivation for studies on property valuation variance arose from the study of Hager and Lord (1985) in the UK, which tried to establish the existence of variance, rather than investigating factors causing the variance in valuation. The works of Boyd and Irons (2002), Nasir (2006), Ayedun, Oloyede and Durodola (2012), Akinjare et al. (2013), Effiong (2015), Munshifwa et al. (2016), and Adegoke (2016) evaluated the factors influencing variance in various purposes of valuation. Apart from the study of Munshifwa et al. (2016) that identified and evaluated the factors causing variance in rateable values in Zambia, no other studies (both in the developed and developing nations) have evaluated factors influencing variance in rating valuation to the best of the researchers' knowledge. However, all the factors evaluated by Munshifwa et al. (2016) cannot be adopted and evaluated in the Nigerian context. This is due to the differences in rating laws and regulations, and valuation environment processes. Hence, there is a need to identify and evaluate such factors that are peculiar to the Nigerian valuation industry. This study, therefore, fills this observed gap in knowledge by exploring factors responsible for variance in rateable values in Nigeria.

The scope of this study is limited to Kwara State, Nigeria being one of the states in the country with a long standing history in rating valuation. This study therefore provides an answer to the question of what are the factors that significantly influenced variance in rateable values?

FACTORS CAUSING VARIANCE IN PROPERTY VALUATION

From the study of Harvard (2001) in the UK on valuation variance and valuer behaviour, it was revealed that the causes of valuation variance include inexperience of the valuer, understanding of comparable evidence, difference of opinion between valuers, error in the survey, procedural errors, client influence, different valuation methodologies, insufficient depth of investigation and quality control. Boyd and Irons (2002) conducted a study on the variance that existed between five valuers in mortgage valuation on the popular Meyer Centre case in Australia. The study investigated the causes of the variance by evaluating the decision of the Queensland Supreme Court on this matter. Arising from the pronouncement of the Court, wrong valuation methodology, incorrect valuation data, and value analysis were the causes of variation in the Meyer Centre case. The causes of valuation variation in Meyer Centre case could be summarised as an act of negligence.

Nasir (2006) carried out a study on valuation variation in commercial properties in Malaysia. It was revealed from the study that the variance that existed was below the ±10% stipulated by the Board of Valuers, Appraisers and Estate Agent, Malaysia (BOVAEA). The study submitted that the imposition of sanctions by BOVAEA for valuation variation of more than ±10% might have resulted in the low level of variation that was obtained in the study area.

The investigation carried out by Akinjare et al. (2013) on the causes of valuation variance in Lagos is one of the recent studies in Nigeria that tried to trace the root cause of variation in valuation. One hundred and thirty questionnaires were administered on valuation firms and was analysed using RII. The authors categorised the factors into endogenous and exogenous variables. Each factor had four variables. The four key factors that influence variation based on the RII result are: use of different input variables, use of a different method of valuation for the endogenous variable, while lack of adequate market information and client influence was identified as the exogenous variables.

The study of Ayedun et al. (2012) in Lagos and Effiong (2015) in Calaba and Uyo, all located in Nigeria, focused on causes of variance and inaccuracies in non-statutory valuations. The findings from Ayedun et al. (2012) suggested that educational background and availability of market information are the prominent causes. While that of Effiong (2015) revealed that lack of standard, lack of market comparable data, lack of regulatory framework, methods adopted, client influence, inadequate training, imperfect knowledge of property market, assumption on cost per square meter, lack of experience and failure to discipline valuers on negligence matters were the causes. Another study that investigated the causes of valuation variance and valuation inaccuracy in non-statutory valuation in Nigeria was by Adegoke (2016). One hundred and sixty three questionnaires were used for collecting the data from estate surveying and valuation firms and RII was used for the analysis. The RII results show that the causes of variance and inaccuracy in valuation are valuer skill, valuer judgement, valuer experience and problems of relevant data with an RII of 0.922, 0.921, 0.908 and 0.890 respectively.

A recent study by Munshifwa et al. (2016) applied ‘mental models’ to assess how valuers in Zambia interpret the Rating Act on the definition of ‘rateable value’ and ‘market price’. Questionnaires were administered to 18 valuers in the public and private sectors. The study revealed that absence of a centralised market (15%), lack of comparable information (15%), differences in comparable (12%) and calculation/measurement errors (8%) as the principal causes of rating valuation variance. While factors such as negligence, lack of experience, too much assumption, adoption of difference in valuation method, corruption and market stability accounted for 5% of the cause of valuation variance. The factors that did not seem to be significant were lack of market transparency, absence of consultation amongst assessors, lack of information

sharing amongst appraisers, time difference between valuation dates and ambiguity in valuation instruction. These factors accounted for 2% of the cause of valuation variance. Whereas factors such as misapplication of the rating Act, insufficient market research and overwhelming workload had a low response rate of 3% of the cause.

Furthermore, another study of variance in rateable values is by Kelly and Musunu (2000). The researchers evaluated the 1993 rating assessment that was carried out in the local authorities in the city of Dar es Salaam, Tanzania. It was concluded that lack of quality control and sanctions for wrong assessment could be attributed to the lapses observed in the 1993 assessment. Other studies that have commented on the likely causes of variance in property tax assessment are by Babawale and Nubi (2011), Oni and Ajayi (2011), Atilola (2013) and Babawale (2013). These authors attributed the causes of variance in rateable values to non-robustness of the law in terms of its comprehensiveness and explicitness. For instance, Oni and Ajayi (2011) suggested that the discretionary provisions on the assessment of property under the Land Use Charge Law of Lagos State of 2001 resulted in wide variances between assessed values and the objector values.

From the review of relevant studies on valuation variance, it can be concluded that the aspect of rating valuation has not been explored in Nigeria as most of the earlier studies focused on valuation inaccuracy relating to non-statutory valuations in Nigeria. In addition, the contributions of Babawale and Nubi (2011), Atilola (2013) and Babawale (2013) were not on property rating law but on other property taxes in Nigeria.

In order to identify factors causing variance in rateable values, the literature on variance in valuation as a whole was explored since there is little research on this phenomenon in rating valuation to the best of the researchers' knowledge. From the review of the literature on the causes of variance in valuation, 13 factors were identified. The 13 factors were grouped into three as valuer characteristics, the legal factors and the valuation environment and process factors, as follows:

a. Valuer characteristics: experience in rating valuation, unrealistic valuation assumption, integrity of the valuer, valuer negligence, training in rating valuation, professional qualification and academic qualification;
b. Legal factors: comprehensiveness of the law and explicitness of the law; and
c. Valuation environment and process factors: availability of market indices for input variables, client influence, availability market indices for input variables and quality control.

METHODOLOGY

The target population for this study is informed by the legal provision in Nigeria, which specifies that only valuers that could comment on issues of property valuation (Estate Surveyors and Valuers Registration Act 2007; Adegoke 2016). For this reason the valuers in Nigeria were the target population of this study. There were 1,149 Registered Valuers as at December 31, 2015 as indicated in Estate Surveyors and Valuers Registration Board of Nigeria [ESVABON], (2014). Out of the 1,149 valuers in Nigeria, only 33 reside in Kwara State (NIESV Kwara State Branch, 2015). The 33 valuers represented the sample frame and this was adopted as the sample size because the sample frame was small.

The data was collected through a survey questionnaire that was self-administered on the 33 Registered Valuers. Out of the 33 questionnaires that were administered, 19 were retrieved and were valid for the analysis. This indicates 57.8% response rate. According to Arowosegbe and Muhamed (2015), a 20 to 30% response rate is common in survey questionnaires. The validity of the instrument was based on expert validity advocated by Creswell (2014). The reliability of the data was based on Cronbach's Alpha. The Cronbach's Alpha of 0.685 was obtained, and according to Hair, Black, Babin, Anderson and Tatham (1998), is acceptable when the sample size is small.

The questionnaires consisted of closed-ended questions with five options based on the Likert scale of extremely influential (5) to not at all influential (1). Relative importance index, which is often abbreviated as RII, is a statistical method to determine ranking of different causes (Salleh 2009). The information gathered from the survey questionnaire was analysed with RII, which is often expressed as:

$$RII = \sum W/AN$$

Where 'W' is the weight specified to each variable by the respondents, this ranges from 5 to 1; 'A' the highest weight (that is 5); 'N' the aggregate respondents. Higher scores indicate higher perceived significant of the respective factors.

DATA PRESENTATION AND ANALYSIS

The RII result from the analysis is presented in Table 1. In order to identify the factors that have significant contributions, the result was subjected to further evaluation based on a decision rule in Table 2.

Table 1: Relative importance index of factors causing variance in rateable values

Factors Causing Valuation Variance	**5**	**4**	**3**	**2**	**1**	**Sum**	**RII**
Valuer Characteristic Factors							
Experience in Rating Valuation	17	2	-	-	-	93	0.979
Unrealistic Valuation Assumption	12	7	-	-	-	88	0.926
Integrity of the Valuer	5	7	6	1	-	83	0.874

Valuer Negligence	7	11	1	-	-	82	0.863
Training in Rating Valuation	8	8	3	-	-	81	0.853
Professional Qualification	1	11	7	-	-	70	0.737
Academic Qualification	-	12	7	-	-	69	0.726
Legal Factors							
Comprehensiveness of the Rating Law	17	2	-	-	-	93	0.979
Explicitness of the Rating Law	11	7	1	-	-	86	0.905
Valuation Environment and Process Factors							
Market Indices for the Input Variables	12	7	-	-	-	88	0.926
Absence of Quality Control	8	8	3	-	-	81	0.853
Client Influence	5	2	7	4	1	63	0.663
Absence of Professional Sanctions for Negligence and Misconduct	-	4	14	1	-	60	0.632

Source: Field survey (2016)

In setting the decision rule for identifying factors that contribute significantly to variance in rateable values, the RII figure was classified into two groups of 'accept' and 'reject' as shown in Table 2. In this analysis, the highest RII was 0.979 and the lowest was 0.632. The range of the RII was 0.347 (0.979 to 0.632). When 0.347 was divided by 5, the result was 0.0694. For each scale of index, 0.0694 was added starting from the lowest RII score. The decision rule was that only those where the RII score fell within the very significant and the extremely significant were considered to contribute significantly to variance in rateable values. This type of decision rule was used by Ismail, Bujang, Jiram, Zarin and Jaafar (2015). The result of the application of RII decision rule of Table 2 to Table 1 is presented in Table 3.

Table 2: Relative importance index decision rule

Scale of Index	Range of Index	Decision Rule
Not at all Significant	0.632 to 0.701	Reject
Slightly Significant	0.702 to 0.771	Reject
Somewhat Significant	0.772 to 0.840	Reject
Very Significant	0.841 to 0.910	Accept
Extremely Significant	0.911 to 0.979	Accept

Source: Field survey (2016)

From Table 3, it was revealed that factors such as experience in rating valuation, comprehensiveness of the rating law, unrealistic assumption, market indices for the input variables and explicitness of the rating law were extremely significant causes of variance in rateable value by falling within RII range index of 0.911 to 0.979. Furthermore, integrity of the valuer, valuer negligence, absence

of quality control and training in rating valuation were very significant having fallen within the RII range index of 0.841 to 0.910. However, none of the factors were somewhat significant, as none fell within the RII range index of 0.772 to 0.840. Nevertheless, factors such as professional qualification and academic qualification were within the RII range index of 0.702 to 0.771 making them slightly significant. Client influence and absence of professional sanctions were not at all significant, being in the range of 0.632 to 0.701.

Table 3: Significant factors causing variance in rateable values

Scale	RII Range Index	Factors Causing Valuation Variance	RII Score
Extremely Significant	0.911 to 0.979	Experience in rating valuation	0.979
		Comprehensiveness of the rating law	0.979
		Unrealistic valuation assumption	0.926
		Market indices for the input variables	0.926
		explicitness of the rating law	0.926
Very Significant	0.841 to 0.910	Integrity of the valuer	0.863
		Valuer negligence	0.863
		Absence of quality control	0.853
		Training in rating valuation	0.853
Somewhat significant	0.772 to 0.840	-	-
Slightly significant	0.702 to 0.771	Professional qualification	0.737
		Academic qualification	0.726
Not at all significant	0.632 to 0.701	Clients' influence	0.663
		Absence of professional sanctions for negligence and misconduct	0.632

Source: Field survey (2016)

DISCUSSION

From the data analysis it was revealed that the factors that could contribute significantly to the causes of variance in rateable values are nine in number. These factors satisfied the decision rule set for the determination of significant factors. These factors need to be considered when rating valuation is to be carried out. Wide variance in valuation has the following implication: the essence of valuation for whatever purpose would not be achieved, the image of the profession of estate surveying and valuation could be in disrepute and the professional could be liable for a negligent act (Babawale, 2008; Al-Mustapha & Hamza, 2016; Atilola et al., 2016; Munshifwa et al., 2016).

Some of the factors identified in this study had been identified in previous studies in developed nations such as the UK and Australia (Bretten & Wyatt, 2001; Harvard, 2001; Boyd & Irons, 2002; Bond & Brown, 2017). The factors have also been identified in the emerging property markets of Malaysia, Zambia

and Tanzania (Kelly & Musunu, 2000; Nasir, 2006; Achu, 2013; Munshifwa et al., 2016). Moreover, the factors identified in this study are in agreement with some of the factors identified in studies such as Akinjare et al. (2013), Babawale (2013), Atilola (2013), Effiong (2015) and Adegoke (2016) in Nigeria on other purposes of valuation.

The factors that were identified in literature but are not significant in this study are academic qualification, professional qualification, client influence and absence of professional sanctions for negligence and misconduct. Ayedun et al. (2012) earlier identified academic qualification of the valuer as one of the causes of variance in valuation. In the same manner, the study by Adegoke (2016) concluded that variance in valuation is traceable to valuer professional qualifications. The reason for disconfirming of these two sub-factors under the valuer characteristics could be due to the fact that the earlier studies that identified them did not directly focus on rating valuation.

Furthermore, client influence as a factor was identified as a potential cause of variance in mortgage valuation by Boyd and Irons (2002) in the popular Meyer Centre case and in some other non-statutory valuation studies such as Harvard (2001), and Bretten and Wyatt (2001) in the UK; also Ayedun et al. (2012), Akinjare et al. (2013), Effiong (2015), and Adegoke (2016) in Nigeria. However, this factor is not significant in this study. The reason for this divergent result might be that rating valuation involves some form of cross-checking during the display of the valuation list. The process in the display of the valuation list would have prevented client influence. It is therefore not a coincidence that previous studies that had either made comments of property assessment such as Oni and Ajayi (2011), Babawale and Nubi (2011), Atilola (2013) and Babawale (2013). The study by Munshifwa et al. (2016) was an empirical study on the factors causing variance in rateable values and did not mention or identify client influence as a significant factor. In addition, it could be because these studies covered both valuation inaccuracy and valuation variance.

Finally, the absence of professional sanctions was identified as one of the factors that causes variance in rating valuation in Tanzania as reported by Kelly and Musunu (2000). It is surprising that the absence of professional sanctions for negligence and misconduct has no significant influence on variance in rateable values in this study. Sanctions are a medium of cautioning erring members of the estate surveying and valuation profession on all their professional engagements. Even as it relates to valuation, in respect to the purpose of valuation, sanctions ought to be in place. Nevertheless, one may conclude that professional sanctions are not significant in this study because the motive behind objection and appeal is to have a fair rateable value. The contrary is obtainable in the non-statutory valuation, in particular mortgage valuation. In most non-statutory valuations, the intent of establishing variance is to claim damages and possibly instituting

negligence charges against the valuers as in the Meyer Centre case (Boyd & Irons, 2002).

CONCLUSION

In conclusion, this study has provided information on the factors that could cause variance in property assessment. In order for valuation to be relevant in rating administration, the identified causes of variance in rateable values must be given the utmost attention it deserves in any rating valuation exercise. Hence, this would guarantee the future existence of the profession of estate surveying and valuation through greater client confidence and patronage.

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COMMUNITY RESILIENCE FRAMEWORKS FOR BUILDING DISASTER RESILIENT COMMUNITY IN MALAYSIA

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Abstract

Disasters cannot be prevented fully but their impacts and severity can be lessened through the application of certain frameworks. However, there is currently a lack of a robust framework in building disaster resilient and sustainable communities in Malaysia. Malaysians are increasingly finding themselves not being spared from disasters especially flood. In order to keep pace with these occurring disasters in Malaysia, Community Resilience Frameworks are the backbone strategies among various stakeholders and can assure non-futile efforts for building safer and more resilient communities. Community Resilience Framework sets out the drivers, existing good practices, scopes, aims and work streams respectively for a long-term programme designed to increase the disaster resilience of communities. This paper reviews the existence of disaster resilient communities in detail. Some Community Resilience Frameworks in the context of natural disasters in Malaysia are also discussed. In this paper, literature is used as a foundation for a new insight. Document analysis method on relevant policies and literatures was adopted. It is envisaged that the findings of this study could be useful for building disaster resilient community and also closing the gaps in disaster risk reduction in Malaysia.

***Keywords*:** resilient community, community resilience frameworks

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INTRODUCTION

The incidence of natural disasters has risen very sharply worldwide, making the risk of disasters a global concern. According to the International Federation of Red Cross and Red Crescent Societies, or IFRC, (2016), disasters killed a total of 390,054 Asians during the years 2006 to 2015. In Malaysia, present efforts to mitigate impacts of disaster by national and local governments are only focused on the 'loss reduction model'. This merely attempts to prevent damage while still allowing communities to remain vulnerable to natural disaster (Bhandari, Norio, Yokomatsu, & Ikeo, 2010). It is widely observed that we are still centered on 'loss reduction' attempts to simply prevent damage rather than focusing on forming more strategic resilience frameworks to build stronger communities. Faced with such problems, forming a strategic community resilience framework in Malaysia to examine the issue of disaster management in a new perspective needs to be understood and identified with the aim to achieve common community resilience. A solid Community Resilience Framework can serve as a basis for guiding the assessment of community resilience on the ground. Therefore, this paper attempts to analyse and review the existing frameworks on community resilience which have been used to build the resilience of communities prone to disaster in Malaysia. The findings of this study also provide valuable information on the way forward in building a disaster resilient community in Malaysia by developing a comprehensive Community Resilience Framework that covers all aspects of disaster risk reduction (DRR).

WHAT IS A COMMUNITY?

From the start, the government is the primary and most important facilitator of resilience. However, community also comprises parts of greater wholes (states, regions and nations) as well as a suitable level for building resilience (Longstaff, Armstrong, Perrin, Parker, & Hidek, 2010). According to IFRC (2014), community refers to a group of people who may or may not live within the same area but share a similar physical environment, services and resources. One of the significant reasons to focus on resilience at the community level is because communities are at the centre of everything we do. Community itself plays an outstanding role in increasing resilience and is also the actual first responder to any disaster.

Community involvement is crucial in order to understand the needs of others, ensuring their safety and strengthening their resilience. According to Becker et al. (2011), a number of community attributes can be used as indicators of resilience where they are grouped into three areas including: (1) Making a Difference, where people need to know that the small things they do can make a big difference for themselves, their families and neighbours; (2) Participation and Empowerment, where direct involvement of communities can help in identifying the disaster risks and figuring out the resolutions for themselves; and (3)

Leadership and Trust, where communities are supported by organizations who encourage community-led initiatives and where mutual trust and respect exist.

Moreover, most disasters are local in nature and affect different communities in differently. Thus, we can say that each community is unique as they have their own local ideas about prevention, protection, response, and recovery gained from different types of disasters (Emergency Management Victoria, 2017).

RESILIENT COMMUNITY IN THE CONTEXT OF DISASTERS

Community Resilience has been linked with disaster in many studies conducted earlier. However, it may not be associated with disasters in Malaysia as severe natural disaster does not regularly occur in Malaysia. In the 1980's, Timmerman (as cited by Gonsalves & Mohan, 2012) was probably the first researcher to use the concept of resilience in relation to disasters. Most authors use the term 'ability' to define the concept of disaster resilience and linked the concept to people, a group of people or a community's ability to absorb stress and recover from the disaster. This generally means that, the concept of disaster resilience should be associated with that of community.

Community Resilience in the Context of International Level and Publications Found in the Search

Since Community Resilience may not be associated with disaster in Malaysia (as severe natural disasters do not regularly occur in Malaysia), therefore, the definition of "Community Resilience" is defined based on the international context. According to IFRC (2014), Community Resilience means the ability of communities when exposed to disasters to anticipate, prepare for, reduce the impact of coping with, and recovering from the effects of shock and stresses without compromising their long-term prospects. Meanwhile, Community and Regional Resilience Institute, or CARRI, (2013) stated that Community Resilience is more likely means the ability and capability to anticipate risk, limits impact, and 'bounce back' rapidly through survival, adaptability, evolution, and growth in the face of turbulent change. Pfefferbaum, Pfefferbaum and Van Horn (2011) explained that Community Resilience is the ability to transform the environment through deliberate, collective action and requiring that the community as a whole must cope effectively with and learn from adversity. In the meantime, United Nations International Strategy for Disaster Reduction, or UNISDR, (2005) defined Community Resilience as the ability of a system, community or society potentially exposed to hazards to adapt, resist, accommodate or recover and change from the effects of a hazard in a timely and efficiently manner, in order to reach and maintain an acceptable level of functioning and structure.

Building Disaster Resilient Community in Malaysia

According to Sobian (2016), 'community' can be defined in the Malaysian context as: a *kariah masjid* (a group of people who share or live in the area around a mosque); people living in a village; members of fishermen associations; residents' associations; and religious-based organisations. Such units of community generally know each other, carry out their own activities and are ready to assist each other in any situation (Sobian, 2016).

The National Progress Report on the Implementation of the HFA (2011-2013) states that limitations in budget, time, human input, capacity and tools reduce the level of participation of community in building disaster resilience. Hence, it is difficult to encourage the public in Malaysia to take action to reduce risks and build disaster resilient community. The government has organized several awareness programmes on disaster risk reduction including the National Disaster Awareness Day (held annually on 26 December), Safe School Programmes, establishing several funds such as Poor Student's Funds and the National Relief Fund in 2006 in order to help disaster victims. In contrast, most of the information on disasters is often conveyed through television, radio, and the print media to educate the community on disasters; to build a disaster resilient community in Malaysia.

METHODOLOGY

Understanding the disaster resilient community concept and synthesizing community resilience frameworks in Malaysia requires a systematic procedure for reviewing or deriving useful information from the existing documents, both printed and electronic materials. For the purpose of this paper, a document analysis method was used to kindle the meaning, gain understanding, and develop empirical knowledge.

In order to synthesize community resilience frameworks in Malaysia, the National Security Council (NSC) Directive 20, the Eleventh Malaysia Plan (2016-2020), downloaded documents from MERCY Malaysia website and other related literatures were studied. The results were then crossed with Hyogo Framework for Action 2005-2015 (HFA) and Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) to identify compliance with international frameworks.

SYNTHESIZING COMMUNITY RESILIENCE FRAMEWORKS IN MALAYSIA

Community Resilience Framework provides a methodology and supporting detail to help communities understand their social community and built environment (National Institute of Standards and Technology, 2015). Framework is about ensuring that everything involved in disaster management in Malaysia helps in turn to build a safer and more resilient Malaysia. Malaysia has been exposed to

disasters ever since Independence Day in 1957. Even after several decades of scientific research advancement, we are still threatened by the rising rate of the devastating impact of natural disasters. Nevertheless, there has never been any specific resilience framework for Malaysia; but only the existing disaster management policies and plans for disaster resilience.

Malaysia is strongly committed to the Hyogo Framework for Action (HFA) programme to build the resilience of its nation (Badi, 2017). In 2005, the government implemented this Framework through the existing National Security Council (NSC) Directive No. 20 (Mohamad Amin & Hashim, 2014). Therefore, the Standard Operating Procedure (SOP) for the management of disaster is the NSC Directive 20. Since Malaysia is one of the countries that rectify the International Framework for DRR and it does not have a separate Community Resilience Framework, NSC Directive 20 can be considered as the framework that intends to make our country safe and resilient. In the next section, the legal disaster management policies, frameworks, plans and programmes for disaster resilience are discussed.

Hyogo Framework for Action 2005-2015

In 2005, Malaysia was among 168 countries which signed The Hyogo Framework for Action 2005-2015 (HFA) and has implemented this Framework for Action through the existing National Security Council, Directive No. 20. There are two aims of HFA, which are to reduce vulnerabilities and to reduce risk to hazards. HFA not only focuses on risk reduction but also focuses on community participation in any DRR programmes. According to HFA, community participation can be promoted through the adoption of specific policies, the promotion of networking, the strategic management of volunteer resources, the attribution of roles and responsibilities, and the delegation and provision of the necessary authority and resources (UNISDR, 2005). Accordingly, these are some of the reasons why Malaysia needs to have a comprehensive Community Resilience Framework that can improve multi-agencies and community preparedness towards disasters and contribute to the achievement in building resilient community in these events.

Sendai Framework for Disaster Risk Reduction 2015-2030

The Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) was adopted by United Nation Member States on 18 March 2015 at the Third UN World Conference in Sendai, Japan. It attracted a high level of political interest, which can be partly explained by the current converging dynamic between DRR, the Sustainable Development Goals and Climate Change issues (UNISDR, 2015).

SFDRR has clearer objectives to be achieved in the DRR efforts including the engagement of community in DRR. This framework provides feedback to the community, and is focused on attaining DRR and building

disaster resilience in Malaysia. In support of Target (e) of the SFDRR, it is important for Malaysia to develop a Community Resilience Framework as this will foster an integrated approach to community resilience and disaster risk reduction. It will also promote support of DRR governance through enhanced interactions between communities, local and national levels.

National Security Council Directive 20

In Malaysia, the National Security Council (NSC) Directive 20: The Policy & Mechanism for National Disaster Management Policy is the main policy guideline and overall disaster risk governance mechanism. The NSC Directive 20 is the key 'framework' for disaster management in Malaysia. It contains directives related to relief and management of natural and technological disasters. The policy statement for disaster relief operations in Directive 20 is aimed at, specifically: mitigation (to mitigate the effects of various hazards); preparation (prepare for measures that will reduce loss of life and damage to the environment); response (ability to respond and provide assistance during disasters) and recovery (establish a recovery system to ensure the affected community's return to the pre-disaster situation). Until now, all the efforts to deal with disaster in Malaysia have proceeded as usual in accordance with NSC Directive 20.

NSC Directive No. 20 (1997) prescribed the mechanism on management of disasters whereby the roles and responsibilities of the various agencies involved in handling disasters are identified. In regard this, NSC had established the National Disaster Management and Relief Committee (NDMRC) with the major aim of coordinating disasters according to the three different levels, namely: Federal (disasters are managed by National Disaster Management and Relief Committee (NDMRC)), States (disasters are managed by the State Disaster Management and Relief Committee (SDMRC)) and Districts (disasters are managed by the District Disaster Management and Relief Committee (DDMRC)).

Through NSC Directive 20, the government hopes that the handling and resolution of disasters can be carried out in a more corresponding manner with the integrated involvement and mobilization of multi-agencies in order to minimize the suffering and losses as a result of disasters. However, NSC Directive 20 has been outdated since the development of HFA and SFDRR. Therefore, it should be reviewed in order to create and include a new national policy related to DRR to address the involvement of community in disaster management in Malaysia.

Building Resilience Community Programmes by MERCY Malaysia

In achieving community resilience, MERCY Malaysia has developed and introduced Building Resilient Communities (BRC) to engage various

stakeholders in addressing and responding to issues, ideas and actions that will help in enhancing the level of community resiliency (MERCY, 2016). MERCY (2016) revealed that BRC is a holistic approach that includes all levels of stakeholders in a community. It is aimed to increase capacity and capability by identifying and reducing vulnerability with the objective of building the community's resilience in social well-being and equity, environmental stewardship, as well as economic prosperity and continuity respectively. For the DRR project to achieve meaningful goals, MERCY has undertaken training programmes through the BRC modules including, namely: Local Government Units (LGUs) (educate, train and strengthen relevant LGU stakeholders on DRR and disaster risk management (DRM)); Community Based Disaster Risk Management (CBDRM) (provide a platform for communities to actively participate in DRR activities, gain knowledge, skills and competencies in DRR, as well as enhance and use indigenous early warning systems); School Preparedness Program (SPP) (generate a culture of disaster awareness and response amongst school children, teachers and staff); Resilient Health Infrastructure (RHI) (increase and introduce hospitals and their management to DRR and to improve the hospital's disaster preparedness and early warning systems through the implementation of DRM); and Private Sector (PS) (engage and work collaboratively with private and corporate sectors in the development and implementation of DRR and DRM programmes).

The Eleventh Malaysia Plan (2016-2020)

The Eleventh Malaysia Plan (2016-2020) continues to reinforce the resilience of the nation to natural disasters. In relation to the Eleventh Malaysia Plan, four focus areas are proposed which will lead to significant changes in Malaysia's approach to pursuing green growth for resilience. However, our discussion is more related to disaster resilience, hence only Focus Area D: Strengthening Resilience against Climate Change and Natural Disasters will be further explained in this paper. The following strategies will be undertaken to reach these objectives:

(i) Strategy D1:

This aims to strengthen DRM by establishing a policy and institutional framework, as well as by improving disaster detection and response capacity. This will be improved by: upgrading detection technology and forecasting systems; in addition to incorporating DRM into development plans and creating community awareness among the Local communities, civil society organizations and the private sector.

(ii) Strategy D2:

This seeks to improve flood mitigation measures by generating new investments from flood mitigation projects (the Department of Irrigation and Drainage Malaysia (DID) will use another new technology to mitigate floods and encourage investment) in order to enhance long-term planning (DID and other relevant agencies will implement Integrated Water Resource Management, Integrated River Basin Management and Integrated Flood Management) and strengthen flood forecasting and warning systems; and

(iii) Strategy D3:

This aims to enhance climate change adaptation by developing a national adaptation plan and strengthen resilience of infrastructure, natural buffers including the water and agriculture sector as well as creating awareness on health impacts.

Faith-Based Organisations as Pillar of Community Resilience

In Malaysia, it is important to highlight the role of faith in both individual and community life. Faith-Based Organisations (FBOs) in the Malaysian context refer to all faith-based non-governmental organisations (NGOs) or any religious communities that base their activities on their beliefs or places of worship (Sobian, 2016). In pursuit of optimal disaster risk prevention, reduction and resilience, FBO which work closely within local communities can use their unique strength to facilitate resilience in responding to concerns arising from disasters.

FBOs are amongst the first to respond to the needs of disaster victims and offering help and support in spiritual and psychological dimensions to disaster survivors. Due to the above reasons, FBOs could be considered as a strong pillar of community resilience in Malaysia. It is essential to keep them focused on disaster management activities and actively engaged them in community resilience building initiatives (Wijesekara, 2017). Therefore, FBOs are important and they have proven to be the focus of community resilience in Malaysia. In order to function effectively, they need adequate support from all stakeholders (including the government and the private sector) in building safer and more resilient communities to with stand disasters in Malaysia (Sobian, 2016).

CONCLUSION

In conclusion, increasing disaster resilience involves a focus on the strength and sustainability of a community's lifelines, as well as strengthening the relations between people, services, systems and structures that support the community to function. Bringing this together, the framework provides an integrated approach to resilience**.** Community Resilient Framework (CRF) is most important as it helps the community to understand their social community and built environment

and assists them to learn to link the community's social institutions with the built environment. All the policies, frameworks, plans and programmes in Malaysia as mentioned above can be used for enhancing community awareness, preparedness and handling during and after the disaster. However, most of these policies, frameworks, plans and programmes designed to measure disaster resilience tend to focus only on some of the aspects and do not adequately take a broader view of the concept. Definitely, it is important to propose a CRF that could add values, role and institutions involved and the linkages between planning system, DRR initiatives and disaster resilient community respectively. Therefore, it is important that the future research not only focus on purely single aspects but also on the broader view of the concept in building a disaster resilient community in Malaysia.

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ONE STOP CENTRE (OSC): LESSONS ON BEST PRACTICES IN PLANNING SYSTEM DELIVERY

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Abstract

Malaysia has been experiencing rapid development since its independence in 1957, which has transformed its economic base from agriculture to industry. Rapid urbanisation has, itself, led to the continued rise of economic growth, and an acceleration of neoliberal market values. In turn, these have (re)shaped Malaysia's planning system. Certainly, planning systems have a role in contributing, often directly, to the country's needs and aspirations, particularly in the decision-making process. This effort is evidenced by the improvement of the planning system's delivery mechanism, known as One Stop Centre (OSC). The OSC was initiated by the Ministry of Urban Wellbeing, Housing and Local Government on the 13th of April, 2007 to improve the planning system delivery and procedures at all local planning authorities by coordinating and shortening the approval process. However, relatively little is known about the effectiveness of OSC in the property development sector. Hence, this paper presents a synthesis of results on the effectiveness of OSC in other countries, with the objective of developing an understanding of how OSC rationalizes the success of the property development sector through its policies and planning practices. The knowledge of these theoretical situations serves as a basis for future strategic planning decisions, and as a guide in the planning system delivery of real estate development, particularly in the Malaysian context.

Keywords: decision-making, planning, delivery system, One Stop Centre, development

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INTRODUCTION

By 2030, an estimated one in every three people from 60% of the world's population will live in cities with at least 1 million inhabitants (United Nations, n.d.). An understanding of this increasing urbanisation is critical as the physical form of the urban environment poses massive sustainability challenges. The Sustainable Development Goals have given new impetus to improve city development, as stated in Goal 16: to "develop effective, accountable, and transparent institutions at all levels," and to "ensure responsive, inclusive, participatory, and representative decision-making at all levels" (United Nations, n.d.). In this sense, the planning system delivery must be made even more efficient and effective to promote sustainable development, particularly by local authorities.

The success of a development project as a whole is crucial to all the stakeholders, who primarily are the developer, the land owner, and property buyer. The timely completion of a project that is not only within the budget, but also in accordance to specifications and the stakeholder's satisfaction, benefits both the project owner (developer), and the property buyer (Nguyen, Ogunlana, & Lan, 2004). Every project development will undergo some form of a project life cycle (PLC) (Kerzner, 2009). If procedures are too complicated or costly, developers tend to proceed with development without a permit (Moullier, 2009). In fact, it is estimated that 60% to 80% of building projects in developing economies are undertaken without proper permits and approvals (Hernando, 2000).

Furthermore, time and procedures are the biggest "regulatory impediments" to rationalizing the success of the property development sector. Time taken by authorities, especially for the issuance of design approval, is uncertain, and difficult to predict (Kincaid, 2003). Similarly, a case study carried out by Mitropoulos and Howell (2002) found that the main reason for the delay in development projects was the process of getting approval from local authorities. When delays occur, the overall cost for the project would also be affected. McKim, Tarek and Attala (2000) mentioned that one of the factors contributing to cost and schedule overruns is the regulatory requirements. In some cases, the plans and drawings had to be submitted more than once due to amendments that need to be complied with. This is sometimes due to the complexity of the requirements set by the respective authorities (ibid.).

Accordingly, the local authorities are also the local planning authorities for their administrative areas (Town and Country Planning Act 1976). The functions of local authorities are expanding to various roles, which include development planning and control, and particularly, planning system delivery (ibid.). As questioned by Rashid (2012): "How can local authorities become an effective machinery to facilitate national growth, and enhance the nation's competitive edge?" In this sense, it becomes important for the local authority to

ensure an effective decision-making process, particularly in land development "for better improvement to generate and assist the property market institution" (Ahmad, Ahmad, & Arbi, 2011).

The federal government of Malaysia understands the need to speed up and standardise design approval procedures; therefore, it has introduced the One Stop Centre framework on April 13, 2007, to help expedite approval of construction permits (PEMUDAH, 2010). It also provides local authorities in Malaysia the common design approval procedures for new development applications. This effort is evidenced by the improvement of the delivery mechanism, known as One Stop Centre (OSC).

RESEARCH BACKGROUND

The planning system in Malaysia adopts a 'top-down' approach, starting at the federal level, then at the state level, and finally at the local authority level (Abdullah, Harun, & Rahman, 2011). There are three types of local authorities in Malaysia: the city council, the municipal council, and the district council. Accordingly, "the local authorities, or the government carries out obligatory, discretionary services, and are the agents of development, whose function is to provide services that are non-profit-making to the people, including various other mandatory services" (Maidin, 2012). In relation to town and country planning, the local authority functions as the local planning authority whose responsibility is to "regulate, control, and plan the development and use of all lands and buildings within its area" (section 6(1)(a), Town and Country Planning Act 1976). The local planning authority has the power to execute town and country planning functions as outlined in local plans (Omar & Leh, 2009). More importantly, the local planning authority must play a more effective role to ensure sustainable development by managing the urban system, and its environment.

In essence, the OSC was initiated by the Ministry of Housing and Local Government (MHLG) in April 2007 to improve the planning system delivery and procedures at all local planning authorities by coordinating and shortening the approval process. The procedure includes applications for planning permission, building plan approval, land conversion, subdivision, and amalgamation (Ministry of Housing and Local Government, 2008). Significantly, the actual planning consent decision-making process in Malaysia is decided by the planning approval committee at the local authorities where the OSC is positioned.

Moreover, the purpose of the OSC is to improve the planning system in its delivery, and contribute towards property development in Malaysia. However, relatively little is known about the effectiveness of OSC in the property development sector. This is despite the fact that development in Malaysia is aimed at promoting economic development (Watson, 2013). In this sense, this paper presents a synthesis of results on the effectiveness of OSC in other countries, i.e. Singapore, and New Zealand, with the objective of developing an

understanding of how OSC rationalizes the success of the property development sector through its policies and planning practices.

ONE STOP CENTRE

The government, at the Cabinet Meeting on the 25th of February, 2004, approved a proposal by the MHLG to establish OSC in all local authorities in Peninsular Malaysia (Ahmad et al., 2011). The report on OSC performance, with the improvement of delivery procedures and processes, then obtained Cabinet approval in 2007 (Ministry of Housing and Local Government, 2008). Following this, all local authorities immediately set up an OSC to manage development proposals, covering planning permission applications, building plans, land conversions, subdivisions, and amalgamations, with the main objective being to shorten the duration for approvals in the planning process. In this regard, an OSC Committee was established and authorized to consider and decide upon applications for planning permissions, building plans, and land matters. In fact, the local authority is the main agency that is responsible to administer, plan, and manage urban development. With the establishment of the OSC, it is hoped that cases of duplication, or double-loading of technical reviews during the processing of planning permission applications, building plans, and applications for land development approvals can be avoided.

Moreover, the growth in construction activities in Malaysia since the 1980's has given rise to the need for statutory controls to ensure systematic and orderly development. This process of statutory approval refers to the obtaining of permissions from the relevant authorities to initiate and construct a facility and, upon its completion, to occupy and use the completed facility. As mentioned earlier, the main functions of the OSC are to distribute and coordinate the applications for planning permission, building plan approval, and land matters (i.e. land conversions, subdivisions, and amalgamations). Therefore, the establishment of OSC is critical to shorten the approval process, and improve planning system delivery in Malaysia.

However, among the recorded 190 nations in the 2018 World Bank's annual report of Ease of Doing Business Ranking, Malaysia is currently at 24th place (from 13th spot in 2017) (The World Bank, 2018) whereas our neighbour, Singapore, takes a higher spot at 2nd place. This shows that the Malaysian planning system delivery still needs a lot of improvement to compete with other nations, particularly New Zealand (1st in World Bank rank), and Singapore (2nd in World Bank rank). In this context, this article is vital to develop an understanding of how the delivery of the planning systems in Singapore and New Zealand rationalize the success of the property development sector through their policies and planning practices. The knowledge of these theoretical situations will serve as a basis for future guidance in the planning system delivery of real estate development in Malaysia.

LESSONS ON BEST PRACTICES: SINGAPORE AND NEW ZEALAND

Singapore

Singapore is located below the southern part of Peninsular Malaysia, and covers an area of about 719.9 km^2 (Singapore Department of Statistics, 2017). It is home to a population of 5.61 million, with a population density of 7,797 per sq km in 2016 (ibid.). Singapore aims to optimise the use of the country's limited land area for the diverse needs of both current and future generations. Singapore gained its independence in 1965, and transformed its nation to a developed one in less than fifty years (Yuen, 2009). Singapore is known for its efficiency and success in managing its urban planning matters (http://global-is-asian.nus.edu.sg, 2017). The urban planning system in Singapore was formulated and legislated based on the Town and Country Planning Act 1947 in Britain, and the implementation of plans highly comply with development control and planning regulations (Yuen, 2009).

The Planning Process and Practices

Most of the development that involves construction, and change of use in Singapore requires planning permission. The land use planning is implemented according to, and complies with development control and planning regulations, which has gained international recognition as a model of good governance practice (Yuen, 2009). Control over land allocation and development is vital due to the limited land area, and the rising value of land in Singapore. The highest level of central decision-making in Singapore is the Cabinet, which was adopted from the British parliamentary system. On the other hand, the Urban Redevelopment Authority (URA) – a statutory board under the Ministry of National Development, is the national planning authority of Singapore that functions as a central planning agency to process planning and development control systems, enforcement of planning policies and standards, and development constraints.

The goal for Singapore's land use planning is "to create a sustainable Singapore that provides a quality living environment, offers plentiful growth opportunities and jobs for the people, and safeguards our clean and green landscape" by balancing economic, social, and environmental considerations (Urban Redevelopment Authority, n.d.). The development in Singapore is based on a long-term planning approach which is done in two segments: the Concept Plan (40 to 50 years' plan, reviewed every ten years), and the Master Plan (10 to 15 years' plan, reviewed every five years). The URA plays the role of preparing these long-term strategic plans, and bringing them to reality. The application for development control must refer to the Master Plan that shows all the permissible land use and density for developments which need to be read with the planning

legislation, i.e. The Planning Act Master Plan Written Statement 2014 (last revised on 15 January 2016).

The URA regulates and controls developments to ensure that the planning system delivery follows the statutory Master Plan, which includes land use, building height, and plot ratio. Here, the Concept Plan and Master Plan are of significance as they have been used to endorse the various planning applications. The Development Control department will evaluate the applications for planning permission/development work before granting approval to ensure the development will be in line with Singapore's planning strategies and guidelines. Moreover, to ensure the development is integrated well with the citizens' environmental, social, and economic wellbeing, the department holds frequent dialogues and discussions with professional bodies, and the public. According to the Planning Act, "development" means the carrying out of any building, engineering, mining, earthworks, or other operations in, on, over, or under land, or the making of any material change in the use of any building or land, and the terms "develop" and "developing" shall be construed accordingly. As such, unless specifically exempted, all development works in Singapore require planning permission approval from the URA.

The planning system delivery in Singapore is conducted via electronic submission, or also known as 'CORENET' (Construction and Real Estate Network e-Submission System). The CORENET is used to register and submit a development application for planning permission, and other applications to other relevant authorities. The development control submission checklist (submission and planning requirements) are also available in the system to serve as a guide for the Qualified Person (QP). Accordingly, the URA has produced a series of handbooks on development control, such as Development Control Parameters for Residential Development, Development Control Parameters for Non-Residential Development, and Conservation Guidelines. The Qualified Person (QP), one who can submit a development application, can check the status within 20 working days after the submission date. However, with complex cases, more time may be required to evaluate the application.

New Zealand

New Zealand is located in the Southwestern Pacific ocean, and geographically comprises two landmasses – North Island, and South Island. The total area covers about 268,021 km^2 (StatsNZ, n.d.). The population in New Zealand is estimated at 4.7 million, based on the 2013 census (ibid). In fact, New Zealand's population has the fastest growth rate in the past few years, with a 2.1% population growth in 2016 (Fyers & Flahive, 2017).

The Planning Process and Practices

In New Zealand, the application for planning permission is known as an application for resource consent, or submission of an application or council planning document (Ministry for the Environment NZ, n.d.). The Resource Management Act 1991 (RMA) is New Zealand's main legislation that outlines the processes of resource consents, council plans and designations, proposals of national significance, and the types of legislative tools issued under the RMA, among others.

According to the RMA, local authorities have to prepare plans to manage the physical environment in the local authorities' area. The plans include Regional policy statements that set the basic direction for environmental management in the region, Regional plans that concentrate on practical parts of the environment such as coasts, soil, rivers, or air, and District plans that set out the objectives, policies, and rules of local authorities in managing the use and development of the land in their area (Ministry for the Environment NZ, n.d.). For example, the Auckland Plan is used to guide Auckland's future (30 years' plan) in solving issues such as reducing transport and housing shortages, and protecting the environment, whereas the Unitary Plan is used to help Auckland meet its economic and housing needs, particularly by determining what can be built and where in the local authorities' areas.

The planning system delivery in New Zealand is conducted based on three main stages that give resource consents permission to use or develop a natural or physical resource, and carry out an activity that affects the environment. Accordingly, an application for a resource consent is made to the local authorities. In certain circumstances, resource consent applications for nationally significant projects are decided on by a board of inquiry, or the Environment Court instead of the local authorities. This process is almost similar to the Malaysian planning context, in which specific developments, as outlined under section 22(2A), shall request from the National Physical Planning Council its advice on the application submitted. The three main stages of the resource consent process are as follows:

Stage One: The applicants prepare their application

The applicant, or a resource management planning consultant, prepares an application for proposed development. Before applicants submit their application for resource consent, they may consult local authorities for written approval. The local authorities will inform the applicants what information they need to provide, how long the process of resource consent is likely to take, and the costs that will be incurred. During this stage, the local authorities will advise the applicants on making any changes to remove or reduce any adverse effects of the project development.

The applicants need to complete and submit an application form together with an assessment of environmental effects (AEE). The AEE is essential to describe all the environmental impacts of the proposed development, and the mitigation measures if the development causes any adverse effects. The information that needs to be included in an AEE and the proposed projects are outlined in the RMA, or district/regional plans. The local authorities can reject the application, and return it to the applicants within ten working days after the application was first registered if the application is incomplete. The public consultation process is not compulsory in New Zealand, but applicants can still get advice, and consult the local authorities to ensure the application process runs smoothly, and to help identify potential effects that need to be addressed (including effects on other people). In fact, by engaging in consultation or a pre-application meeting, the possibility of the application being completed and accepted for processing by the local authorities will increase.

Stage Two: The local authorities consider the application

A resource management committee will check the application for completeness. This is to make sure that the application fee, and all the required information is provided at this stage. Then, the local authorities will determine whether the application is publicly notified (to notify the general public), limited notified (to notify only affected parties), or non-notified, to give the public the opportunity to submit or object. The local authorities will decide on whether to inform the application according to:

- the scale and significance of any adverse environmental effects associated with the application;
- whether the application has obtained the written approval of any affected persons; and
- what any relevant national environmental standard and plan requires.

Then a hearing may be held if the general public or the affected parties wish to be heard. The authorities will conduct the hearing. However, the local authorities may arrange a pre-hearing meeting to clarify or resolve issues, which eliminates the need to proceed to a hearing if all the issues of concern can be addressed.

Stage Three: The decision

The authorities will consider and decide as to whether to grant or refuse the resource consent. The public and limited notified parties who lodged a submission/objection to the application will be informed of the decision. The approved application will likely be subject to certain conditions. If the applicants are not satisfied with the decision or the conditions, they can appeal to the Environment Court, which needs to be done within 15 working days of receiving the decision.

Furthermore, New Zealand uses MultiProof – an online system to submit building plans that are similar in design many times. According to the Ministry of Business, Innovation and Employability (2016), MultiProof is beneficial for those who:

- build, or intend to build a number of similar designs;
- use standard construction details for a range of similar buildings;
- want to offer customers a lower-cost option;
- want to save time when applying for a building consent;
- need consistency when applying for building consents to different Building Consent Authorities (BCAs);
- want to assure customers that the design will gain building consent; and
- can build the approved design at least 10 times in a two-year period.

The urban planning in New Zealand is an essential contributor to its economic growth, and management of environmental effects. In fact, the ways in which the planning system is processed and delivered can be used as a guide for the delivery mechanism of real estate development in the Malaysian context.

FINDINGS

Malaysia has adopted a hierarchical planning system, whereby the federal government formulates policies, but planning and implementation responsibilities rest with the state and local governments. Local governments must refer to the development plans, and consider the public's rights in their decision-making processes, including whether to approve or disapprove land development activities. Indeed, planning practice has a role in contributing, often directly, to the country's needs and aspirations, particularly in the decision-making process (Porter et al., 2013). In this sense, the local authorities are facing greater challenges due to the increasing urbanisation of the country (Ministry of Housing & Local Government, 2008).

The challenges are similar in Singapore and New Zealand, where these countries are compounded by rapid population growth due to urbanisation. Therefore, an effective and improved planning system delivery is critical in managing and responding to this pace of urbanisation. Malaysia is currently at a low ranking (24th place) compared to New Zealand (1st), and Singapore (2nd), as reported by the 2018 World Bank's annual report of Ease of Doing Business Ranking (The World Bank, 2018). This shows that there is still a long way to go for the improvement of the Malaysian planning system delivery. As such, it is important to see what is occurring in actual practice, particularly in the plans and processes that are in place in New Zealand and Singapore in managing their planning systems.

In Singapore, the plans (Concept and Master Plans) and implementation agency (URA) play a significant role in coordinating the technical departments

to ensure that the planning system delivery follows the statutory Master Plan. On the other hand, in New Zealand, the planning delivery system is underpinned by the Resource Management Act 1991. The Act requires local authorities to create plans (regional or district plans) to manage the environment, and the matters that involve resource consent application.

In Malaysia, one of the issues in planning application is the delays. Sometimes, the delays are caused by the OSC procedure itself because it involves too many officers. At the same time, the Professional Submitting Person (PSP) have also submitted application with inadequate documents that ends up dragging the application further into the delay. The delay is also caused by the OSC Department counter since the counter runs short on manpower and expertise even though the current officers at the OSC Department are capable in terms of skills and knowledge. But because of lacking in manpower, the OSC Counter is incapable of conducting most technical requirements like fee calculations, pre-consultations, and technical discussions.

According to the World Bank (2018), the pre-consultation process is crucial in dealing with development/construction application. Although pre-consultation is not compulsory in New Zealand, it is advisable for applicants to get advice, and consult the local authorities before the application of resource consent. Hence, through the pre-consultation process, the OSC will be able to answer questions from the applicants. To be able to do that, the OSC Department must be more closely involved in the development matters, rather than merely receiving and distributing the application. The OSC Department must start improving their role by deploying capable and knowledgeable officers. By having competent officers, any department, not just the OSC Department, may be able to begin mentoring new officers to help them learn a lot faster. Furthermore, the Professional Submitting Person (PSP) must be informed of the time limitation, and expected timeframe of every process. For instance, the local authority (e.g. Subang Jaya Municipal Council) does not specify in the B2 Form about the 2-day timeframe, the 7-day timeframe, the 14-day timeframe, and the 30-day timeframe, and also the timeframe needed for the PSPs to return their amended plans. In contrast, in New Zealand, its delivery system practices a clear decision timeline (statutory clock) for planning applications (Palmer, 2017).

Currently, the OSC Procedures is considered as a 'one-size-fits-all' procedure as all types of developments (housing, commercial, industrial) are processed through the same procedure. Objective-based approval will help speed up approval by identifying the application by the development type. All the technical agencies involved with development (both internal and external technical agencies) must understand the OSC procedures to help reduce any possible delay in the process. This is especially important for the external technical agencies because they deal with numerous local authorities. The PSP, or the consultant, is key to every successful application. If they do not have an

understanding of the development guidelines and regulations, one should expect instant failure. To avoid that, every PSP must be well-prepared for any submission of real estate development applications.

CONCLUSION

There is always a need for constant reform of physical development regulations, which enables technological changes to ensure better physical development control and enforcement as in Singapore (CORENET) and New Zealand (MultiProof). Perhaps, Malaysia should consider this type of system for applications that have a specific set of plans, and certain standard specifications in its planning system. Probably, every local authority should improve their server size (for data storage) accordingly. This will enable the local authority to explore new ways to improve their services, and assist the public. One example is the mailing system. With an online mailing system, any PSP might be able to receive plan reviews with a click of a button (or from a simple SMS). Although there are some similarities between the planning system delivery in Malaysia, and Singapore and New Zealand, yet, there is still a lot Malaysia can learn from both countries to rationalize the success of the property development sector, mainly through its policies and planning practices.

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POTENTIAL UTILISATION MAPPING OF STATE-OWNED ASSETS IN THE FORM OF LAND AND BUILDING LEASE IN PALANGKARAYA CITY

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[1,2]*The Directorate General of State Asset Management*
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Abstract

This paper discusses on how the Directorate General of State Assets Management (DGSAM), as the state-owned asset manager, under the Ministry of Finance of the Republic of Indonesia, analyses the best suited strategy to map public assets. The tremendous amount of assets to be managed are scattered all over Indonesian archipelago. As one of the revenue centres for the nation, DGSAM needs to have more information about the feasibility of those assets. This study addresses the mapping of potential state-owned assets and measures the potential revenue to find out how much that can be generated from them. Asset mapping was done using geographical information system analysis, while the potential value of the appraised assets is calculated using artificial neural network. The study takes place in Palangkaraya, the largest city in this country, which might be the promising capital city of Indonesia in the near future. Based on the findings, it is clear that the government assets which can be exploited in Palangkaraya alone are about 14,302 m2 of land with the potential revenue of USD 86,040/year, and 141 rooms which are predicted to generate around USD 106,342/year, with appropriate occupancy rate in the market.

***Keywords*:** asset mapping, GIS analysis, Artificial Neural Network

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INTRODUCTION

The more assets utilised, the higher the revenue will be. Indonesian government is trying to increase non-tax revenue from its assets. The Ministry of Finance of the Republic of Indonesia (MoF) has assigned Directorate General of State Assets Management (DGSAM) to be one of the revenue centres, managing state-owned assets all over the archipelago. This study focuses on the mapping of those potential assets by collecting and analysing the information database of the assets to come up with the most effective in accordance to generate revenue. The performance depends on how much revenue can be obtained and the measurement of the revenue is the key factor. As a manager, DGSAM needs to employ a device which is able to measure how many total assets to be managed and how large the potential value they have.

One of the ways to manage state assets in order to generate revenue is by utilising those assets. In Indonesia, DGSAM issued the Government Regulation Number 6 in 2006 regarding the management of state -owned assets. The use of assets by DGSAM has been expanding rapidly since then. However, the institution has to complete the appraisal in one particular region first, before moving to other places. This situation is quite reasonable because Indonesian government has remarkable number of assets with various forms, scattered all over the country and they are highly dependent on the asset users' proposals.

According to the regulation of the Minister of Finance, number: 57/PMK.06/2016, assets can be leased through a proposal from any ministries as the asset users. Then the proposal is examined and approved by DGSAM, which decides the lease by engaging the appraisers. The rates presented by a single valuer, is fair value over the rent through individual valuation. Unfortunately, due to the astounding number of the government assets, it takes a long time to produce the fair value. 'Pricing a product is one of the most important decisions an organization can make' (Lipovetsky, Magnan, & Polzi, 2011, p. 1). If the price of a product is too low, it is less likely to generate profit, but if it is too high, the potential customer might walk away.

There are two major challenges to address by DGSAM in this situation; how to determine assets that can be utilized and how to determine the value of the assets effectively. DGSAM should adopt knowledge discovery in database system to support efficient decision-making process in optimizing the assets. This motivates us to develop an integrated data mining techniques that can support the policy maker in making decision. By integrating the asset data in this research, it is possible for the government to find out how much the potential revenue that can be generated for each of the assets.

This research took place in Palangkaraya, the largest city in Indonesia. The government's assets in this city are scattered in 140 different locations. It also has an appropriate city planning, which is supported by the 12-meter wide roads in this city. Palangkaraya, located in the centre of Kalimantan, is occupied by

only 400,000 people in an area of 2,100 km^2. Its economic growth is above the national growth, which is around 7.4%-7.9% in 2017 with the inflation rate of less than 3.76% (Bank of Indonesia 2017). The Central Government assets of lands and buildings are the objects of the research. The utilisation of lands and buildings of public assets in this model is limited to business activities that generate income for the tenants.

Overview of Asset Use in Indonesia

Based on the regulation of the Minister of Finance, the use of land and building at lease are for three goals. Firstly, to optimise the utilisation of the idle land; next is to obtain additional supporting facilities on site of any public service, and lastly, to prevent the illegal ownership of the land and building. During the term of the lease, the government forbids tenants to rent back the premise and the process is done without disrupting the government duties and functions. Optimization of the idle land is appropriate with the use of land for retail locations such as stores and kiosks. Shops and kiosks are built on land with semi-permanent constructions so they are very flexible to be lifted after the period ends if the government needs to use the premise again.

BMN leased land and building in Indonesia might be used for many purposes, such as for ATM gallery, retail location, rental room, even for the base of the telecommunication tower. It suits the statement from Fanning (2005) who says that a specific location can have various possibilities of use in accordance with the highest occupancy rate and best use. To ensure that the legal element, which is one of the highest and best use (HBU) of the terms is met, we employed the land designation maps city of Palangkaraya as one way to select a state-owned land which can be leased. HBU is the reasonable calculation methods and it is likely to reach the highest value of the land after considering all possibilities which are allowed legally, physically and economically (Fisher & Martin, 1994).

In this study, we limit the use of land and building only on lease for store, kiosk, and room. Simply because the demand on those choices is quite high and favourable in many locations. Based on the lease vacant proposal submission data at DGSAM branch office in Palangkaraya, state-owned land which can be leased has some characteristics: unoccupied, which is located on the side of the road; or land/building at government institutions, which gives service administration, and in health or education facilities. These characteristics are used in GIS analysis to select the location of the state-owned assets which can be utilized.

Government-owned land lease for store and kiosk have some advantages for tenants. Those are: strategic location, easy access, and proper infrastructure. However, there is one disadvantage among many; land or building owned by the government is not designed to support business activities. Therefore, tenants need to spend extra cost to renovate or even worse to build the site into shop or kiosk.

In 2017, it was noted that in Palangkaraya there were 37 government's land sites which were rented to be constructed as kiosks or shops.

The primary aim of Indonesian government in building guesthouse is to provide a temporary residence for employees, facility for educational institution, or public facility for Hajj service. Based on the results of the revaluation of all the state-owned assets, there are 141 available rooms owned by Indonesian government in Palangkaraya which can be utilized. Yet, today's proposal for guesthouse rent is only 48 rooms. The use of GIS in our model is to measure the attributes of the location and the accessibility of data training and the locations of the guesthouse.

Geographical Information System and Artificial Neural Network

The number of data and information which have to be calculated in many places in the vast area requires us to use the accurate and fast technique of analysis. The one that we have chosen is the integration between geographical information system (GIS) and artificial neural network (ANN). GIS has advantages in displaying large number of data, where the visual display can facilitate the valuer to identify the outlier data (Linné & Cirincione 2010).

GIS in this study is employed to display on map the data of the land as well as the locations of the government buildings that can be rented through the selection of legal aspects which bind each state-owned land. It is also implemented to determine how the land can be used. Spatial analysis is useful to understand data through visualisation, to measure dimensions, to build a good rapport, to determine the best locations, to detect and quantify patterns in the data, and to make predictions (ESRI, n.d.) as well as to place information (Podor & Nyiri, 2010). GIS information integration into the process of mass modelling might allow the complete visualization of the valuation process (Linné & Cirincione 2010).

ANN can show better results than multi-variation analysis in non-linear network and it can even count the subjective information such as the characteristics of a zone that is hard to be analysed by existing mathematical approach (Chiarazzo, Caggiani, Marinelli, & Ottomanelli, 2014). ANN is unique because the sensible structure and algorithm model can emulate the comparative approach (Sarip, n.d.). ANN is used to predict rents because it has a reliable approach capability against nonlinearity on some variable, determining the value of the lease. By assuming a black box which contents are unknown, ANN will find the pattern of the relationship between input and output through a phase of training (learning). ANN analysis is determined by three things, namely; 1) architectural network 2) training and learning methods, and 3) activational functions.

Data mining is part of the process of finding information in the database (Fayyad, Shapiro, & Smyth, 1996). Linné and Cirincione (2010) stated that the

database can help good seller or buyer to understand the influence of supply and sale indicated by the property which is available or has been bought.

ANN is a form of computation that has characteristic like the workings of the neural network in living things with the concept of neuron to process input/output. ANN has characteristic of human brain neural like remembering, counting, generalising, adapting, and being efficient.

METHODOLOGY

We have collected the data on the government assets through the programme of country's asset revaluation at the end of the year 2017. The programme required all fixed assets to be identified, mapped, and reassessed to update the national balance sheet of the Indonesian government. The data that were taken for this analysis were the asset geographical coordinates, surface area and the room in the government building which can be offered for rent.

The external data for GIS analysis was zoning plan and urban development of Palangkaraya, given by the local government. This map includes detailed spatial plan of urban areas until year 2035. We used this map to indicate that the utilisation of state-owned land was not conflicted with the legal aspects of current city planning. GIS was used to find public assets through the following stages:

i. We separated the state-owned land that was legally and economically cannot be used for the purpose of lease: military offices and some offices that were occupied by users less than 20 people per day.
ii. From those process results, we then also separated assets in the form of unoccupied land which were not on the zone of trade and services through an overlay between the state-owned land with the spatial city map of Palangkaraya.
iii. The location of those assets that can be utilized were shown by the results of the process of separation and overlaying while the land area that can be rented out, retrieved based on rule of thumb of state-owned assets which can be leased. They were $80m^2$ for 1 location of education, $56m^2$ for 1 parcel land of administration, health service, and vacant land. The relationship between the land and building becomes very close because of the competition in the market which will encourage optimal combination.

According to the geographic data of state owned assets, we got two locations of the distribution of government assets. The first location was in Bukit Batu district, occupied by only five locations of government assets. The second location was occupied by many government assets, located in the centre of Palangkaraya city. So we chose the second location to develop ANN Model. The location is shown in Figure.1.

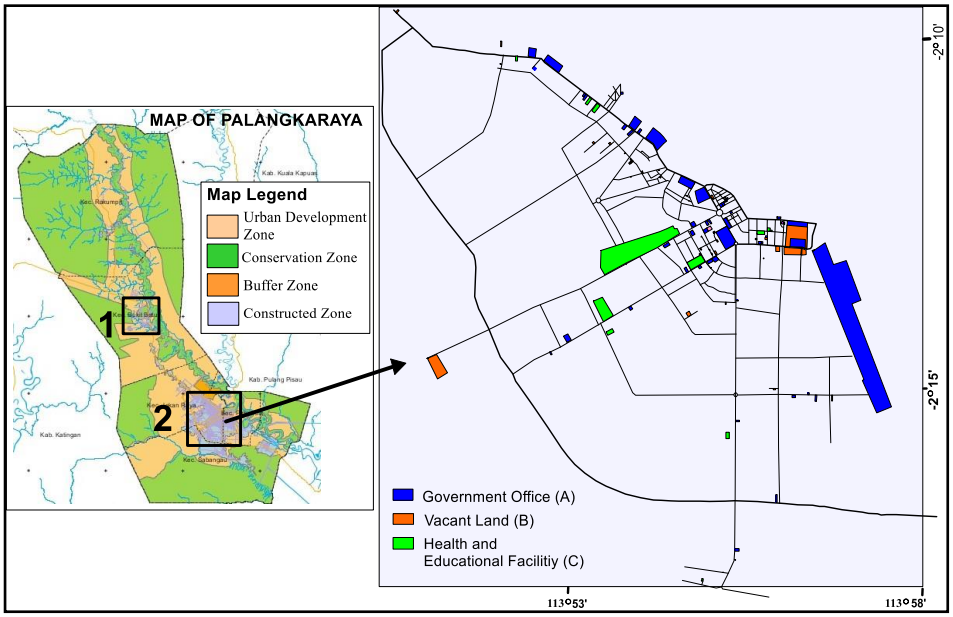

Figure 1: Research location

Market data was used as learning data to predict the reasonable value of the land for lease and rooms for rent. ANN analysis was used to describe the relationship between each independent variable (attribute), which influences rent value in a certain point and the most important variable of rent value was the location. Location analysis relates to the placement of spatial attribute and how this attribute is associated with a particular function (Fanning, 2005). The comparability of location may depend on the proximity to transport nodal point (Syace, Smith, Cooper, & Rowland, 2006).

The government land for rent, calculated with ANN, was based on the sales comparison approach. One of the techniques of data analysis suggested the sales comparison approach by Appraisal Institute (2008) is the analysis of the statistics. Sales comparison technique is the most common technique used in the valuation (Fisher & Martin, 1994) and applicable for all investment property (Sayce et al., 2006). This valuation technique focuses on the similarities and differences that affect the value (Appraisal Institute, 2008). Furthermore, it is used on active markets with a sufficient number of comparable information (Fisher & Martin, 1994).

Prediction value of land for lease and rooms for rent as guesthouse took into account the variables by quantifying the influence of specific variables against the value of the lease. Model of neural network was built using the transaction data and the similar objects for lease. The results were then used to predict the value of the lease. The stages of this research is shown in Figure 2.

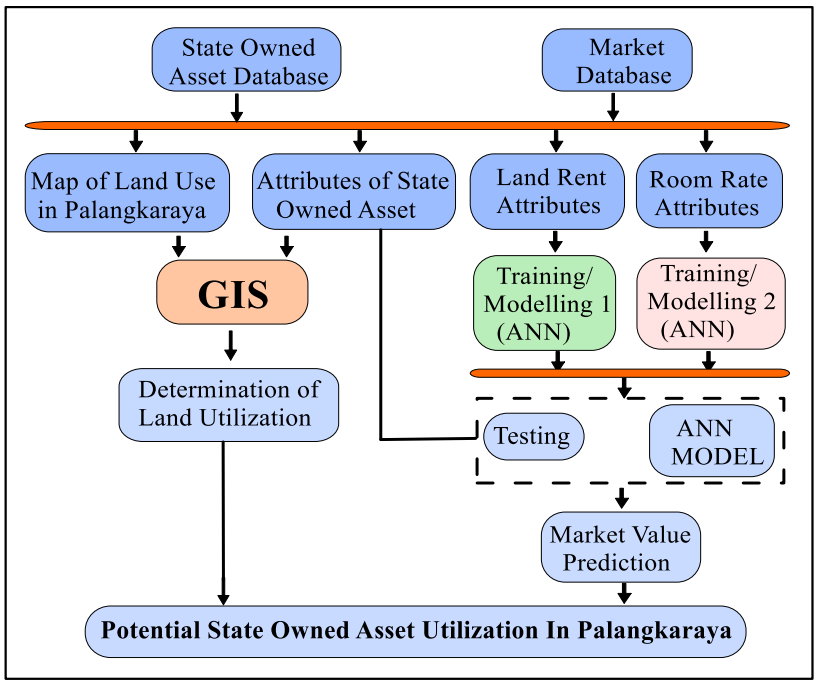

Figure 2: Research framework

The data conversion process was conducted to generate data on the same form. Land and building rental information, for example, must be changed first into land rental rates by removing the portions of the building. Some valuation techniques that can be used to perform the separation is the residual land, allocation and extraction (see Fisher & Martin, 1994; Appraisal Institute, 2008). In this study, the value portion of land lease and building lease are considered to be equal to the portion of the value of the land and the value of the building. Some of the things that we saw in separating the portion of building are: 1) Data were taken by similar use that was commercial, 2) Data which were taken, were in large quantities, 3) Data were taken from the same zone, 4) Data property was estimated to be on the same timeframe because it greatly affected this separation technique.

Economic analysis of land and building for rent refers to the market data comparison approach which requires us to collect transaction data or to offer comparable and similar objects. Lease of land and building data were obtained via the Internet and through interviews with the land owners. We have collected all the data with the provision of trades and services. In every area of store, we took one data. We have taken some information of room for rent on almost all non-star hotels and guesthouses, which were comparable in Palangkaraya.

Altogether, 121 land lease data and 90 room data were obtained. The attributes of land for rent and room rate are described in the Figure 3.

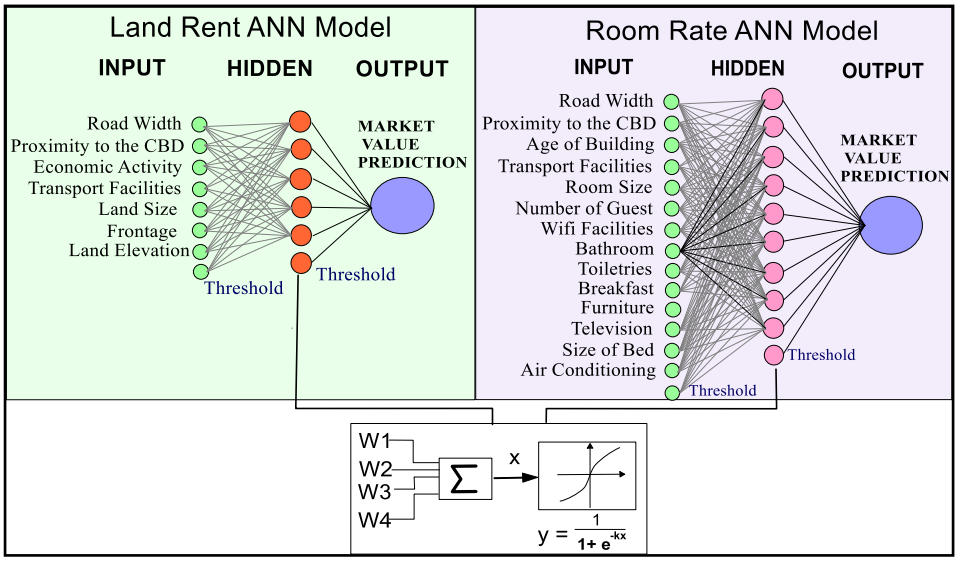

Figure 3: Land rent and room rate attributes in ANN scheme

RESULTS AND DISCUSSION

Through data processing, it is known that there are 2.15 km^2 of land area of state-owned assets in the city of Palangkaraya. Based on the overlaying analysis for the location of the assets, the state-owned properties, and the unfamiliar land using map in Palangkaraya, the information has shown that there is a vast land which is 14,302m^2 that can be used for rent. The location of the lease land is shown by the coloured polygon in Figure 4. The prediction of the rental value of ANN results for all land utilisation is included in the Figure 5.

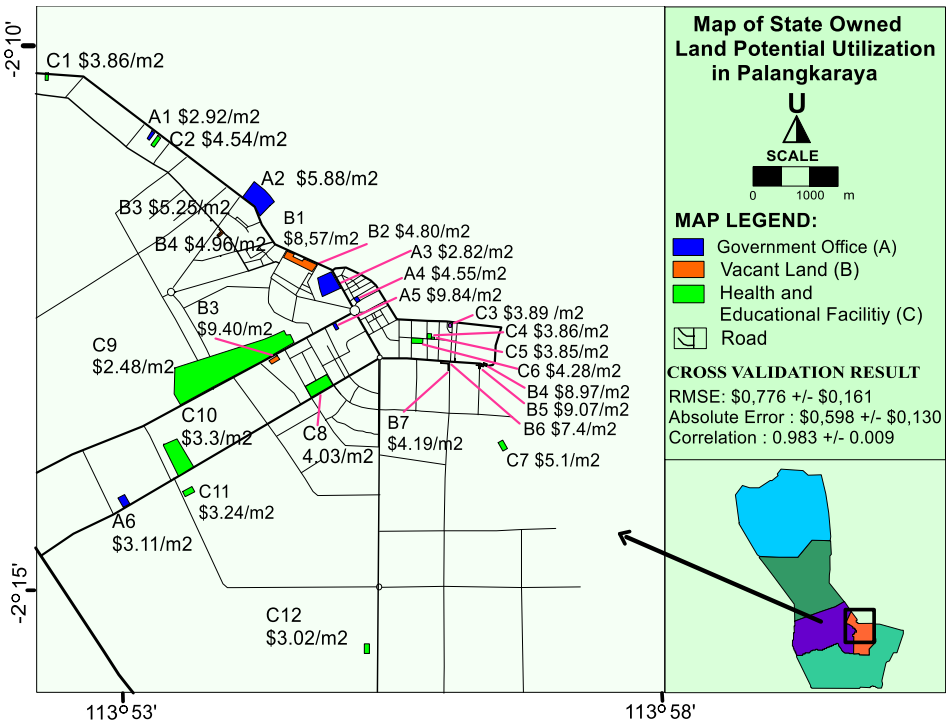

Figure 4: Map of state owned land potential utilisation in Palangkaraya
Source: Primary data processing

We obtained the best results for the ANN model with parameter: hidden layer: Single layer, training cycle / Epoch: 1000, learning rate: 0.2, and momentum: 0.2. We set up the training cycle at 1000 to avoid over fitting phenomena where the formed network indicates less error in the training process but points out high errors in the validation. The Root Mean Square Error for land rent model is $0,776 +/- $0,161. The state revenues from land lease is shown in Table 2.

Table 2. The estimation revenue of state owned land utilisation

	Total area (m2)	Land rent ($/m/Year)	Revenue ($/Year)	Explanation
Office (A1 - A7)	392	2.23 – 9.79	1,627.92	7 locations
Vacant Land (B1-B12)	12,950	2.24 – 9.40	80,771.54	231 parcels in 12 locations
Educational & Health Facilities (C1 - C12)	960	3.02 – 4.54	3,640.67	12 locations
TOTAL	14,302		86,040.13	

The State revenue from the land lease was calculated by multiplying the land rent value with surface area. In this calculation we took the assumption that the occupancy of land rent is 100%. As a result, a total revenue of land lease is $86,040.13/year

The buildings are available in four different sites, which have 141 rooms with various types. Based on the analysis of artificial neural network, the information of room rate value was retrieved. The Root Mean for room rate model is $0.60 +/- $0.264. Market value of room rate prediction based on ANN Model and cross validation result is shown in Figure 6.

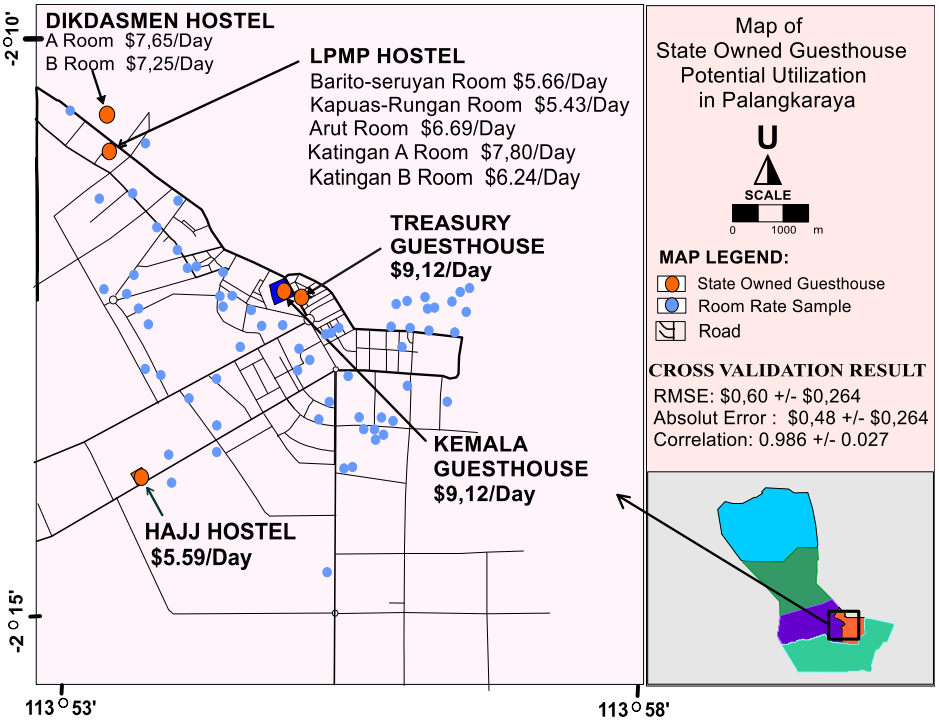

Figure 5: Map of state owned guesthouse potential utilisation in Palangkaraya
Source: Primary Data Processing

The result of the calculation of ANN indicates the room rates/values of state-owned guesthouses are in a range of $5.43 to $9.12/day. The state revenue taken from the room for lease is calculated by multiplying the room rate with annual occupancy of non-star room in Palangkaraya (31.55 %) (BPS, 2018) and the number of days in a year (see Table 3). The estimated state revenue from room lease is $106,342.55/year.

Table 3. The potential revenue of state owned guesthouse utilisation

Room	Number of room	Room rate ($/day)	Annual revenue with occupancy 31.55% ($/year)
LPMP Hostel			
Barito-Seruyan Room	16	5.66	10,436.77
Kapuas-Rungan Room	16	5.43	10,002.90
Arut Room	4	6.69	3,088.60
Katingan A Room	4	7.80	3,594.80
Katingan B Room	4	6.24	2,874.30
Dikdasmen Hostel			
A Room	20	7.65	17,619.78
B Room	19	7.25	15,862.23
Treasury Guesthouse	4	9.12	4,198.72
Kemala Guesthouse	4	9.12	4,198.72
Hajj Hostel	50	5.99	34,470.34
TOTAL			106,342.55

CONCLUSION

Data mining can indicate the location and the magnitude of the potential value of the lease on the location of the area of study. The total effective of non-tax revenue from land for rent and guesthouse for rent in Palangkaraya is $192,382.68/year. We recommend that the DGSAM should take action to optimise land and building utilisation guided by this research. We hope DGSAM will develop this method in different cities and on different types of utilisation. We believe that the implementation of this method can accelerate DGSAM to become a revenue centre.

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RURAL AGRO-TOURISM AND LOCAL COMMUNITY INCOME: THE CASE STUDY OF CLUSTERED HOMESTAYS IN KELANTAN AND TERENGGANU

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Abstract

This research outlines the analysis of income generation basing on agro-cultural tourism of homestays under the purview of Ministry of Tourism and Culture of Malaysia. Using a case study of Kelantan and Terengganu, the research elaborates on the levels of income generated from agro-tourism, distributions, administrations, factors leading to the success of homestays in generating additional income and strategies of infrastructural improvements of homestay. Tourism is one of the largest contributing sectors (13%) to the National Gross Product (RM153 billion) in 2015. Agro-tourism provide opportunities for the visitors to stay and experience the life of an agriculture community in rural areas. Kelantan and Terengganu are rich with agricultural produce, thus have the advantage of showcasing the unique attractions to various tourists' types. Homestays in Kelantan and Terengganu are limited in research. Hence, this research aims to assess the rural agro-tourism and local community income generated from homestays in Kelantan and Terengganu.

Keyword: homestay, agro-tourism, tourism, Kelantan, Terengganu

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INTRODUCTION

This study centres around the analysis of income generation basing on agro-cultural-tourism among rural communities. The focus is on homestay operations and economic opportunities generated, specifically concentrating on case studies of Kelantan and Terengganu. In particular, the ambit of the research is those homestays operating upon registration with the Malaysian Ministry of Tourism and Culture (MOTAC), regulated and monitored by relevant agencies. The clusters of 8 homestays in Kelantan and 10 homestays in Terengganu can be associated with 152 and 185 operators respectively, according to MOTAC.

Table 1 highlights the tourist arrivals and their stay in homestay accommodation in Kelantan and Terengganu. It shows the figures for Kelantan have slightly decreased from year 2012 to 2013 and decreased dramatically from year 2014 to 2015. Meanwhile, those of Terengganu show good performance as they were increasing year by year, except in 2014 and 2015. It can be clearly seen that there has been a large increase in the tourist arrivals from homestay accommodation in Kelantan for the years 2013 to 2014 as due to the reduction in the cost of the homestay package. In addition, the public and private sectors also vigorously promoted the homestay programme.

Table 1: Tourist arrivals and their stay in homestay accommodation

State	2010	2011	2012	2013	2014	2015	2016
Kelantan	1,048	2,021	3,935	3,201	11,152	5,991	3,972
Terengganu	2,999	3,628	4,754	4,978	3,066	2,724	4,058

Source: MOTAC, 2017

This is one of the critical success factors considered when analysing the data in this research. However, these figures are still comparatively lower than those of national average, especially when contrasted against Melaka, Penang and Klang Valley tourists' arrival. Many unsuccessful stories of homestays have been attributable to unattractive destination such as the homestays location and the support facilities including the infrastructure installation (Palmer, Wolff, & Cassidy, 2008; Chew 2009; Lussetyowati, 2014; Ismail, Masron, & Ahmad, 2014; Huibin, Marzuki, & Abdul Razak, 2013).

Hence, it is this gap in the literature that this proposed research is focusing to bridge, to come out with relevant improvements to the existing homestays. By increasing homestays' attractiveness for both the domestic and international tourists, more arrivals and more income generated from these activities can be realised.

LITERATURE REVIEW

Homestay

Homestay programme is a community-based programme where tourists can have interaction and direct experience of the day-to-day life of the community (Thapaliya, Rai, Shrestha, Parajuli, & Pandey, 2012). Wipada (2007) further elaborated that homestay is one of the type of lodging where tourist stay with the homeowners with the intention to learn culture and lifestyle from the homeowner who is willing to share their culture. Moreover, homestays gain their popularity as they enable visitors to experience life as it is lived day to day in the host country. These types of accommodations have the good potential to promote cultural exchange by sharing life and family experiences (Richardson, 2004).

In Malaysia, homestay accommodation is mainly operated and organized by rural communities or village residents. According to MOTAC (2017), a homestay programme gives tourists the opportunity to stay with a chosen family, interact and experience the daily life of their homestay family and learn the culture and lifestyle of the rural community in Malaysia. It focuses more on lifestyle and experience, including cultural and economic activities.

Rural Agro-Tourism

The concept of agro-tourism is a direct expansion of eco-tourism and one of the important segments of the rural tourism, which encourages visitors to experience the limelight of agricultural life at first hand. Agro-tourism is a segment and part of rural tourism, and relates to tourism on farms. To see unique culture and life style in rural areas, tourists have to visit rural places where traditional lifestyle and culture are preserved in its traditional form (Gurung, Simmons, & Devlin, 1996).

Infrastructure

The essence of every tourism destination is its tourism infrastructure facilities. The quality of a destination's infrastructure is a key part of its tourism offering, particularly in relation to the visitor's experience being at the destination. Tourism infrastructure can be considered as the physical elements that are designed, planned and developed to cater visitors' needs. Tourism infrastructure comprises both 'soft' and 'hard' infrastructure. Hard infrastructures are tangible, physical and durable installation utilities, facilities and amenities to support tourism destination accessibility and make attraction more competitive for the enjoyment and experiencing of tourists. Soft infrastructures are those intangible, intellectual, human capitals, skills and installation of facilities and amenities.

Study Site: Kelantan and Terengganu, Malaysia

By 2016, there were ten (10) and eight (8) homestays operating in Terengganu and Kelantan respectively (Table 2). Besides the accommodation, the visitors will experience a variety of activities in the homestay programme. The activities offered to the tourist include agro-based activities such as rubber tapping, palm oil processing, aquaculture, fishing, turtle hatching, agriculture product and handicraft making, and "Trigona/ Kelulut" Honey farm visit. On the other hand, the non-agro-based activities in this homestay programme include visiting to famous places, river cruising, village touring, fireflies watching, traditional culture night, visiting historical sites, cooking traditional food activity and visiting cultural and norms places (MOTAC, 2017).

Table 2: List of homestay in Terengganu and Kelantan

Homestay in Terengganu	Homestay in Kelantan
1. Homestay Kg. Teluk Ketapang, Kuala Terengganu.	1. Homestay Kg. Pantai Suri, Tumpat
2. Homestay Felda Selasih, Besut	2. Homestay Renok Baru, Gua Musang
3. Homestay Felcra Keruak, Jerteh	3. Homestay Bukit Jering, Jeli
4. Homestay Kubang Depu, Setiu	4. Homestay Kg. Batu Papan, Gua Musang
5. Homestay Kg. Rhu 10, Kuala Nerus	5. Homestay Kg. Kubang Telaga, Bachok
6. Homestay Kg. Pulau Duyong, Kuala Terengganu	6. Homestay Seterpa, Kota Bharu
7. Homestay Kg. Buloh, Hulu Terengganu	7. Homestay Kg. Jelawang, Dabong
8. Homestay Jerangau, Dungun	8. Homestay Kemunchup, Machang
9. Homestay Kg. Pasir Raja, Dungun	
10. Homestay Seri Bandi, Kemaman	

Source: MOTAC, 2017

RESEARCH METHODOLOGY

This paper deployed two data gathering methods for primary and secondary data. For the primary data, unstructured interview session was carried out on homestay operators identifying factors relating to homestay quality and success, infrastructure support, experiences with agro-tourism as well as issues and problems relating to tourism in general in Kelantan and Terengganu. As such, focus group discussion were held over a few sessions, both in Kelantan and Terengganu during data collection period. Tourism authority officers were interviewed to confirm and validate the findings of both content analysis and the transcribed or narration of focus group discussion. Focus group discussion were undertaken from August, 2016 until February 2017 at homestay locations as well as at the offices of the relevant agencies. In total, this research conducted 139 interviews with homestay owners.

ANALYSIS AND DISCUSSION

Homestays in Kelantan and Terengganu

There are 152 homeowners from 8 villages that offered 182 rooms for tourist to stay under the homestay programme in Kelantan. Meanwhile, in Terengganu the homestay programme involves 10 villages with 185 homeowners that provide 187 rooms for tourist to stay (MOTAC, 2017).

Infrastructure

Physical infrastructure was available and provided with easy access of homestays such as airport, seaport/jetties, road network, and communication facilities as well as electricity, water and other utilities.

Socio Demographic

Gender distribution of the respondents was unequally distributed. The majority of those participating in the focus group discussion was female, contributing to more than 71 percent (three quarter) of the 139 respondents. This, however would provide a balanced homestay environment and activities for both males and females renters. Age pattern was unequal with more than 35% of respondents being in their 50s, followed by 60 to 69 years old (32%), 40 to 49 years old (20%), 70 and above years old (19%), 30 to 39 years old (3%) and 20 to 29 years old (1%) (Table 3).

Table 3: Age range of homestay owners (respondents) (n=139)

Age range (years old)		Percent
Per Homestay unit	20 - 29	1.4
	30 - 39	2.9
	40 - 49	20.1
	50 - 59	34.5
	60 - 69	32.4
	70 and above	8.6
	Total	100.0

Source: Study Visit, 2017

Education level was also unfairly distributed with the highest proportion (55%) having completed secondary school level of education. This would reflect the types of training and skills possessed by the owners and operators of these clustered homestays. The type of employment also varied, with small proportion being part-time workers (4%). The majority (63%) were in others group of workers. As a result, the household monthly income captured was also not equally distributed. Some 36% of the households from which the respondents come from were earning between RM1,000 and RM1,999, an income range considered lower

than the national average. 25% of the homestay owners earned less than RM1,000 monthly. It can be preliminarily concluded that homestays in Kelantan and Terengganu were operated by low income households.

Initial Preparation of Operation

Some 45% had training on product presentation while only 24% had experiences preparing a simple book keeping. Due to various reasons including demographics, only 27% had computing skills training. Training agencies were limited to only several including MOTAC, KETENGAH, Co-Operative College of Malaysia, Ministry of Health, KESEDAR, INFRA and a collaboration training session by KESEDAR and INFRA.

Fiscal and monetary initial investment began at the level of RM100 up to RM250,000. Most (61%) of the participants started their initial investment below RM1,000. About 9% invested between RM5,000 to RM6,999, and 6% invested as much as RM1,000 to RM2,999 for their homestays, while only 3% made investment of an amount ranging RM7,000 to RM8,999. Detailed distribution of the initial investment is presented in Table 4.

Table 4: Investment range by homestay owners (n=139

Investment Range		Percent
Per homestay unit	below RM999	61.2
	RM1,000 - RM2,999	8.6
	RM3,000 - RM4,999	5.0
	RM5,000 - RM6,999	9.4
	RM7,000 - RM8,999	2.9
	RM9,000 - RM10,999	4.3
	RM11,000 and above	8.6
	Total	100.0

Source: Study Visit, 2017

Operational Homestays

Years of the beginning of the homestay operation ranged from 1996 (11%) until 2016 (8%). In other words, some homestays have been operating for more than two decades, while others were as young as one year. The variation explained the dispersion of levels of success and sustenance of the operation.

MOTAC's visit and recognition were important in sustaining and maintaining the quality of homestays in Kelantan and Terengganu. The visit runs every three years. A village selected to participate in the homestay programme must meet specific criteria and comply with guidelines issued by MOTAC in order for homestay programmes to be carried out effectively and efficiently. Recognition process started from the date when an application to join the homestay programme was made.

Visitors and Stayers of Homestays

A range of one to 13 rooms were on offer at any one time by the participants attending the focus group discussion session. The majority (42%) had one bedrooms for rent, followed by two rooms (36%). Three rooms were offered by only a small number (14%) of the respondents. The revenue received from rental per room/house ranged from RM30 to RM150 per night. Some 31% homestay owners charged RM80 per night, while about 20% charged RM50. Some 19% charge RM60 per night, while 10% charged a nightly rate of RM40.

Agro-based and Non Agro-based Activities

The most popular agro-based activities were agriculture product and handicraft making (84% of respondents), rubber tapping (64%), fishing boat trips (57%), palm oil processing (47%), aquaculture (34%), and turtle hatching (6%). Some homestay owners also prepared activities such as extracting honey (4%), production process of chilli sauce (4%), visiting orchard (4%) and visits to paddy field (2%).

Meanwhile, non-agro-based activities were also conducted by the homestay owners as attractions in the homestay packages. Respondents were with provided traditional culture night experience (95%), village tours (94%), traditional food cooking (94%), river cruise (69%), historical site visits (48%) and fireflies watching (9%).

Benchmark Case Study

In Kelantan and Terengganu, the MOTAC auditing visits was only one or twice a year, in Banghuris and Dorani, such visits were more frequent, being three times in a year (Wagiman, personal communication, March 3, 2017). Through these visits, homestay standards and quality are ensured to be at the highest level, consistently. During the visits, audits and assessment of quality and quantity of services are made, remarks on improvement are provided for actions to be taken by the homestay management committees before next visits are initiated.

Individual promotions of own homestay communities are more rigorous and frequent in Banghuris and Dorani compared to those of Kelantan and Terengganu. Similarly, interpretation of local products, agricultural produce and eco-tourism activities by homestay owners to international inbound tourists were made more meticulously and extensively in Banghuris and Dorani compared to those of Kelantan and Terengganu homestays.

Table 5: Comparison between benchmark and case studies

	Banghuris and Dorani Homestay, Selangor	Kelantan and Terengganu Homestay
Operating Year	1996	2006 (22% of respondents)

Training Area	i) Customer service ii) Product presentation iii) Simple book keeping iv) Computer Skills v) Tour Guide vi) Language: English, Japan, Korea	i) Customer service ii) Product presentation iii) Simple book keeping iv) Computer Skills v) Language: English, Japan
Rooms for rent	1 and 2	1 (42% of respondents); 2 (36% of respondents)
Cost for rental rooms	RM120 per head/night (Banghuris) RM100 per head/night (Dorani)	RM80 per head/night (31% of respondents) RM50 per head/night (20% of respondents)
Tourist per month	30 (Banghuris), 10,000 – 12,000 tourist annually 10 (Dorani), 5,000 tourist annually	1 (35% of respondents) 2 (29% of respondents)
Annual Income from Homestay	RM2000 – RM3000 (per month/Banghuris)	RM200(26% of respondents) RM300(20% of respondents)
Agro-based activities	i) Tours to Coffee, Rubber and Orchard Plantation (Banghuris) ii) visit to paddy field, banana and potato chips factory (Dorani) iii) Rubber tapping iv) Fishing v) Agriculture product & Handicraft	i) Agriculture product & Handicraft (84% of respondents) ii) Rubber tapping (64% of respondents) iii) Fishing (57% of respondents) iv) Palm Oil Processing (47% of respondents) v) Aquaculture (34% of respondents)
MOTAC visit	3 times annually (Banghuris) Once a year (Dorani)	Once a year (46% of respondents) Twice a year (30% of respondents)
Infrastructure	i) Multipurpose Hall ii) Canteen iii) Homestay office iv) Jetty (fishing) v) Recreational area	i) Community Hall (55% of respondents) ii) Free WiFi (11% of respondents)

Source: Study Visit, 2017

CONCLUSION AND RECOMMENDATIONS

It can be concluded that incomes generated from agro-tourism related homestay activities in Kelantan and Terengganu are currently not sustainable. It is very difficult for the owners to maintain and manage their homestays and sustain the

living standard solely based on the receipts from homestays rentals. If the income continues to be at such low levels, homestays may have to seize operation in the very near future.

Based on other success factors such as tourist annual, repeat visits, soft infrastructure, rental receipts and assets/wealth accumulation, Kelantan and Terengganu homestays could not be classified as successful. Hence, to improve and upgrade these circumstances, the following are recommended as way forward for these homestays.

Making Homestay A Primary Activity of Agro-Based Tourism

It is recommended that homestays to be a primary activity of agro-based tourism. First, homestay experiences must be upgraded to be at par with three-star hotels or motel quality where the accommodations provided deliver a broad range of amenities such as good quality service, design and physical attributes that match guest/renters expectations. Beddings, toilets, living rooms and kitchen must be clean, well-planned and laid out, and easily maintained.

Increasing the Income of Agro-Based Tourism and Homestay Activities

Income can be increased through value adding the local produce. If raw materials are marketed, the values are lower, hence income for homestay owners can be stagnant. However, if the raw materials are processed, packed packaged attractively, pickled or accentuated to have better longevity and durability, upgraded and researched into medicinal herbs and tablets as well as aqua-fishery herbal essences, marketed rigorously and exported in the highest quality; income can be increased by many folds.

Motivating and Supporting the Success Factors of Homestay

The success of Homestays in Banghuris and Dorani and other ASEAN examples (Ban Rai Kong Khing in Chiang Mai, Koh Yao Noi, Thailand and Homestay Adiluhung, Yogyakarta) are due to the initiatives, strong willed and knowledgeable communities running the homestay operations. Investing in human resources or human capital are the long term strategy suited for Kelantan and Terengganu homestay operations.

Upgrading Added Value of Agro-Based Activities

Upgrading of local produce would include strategies of diversification, intensification, interpretation and research and development. Products must be researched and developed to identify their further potential as medicinal herbs or essence or tablets. Products quantity can also be intensified through mass production in manufacturing plants. Durability and longevity of produce can be ensured by high quality packing and packaging. Modernizing the product

processing sectors using the efficient equipment also is one of the way to value addition and processing of local agro-products.

Developing Soft Infrastructure among Homestay Operators

Soft infrastructure includes skills, training, motivation, experience and knowledge. Formal training and education can be initiated in areas of agro-based research and development. Regular workshops, training and homestay operators/ owners meetings help reinforce best practices and address new issues. While learning soft skills is not simply "book learning", there still must be as aspect of education on best practices.

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FACTORS AFFECTING THE HOUSING PREFERENCES OF HOMEBUYERS IN KUALA LUMPUR

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Abstract

The Malaysian Property Market Report 2016 reported that Malaysian properties transactions were down, office occupancies were down, and simultaneously unsold units were up. Almost two thirds of the total homes that developers launched remained unsold, comprising 90,491 units at the end of 2016 including of those completed, under construction, and not constructed. In recent years, the declining phenomenon in the property market is getting worse apparently. The reason behind this situation is mainly due to the rising cost of living which causes the purchasing power to be weakened; therefore, to buy a property or even goods for daily use has become difficult as the overall spending power of the Malaysians has decreased. Determining the important factors that impact upon the decision making of the house purchasing process could develop a better understanding for both buyers and home providers which eventually could avoid the 'unsold' properties scenario in the market. Hence, the objective of this research is to evaluate the relationship between the three main factors identified which are financial, location, and neighbourhood towards the housing preferences of homebuyers in Kuala Lumpur. A total of 100 respondents, ranged between 25 to 34 years old, responded to the survey, and the results were derived using the multiple regression analysis. The results favour the locational factors that contribute significantly to the determination of a buyer's preferences when purchasing a house.

Keywords: housing, housing preferences, homebuyer in Kuala Lumpur

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INTRODUCTION

In Malaysia, residential housing is the dominant properties in the real estate market. It recorded the highest percentage of 65.2% of the overall real estate market. Johor, Pulau Pinang, and Kuala Lumpur are the dominant states in residential properties with 20.4%, 16.9%, and 8.3% shares of the market, respectively. The Property Market Report (PMR) in 2015 revealed that the property market performance slowed down by a marginal 5.7% in volume and 8.0% in value of the overall performance property market in 2014. In 2015, there were 70,273 housing units launched compared to 68,351 housing units in 2014. On the other hand, the unsold housing units for 2015 were 41,184 units (58.6%) compared to 47,506 units (54.61%) in 2014. Thus, the residential property showed retardation in the overall performance, and 58.6% of the launched units remained unsold in 2015.

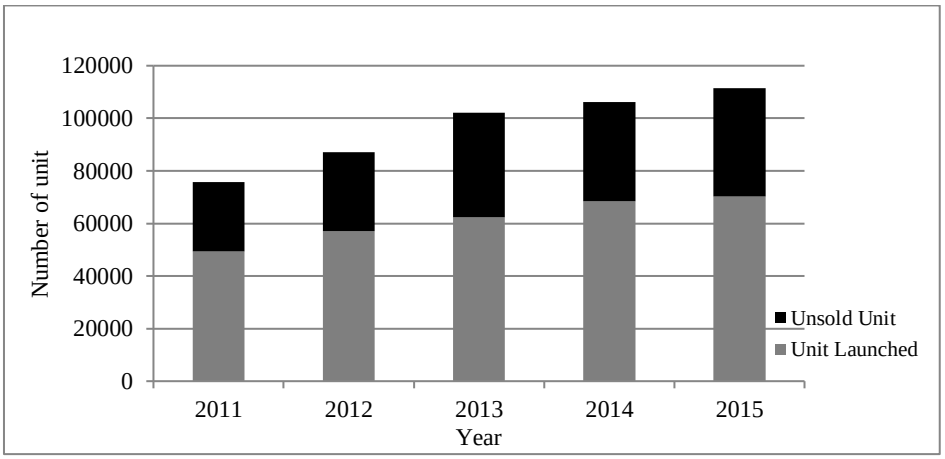

Figure 1: Launched and unsold units in Malaysia
Source: JPPH (2011-2015)

Besides, the total number of residential properties transacted in Malaysia decreased in 2015 compared to 2012 from 272,669 to 235,967 units based on the Property Market Report. It also stated that from 2013 to 2015, the unsold units did increase significantly from 9,361 units to 31,261 units in the total numbers. The sold units in Kuala Lumpur had decreased from 40,522 units in 2014 to 33,781 units beginning of 2015 and continued to decrease significantly towards the end of 2015. Residential property transactions per year in Kuala Lumpur faced a similar situation where it decreased from 24,314 in 2011 to 10,606 in 2013 (JPPH, 2015). The declining transactions may result due to various reasons, but the overall scenario showed that the people in Kuala Lumpur paid less focus on the process of selling and buying properties within this period.

The homebuyers' preferences are strongly affected by some factors which eventually leads to the decision making of purchasing a housing unit (Komurlu, Gurgun, & Arditi, 2013). The housing unit that the developer offered to the homebuyers did not meet their preferences and needs has become one of the main factors that caused the launched housing units to remain unsold. According to Petrus (2012), it is a competitive residential property market in Malaysia because most of the residential property developers in Malaysia are utilising the sell-then-build concept. The homebuyers can only make a judgement based on the layout plan and description of the property to imagine how their future property will look alike. These will lead to some difficulties in the decision making to purchase property as they need to rely on many contributing factors to decide on the purchase such as type, location, and price. Thus, this paper highlighted the most critical contributing factors in the preferences of a homebuyer in deciding to purchase a house in Kuala Lumpur.

HOUSING PREFERENCES

Housing preferences are the word forms of the housing quantitative and qualitative features that the residents would prefer to have for their home. Preference housing is distinguished into two related terms, which are housing expectation and housing aspiration. Housing aspiration is the desire for housing or standard-oriented towards the future, whereas expectation indicates the realistic assessment of future housing conditions (Morris & Winter, 1978).

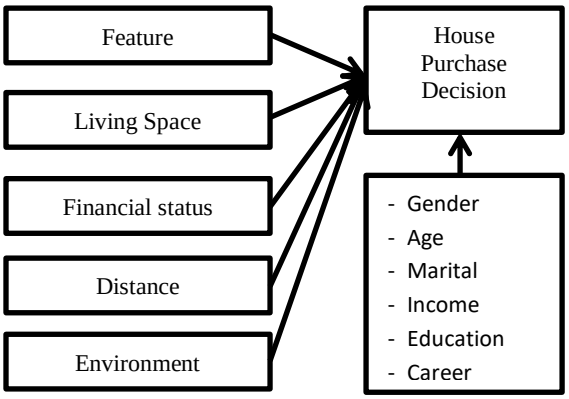

Figure 2: Determinants of homeownership conceptual model
Source: Si (2012)

Si (2012) highlighted the five factors that affect the house purchasing decision which are the feature, living space, financial status, distance, and environment, as shown in Figure 2 above. Meanwhile, Abdullah, Nor, Jumadi, and Arshad (2012) considered that the seven factors that can affect housing purchase are financial or economics, location, neighbourhood, developer's

reputation, interior design and space, family life cycle, and exterior design, as shown in Table 1 below. This research only considered three of the factors, namely, financial, location, and neighbourhood.

Figure 3: House Purchasing Considerations Conceptual Model

Factor 1: Financial/economics	Price of house Capability to obtain financing Term of payment
Factor 2: Location	Proximity to workplace Proximity to amenities Proximity to town centre Proximity to main road, highway, public transport
Factor 3: Neighbourhood	Quiet place Green surrounding Low crime area
Factor 4: Developer's reputation	Reputable developer
Factor 5: Interior design and space	Size of the building Number of floors Building layout design Number of bedrooms and bathrooms Type and quality of finishing
Factor 6: Family Life Cycle	Current house too small Marriage, family expansion
Factor 7: Exterior design	Size of garden Building orientation

Source: Abdullah et al. (2012)

FINANCIAL STATUS

People's demand on the housing ownership is fundamentally determined by the growth of population and formation rate of household, the price of a house, and the growth of income (Flavin, 2002). The continuous increase in house prices has been an issue among Malaysians. A debate on this issue has been stimulated on the reasons, the suggestions, and the budgeted level for the clear majority of the population. The increase in mortgage borrowing that is encouraged by the rise of house price and a low-interest rate allows consumers to spend which is supported by the increase in their income (Hashim, 2010). In normal cases, 30% of a household income is spent on housing (Bujang, 2006). In accordance with the study of the ability to purchase a house, income level is an important factor. Income level determined the ability of a household to purchase affordable housing. Thus, the price and category of houses that are affordable for a household are decided by their income level (Bujang, Zarin, & Jumadi, 2010).

Other than house price and household income, another factor is the ability to afford the housing finance which referred to the financial loans from banks and

government agencies providing loans (Tuccillo & Goodman, 1983). Financing is also defined as a long-term loan with a specific period for the purchasing of a house. The financing loans are provided by the financial institutions to individuals who purchase a house from a developer who has a commitment with the bank (Bujang et al., 2010).

LOCATION

The location of a residential property is another key factor that can affect the homebuyers' housing preferences in Kuala Lumpur. The better the location of a housing project, the more it can generate a higher profit and return to the developer. According to Salleh (2015), location is the main consideration and plays a key role that affects the success of the housing project. A strategic location of a housing project will bring a higher degree of profit and return to the developer. However, a non-strategic location of a housing property may generate lower income and return compared to the housing project with a strategic location. The decision on the location when purchasing a housing property is vital because the house selection will lead to long-term financial burdens to the homebuyers (Litman, 2010). Sean and Teck-Hong (2014) stated that a good location of the residential property could be defined as a residential area with better access to community amenities and facilities. According to Karsten (2010), the distance from their workplace is the main consideration for homebuyers in Malaysia. Traffic jam is the main issue in Kuala Lumpur, and the travelling distance between their workplace and home is their main consideration in purchasing a housing property.

The price and value of the residential property are also affected by the locational factors of a housing project (Elder & Zumpano, 1991). The price of land and house or residential property is higher if the residential property is in strategic location or area that is near to local amenities such as shopping centres, schools, and public transports. Most of the homebuyers will choose their house near to some amenities. On the other hand, the price of the residential property which is located at a suburban area will be lower than the residential property located at an urban area as the distance from schools, shops, shopping malls, and public transports is far from the residential property. A research done by Aluko (2011) showed that the influence of location in the housing market is very significant and strongly affect the homebuyers' decision when purchasing a residential property.

According to Kane, Riegg and Staiger (2006), good quality of school means a quality neighbourhood and a great school area contributes a positive impact on the neighbourhood. Homebuyers with children consider a neighbourhood with school when purchasing property (Komurlu et al., 2013).

NEIGHBOURHOOD

Neighbourhood plays a vital role in the housing preferences for a homebuyer. According to Teck-Hong (2011), a good neighbourhood will affect the residential price. Obviously, a good neighbourhood brings a positive impact on the residential price. Based on the survey done by Aluko (2011), the neighbourhood factors are important and are linked to the housing purchase decision. The safety of a neighbourhood is also considered as another aspect during the selection of property. The level of cleanliness and safety are the main considerations of homebuyers (Chapman, 2006). Low quality of cleanliness and safety will bring down the surrounding housing's price and image. The demand for gated and guarded properties has increased in the recent year, especially in Kuala Lumpur because of the community facilities and security. The gated and guarded community facilities show status and symbol that their property is protected (Teck-Hong, 2011). As a result, most of the homebuyers will select the residential property with gated and guarded community facilities.

The most important factors associated with housing preferences are satisfaction with social contacts within the neighbourhood and lack of concern over encountering unfamiliar faces. It reflects the importance of the residents' feeling of having a supportive broader community of known or familiar social contacts (Buys, 2012). Families are actively creating a network of linked lives within their diverse urban environment. These networks can be specified as demographic characteristics, class position, and ideas about a 'good' family life which will affect the housing preferences in the neighbourhood (Karsten, 2007). Zheng (2011) stated that the preferences of future homebuyers would inspire the landscape design of future houses. As a result, the homebuyers with a greater awareness of nature will prefer a more natural-designed landscape when they purchase a house (Daniel, 2001). Furthermore, there have been a few studies that indicate that a property will be sold at a better value if it is located in a quieter neighbourhood. The house price of a noisier location is 30% lower than the market price compared to the house located in a quiet location (Wilhelmsson, 2000). Traffic noise has always been an issue among homebuyers. A study by Becker and Lavee (2003) stated that there is a 1.4% and 2.4% drop in property values in urban and suburban areas respectively.

CONCEPTUAL FRAMEWORK

In terms of the locational factors, public infrastructure nearby will also increase the value of the property. According to Kaynak and Stevenson (1982), the locational factor is one of the essential factors that affect an individual's decision in purchasing a house. The neighbourhood factors are also very important in a housing purchase consideration. The safety of a neighbourhood, such as whether there is a high crime rate in the area, will affect the buyer's decision. The level of pollutants such as the cleanliness of the residential area or river nearby is

important too. It is confirmed that the environment has a big influence on housing buyer (Al-Nahdi & Ghazzawi, 2015). Financial factors such as the price of the property, amount of loan that the purchaser will be able to borrow from the bank, and also the duration of the mortgage loan that the buyer has to pay, as well as the payment term will also greatly affect the decision of the buyer when they are purchasing property. Financial status is much more relevant to homebuyers' housing preferences (Combs & Hinkle, 1987).

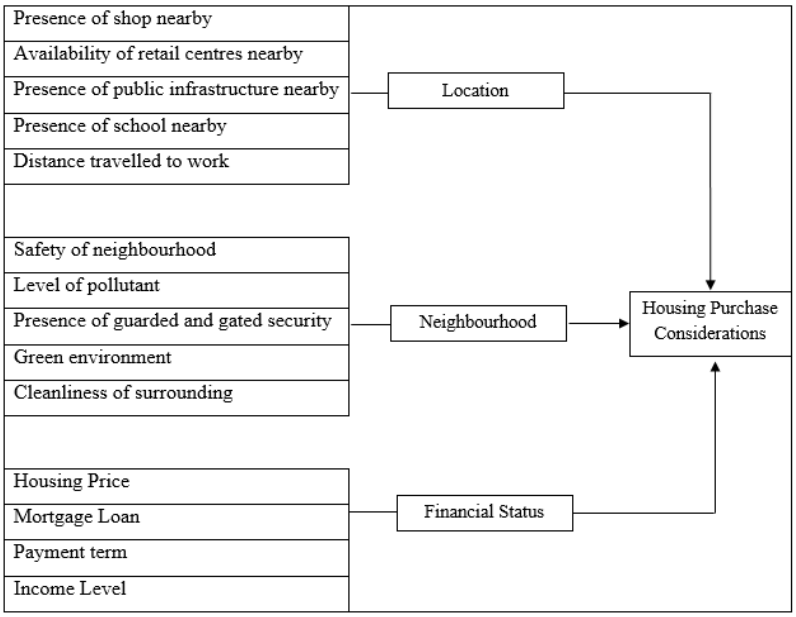

Figure 3: Factors affecting housing preferences among homebuyers

METHODOLOGY

The quantitative research was utilised for this study whereby 150 questionnaires were distributed to respondents, and 100 questionnaires which were answered without error were collected to be analysed. The area for questionnaire distribution was focused in Kuala Lumpur among homebuyers aged 25 to 34 years old. Purposive sampling was used and the information obtained were analysed through SPSS and presented below.

RESULTS

The survey undertaken among the homebuyers in Kuala Lumpur revealed that somehow all the factors have a significant relationship with the preferences and the decision-making process of home buying.

Table 2: Multiple regression analysis

Dependent Variable	Independent Variables	Coefficient Value (B)	Significant Value (Sig.)	Accepted/ Rejected
Housing Preferences	Financial Factors	.200	.054	Rejected
	Locational Factors	.435	.000	Accepted
	Neighbourhood Factors	-.098	.362	Rejected

The results show that there is no significant relationship between the housing purchase consideration and financial status of the buyer. Based on the inferential analysis result, it shows a positive relationship between financial status and housing preferences of homebuyer in Kuala Lumpur (0.200). The value of significance for financial factors is 0.054, which is more than the P value of 0.05.

In contrast to the results of this study, according to Bujang et al.(2010), income level has significantly contributed to the housing market. However, the study says that the relationship between income level and housing affordability that affect the local market is still not clear and needs to be reviewed. Theoretically, interest determined the purchasing of a residential unit. Price, location, and the population's socio-economic environment are the essential factors influencing the homebuyers housing preferences (Rossi, 1955).

The study found that there is a significant relationship between housing purchase considerations and locational factors. The inferential analysis shows a positive relationship between the locational factors and housing preferences of homebuyer in Kuala Lumpur (0.435). The value of significance for financial factors is 0.000, which is less than the P value of 0.05. The importance of consumer housing and location preferences as a factor in urban development patterns is increased. Homebuyers will be more likely to select a residential location that is closer to their workplace, and it will affect the household purchase decision (Jordan, Birkin, & Evans, 2012). Moreover, for married homebuyers, they tend to reside at location selected primarily for proximity to the husband's best job. Homebuyers will also select their housing choice closer to their community such as friends and location that ease their religious prayer (Madden, 1981). In addition, for families with children, a residential location close to the school will be taken into consideration. Homebuyers will also prefer property located near to public infrastructure such as the LRT, highway, bus terminal, and others. Hence, the distance to infrastructure is an important factor in choosing a property for homebuyers too. Also, accessibility to shopping malls and retail shops will also affect the homebuyers in choosing the property.

The results of analysis shows that there is no significant relationship between housing purchase considerations and neighbourhood factors. Based on the inferential analysis result generated, it shows a negative relationship between neighbourhood factors and housing preferences of homebuyers in Kuala Lumpur

with a correlation coefficient of -0.098. The value of significance for neighbourhood factors is 0.362, which is more than the P value of 0.05. Homebuyers will consider neighbourhood factors such as safety, the noise of surrounding, green environment, level of pollutants, and the presence of gated and guarded security before choosing their house of choice. The prime consideration that affects the homebuyers among the neighbourhood factors is safety (Quigley, 1985). Theoretically, a quiet and secure neighbourhood will be preferred by homebuyers. The safety of a neighbourhood becomes a major concern among most of the homebuyers as the crime rates are increasing in Kuala Lumpur (Mohit & Elsawahli, 2010). Homebuyers are also willing to pay more for a quality neighbourhood, and thus enjoy a safer environment (Lang & LeFurgy, 2007). In addition, homebuyers will also take into consideration the availability of facilities including retail shops and restaurants nearby, medical services, police station, and other facilities.

CONCLUSION

Location is the only factor that shows a significant relationship with the housing purchase considerations. This outcome is because Kuala Lumpur is considered to be the best option to work as it is located at the centre point. This reason indicates the importance of strategic locations such as close to workplace, schools and nurseries, as well as easy accessibility, are strongly attached to the daily life of people in Kuala Lumpur. Therefore, homebuyers will consider the locational factors prior to purchasing a house to ensure that they are investing in a suitable location for their stay rather than emphasising too much on the financial and neighbourhood factors.

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TOTAL FACTOR PRODUCTIVITY CHANGE IN THE REIT INDUSTRY: THE CASE OF MALAYSIAN REITS DURING AND POST GLOBAL FINANCIAL CRISIS

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Abstract

The paper examined productivity changes for the Malaysian Real Estate Investment Trust (M-REITs) using a non-parametric approach of Malmquist Productivity Index (MPI) of Data Envelopment Analysis (MPI-DEA). Data was attained from M-REIT annual reports, Thomson Reuters Datastream and Osiris via Bureau Van Dijk for 2007-2015. The non-parametric approach of MPI-DEA examined the Total Factor Productivity Change (TFPCH), Technological Change (TECHCH), Efficiency Change (EFFCH), Pure Technical Efficiency Change (PEFFCH) and Scale Efficiency Change (SECH) indices. On average, the M-REIT industry has faced 14.91% of productivity regress during 2007-2015 period, comprising 49.90% of efficiency increase and 33.40% technological regress. The decomposition of the productivity change index suggests that Malaysian REIT productivity changes were mainly due to efficiency change rather than technological change. These findings could help M-REIT managers to formulate ways to enhance their REIT productivity. The findings are also applicable to similar *Shariah* compliant real estate investment or socially responsible investment.

Keyword: Malmquist index; productivity, technology, efficiency, Malaysian REITs

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INTRODUCTION

Global financial crisis began in 2007 with a crisis in the US subprime mortgage market and the situation getting worse with the bankruptcy of Lehman Brothers in 2008. While the collapse of large financial institutions was prevented by the interventions of national governments to bail out distress banks, stock markets still dropped worldwide. Malaysia was not an exception. Along with other countries, the impact of the crisis on Malaysia has been felt largely through contraction in demand of exports particularly when the economies of its major trading partners fell. The Kuala Lumpur Composite Index, which is the main index and market indicator in Malaysia, has experience a 45% drop in its value within the period of January to September 2008 (Angabini & Wasiuzzaman, 2011). However, despite its severity on the economics, the financial crisis has not been studied yet in terms of its impact on the productivity growth, efficiency change, and the technological progress of REITs.

If confidence in the REIT industry is shaken, both local and global investors may leave the industry and the country, increasing the vulnerability of the real estate industry to subsequent shock. This study will be the first empirical investigation to examine and estimate the total factor productivity (TFP) for Malaysian REITs, using the non-parametric approach of Malmquist data envelopment analysis (DEA) from 2007 to 2015. The remainder of the paper unfolds as follows. Section 2 provides an overview of the review of the literature, followed by methodology and empirical design. Section 4 discusses the empirical findings, which highlight the productivity change of Malaysian REITs and the respective productivity and efficiency sources. Section 5 concludes the article and provides suggestions for future research.

LITERATURE REVIEW

While there has been extensive literature examining the efficiency and productivity in the mature market of the USA, the works on emerging market of Malaysian REITs are still under-researched. Previous works have applied various frontier techniques of estimation for the efficiency and productivity of these REITs. Topuz, Darrat and Shelor (2005) measured the technical, allocative and scale efficiency of US REIT from 1989 to 1999 with results showing that inefficiency was caused by a high level of input use instead of the choice of input mix. Similar approach of estimation of Malaysian Islamic REITs are conducted by Chuweni, Eves, Hoang, Isik and Hassan (2017). Their findings revealed that Malaysian REITs can reduce their input consumption by 35.8% without reducing output, implying significant potential for improvement. Isik and Topuz (2017) employed non-parametric approach of DEA approach on eleven-year dataset from the 1990s. The de novo REITs outperform the established REITs in all form of efficiency scores. The result suggest that these new REITs are 'born efficient' which are likely due to the REIT size, accessibility to finance and are rich with congenital experience. In another study, Topuz and Prather (2007) employed the Malmquist Index to measure the equity REIT efficiency and productivity change

for 1989 to 1999. Regardless of their size, REITs experienced increases in technical efficiency during 1994-1999 due to both managerial and scale efficiency. However, a significant level of technological regress leads to REIT productivity losses. However, none of these studies have critically addressed the productivity performance in the REIT industry, particularly in the emerging market of Malaysia during two different periods: during and post global financial crisis. This present study differs with the above studies in terms of data (Malaysian REITs from 2007 to 2015), approach (use of input/output variables) and foci (productivity change of Malaysian REITs).

METHODOLOGY

For this study, productivity change was measured using the input-oriented Malmquist Productivity Index (MPI). MPI, which was developed by Fare, Grosskopf and Lovell (1994), differentiates the shift production frontier (technological change) and the movement of REIT towards the frontier (efficiency change). The Malmquist index was constructed using the DEA software of DEAP version 2.1 by Coelli (1996). Grifell-Tatjé and Lovell (1996) highlighted three advantages of MPI over Fischer and Tornqvist indices. Firstly, MPI does not require price information for input and output prices. Secondly, MPI does not require restricted assumption (profit maximisation or cost minimisation) in its calculation. Thirdly, panel data allow the decomposition of productivity changes as a product of the effect of catch up to the frontier (efficiency change) and the frontier-shift effect (technological change). The main drawback is the need of a distance functions measurement, which could be resolved by using the DEA. Furthermore, Translog and Cobb-Douglass functions are prone to model sensitivity and functional stability (Topuz & Isik, 2009).

MPI allows us to isolate the effect of catching up or falling behind to the frontier effect (efficiency change) from the effect of outward shift or regress in REIT technological frontier (technological change). In other words, Malmquist total factor productivity change index (TFPCH) is the product of efficiency change (EFFCH) and technological change (TECHCH) under the assumption of constant returns to scale (CRS). This decomposition allows us to identify the sources of productivity change in M-REIT. However, due to the imperfect market competition and regulatory restraints, REITs may operate at increasing return to scale (IRS) or decreasing return to scale (DRS), instead of operating at CRS. Therefore, when we relaxed the assumption of CRS and applied the variable return to scale (VRS) assumption, we were able to further decompose efficiency change into pure technical efficiency change (PECH) and scale efficiency change (SECH). The PECH measures the proximity of REIT to the frontier, devoid of scale effects. The SECH, on the other hand, captures the deviations between the VRS and CRS technology at observed inputs, indicating the changes in efficiency due to movement toward or away from the frontier. In essences, TFPCH =

TECHCH x EFFCH and EFFCH = PECH x SECH. Further discussion on the MPI follows.

Data and Empirical Design

We collected our data from annual reports of M-REITs, Thomson Reuters Datastream and Osiris via Bureau Van Dijk for the years 2007 to 2015. Following previous works on REIT efficiency and productivity, total asset (Y1) were selected as output variables, while interest expense (X1), property operating expense (X2) and administrative and management expense (X3) as the input variables (Anderson, Fok, Springer, & Webb, 2002; Chuweni et al., 2017; Topuz et al., 2005; Topuz & Isik, 2009). Table 1 displays the summary of statistics of data used.

Table 1: Descriptive statistics for inputs and output variables

	Y1: Total Asset (RM million)	X1: Interest Expense (RM million)	X2: Property Operating Expense (RM million)	X3: Administrative & Management Expense (RM million)
Min	171.151	0.21638	1.065	0.9215
Mean	1,700.716	21.378	26.692	11.963
Max	9,568.582	100.361	122.397	76.534
S.D	1,779.108	20.710	32.044	15.939

Source: M-REITs' annual reports

RESULTS AND DISCUSSIONS

In this section, we analyse the performance of M-REITs during (2007-2009) and after the crisis (2010-2015). With reference to Table 2, the Malmquist Productivity Index results indicate that the Malaysian REIT industry has an average geometric mean of TFPCH regress of 14.91%. The result of TFPCH of M-REITs seems to imply that M-REITs exhibited TFPCH regress during all years mainly attributed by 33.40% of TECHCH regress. Our findings were corroborated with the findings by Topuz and Isik (2009) where REIT has failed to improve technically but applied significant effort to catch up with the best practice by depending on aggressive growth strategies. The decomposition of EFFCH into PECH and SECH indicate that the main sources for M-REITs' EFFCH is due to pure technical efficiency (PECH) rather than scale efficiency. The results suggest that M-REITs are more managerial efficient in controlling the operational expenses but not operating at the optimum scale of operations. Table 3 depicts the summary of geometric means of Malmquist Productivity Index for each Malaysian REIT for the period under study. The results indicatethat 2 REITs have exhibited TFP progress namely REIT 4 and REIT 12 with an increase of 2.66% and 2.36% for TFPCH progress respectively. The sources for TFPCH growth could mainly be attributed to the EFF increase rather than technological change.

Table 2: Summary of Malmquist Productivity Index of Malaysian REITs (2007-2015)

	EFFCH	TECHCH	PECH	SECH	TFPCH
2007-2008	1.4640	0.4950	1.3880	1.0550	0.7240
2008-2009	1.1530	0.7800	1.1120	1.0370	0.8990
2009-2010	2.1850	0.3470	1.3040	1.6750	0.7570
2010-2011	0.9090	1.0210	0.9000	1.0100	0.9280
2011-2012	2.6040	0.2790	1.6520	1.5770	0.7270
2012-2013	1.4540	0.6070	1.3160	1.1040	0.8830
2013-2014	1.3740	0.6890	1.2400	1.1080	0.9470
2014-2015	0.8490	1.1100	0.9380	0.9050	0.9420
Mean					
2007-2009	1.3085	0.6375	1.2500	1.0460	0.8115
2010-2015	1.5625	0.6755	1.2250	1.2298	0.8640
2007-2015	**1.4990**	**0.6660**	**1.2313**	**1.1839**	**0.8509**

Table 3: Summary of MPI for Malaysian REIT 2007-2015 (by firm)

REIT/ Index	EFFCH	TECHCH	PECH	SECH	TFP
REIT 1	1.2563	0.6007	1.2247	1.0260	0.7546
REIT 2	1.3321	0.6996	1.1549	1.1534	0.9319
REIT 3	1.7545	0.5529	1.3867	1.2651	0.9702
REIT 4	1.8134	0.5660	1.3549	1.3381	1.0266*
REIT 5	1.2246	0.7195	1.0797	1.1344	0.8810
REIT 6	1.7294	0.5537	1.3843	1.2493	0.9579
REIT 7	1.6382	0.5131	1.3611	1.2037	0.8407
REIT 8	1.6063	0.5817	1.3168	1.2197	0.9344
REIT 9	0.9733	0.8682	0.9587	1.0153	0.8450
REIT 10	1.5345	0.6256	1.0000	1.5345	0.9600
REIT 11	1.0193	0.5696	1.0000	1.0193	0.5807
REIT 12	1.7824	0.5743	1.3560	1.3147	1.0236*
REIT 13	1.5153	0.5973	1.7741	0.8541	0.9043
REIT 14	1.0726	0.5170	1.1353	0.9450	0.5539
REIT 15	0.9434	0.6791	1.0416	0.9055	0.6405
REIT 16	1.0000	0.8369	1.0000	1.0000	0.8369
REIT 17	1.0624	0.5851	0.9999	1.0626	0.6217

Note: grey shades indicate M-REITs with TFPCH growth; EFFCH = Technical Efficiency Change; TECHCH = Technological Change; PECH= Pure Technical Efficiency Change; SECH= Scale Efficiency Change; TFPCH= Total Factor Productivity Change.

Development in the Number of Malaysian REITs with Productivity Gain (Loss) or Efficiency Increase (Decrease)

Analysis based on the number of M-REITs with productivity gain (loss) or efficiency increase (decrease) was performed to address the issue of possible outliers. The results are tabulated in Panel A-C in Table 4. As the results in Panel A of Table 4 indicate, 63% M-REITs have experienced productivity loss for the period of 2007-2015. The number of M-REITs with TFPCH loss is seen to

decrease from 63.18% during financial crisis to 60.86% for 2010-2015. Similar trend could also be observed from the number of M-REITs which experienced technological regress has decreased from 86.37% for 2007-2009 to 74.85% in 2009-2015. It is also interesting to note there is a mix result of EFFCH increase (decrease) and productivity stagnant of M-REITs for the period under study.

Sources of Productivity of M-REITs

Table 5 represents the sources of productivity (growth) and efficiency increase (decrease) for M-REITs during the period of 20017-2015. Table 5 is the decomposition from the results in Table 4. For instance, in 2007-2008, of the majority of 90% of M-REITs which have experienced productivity loss as depicted in Table 5 could mainly be attributed by technological regress, while 10% of M-REITs which have experienced productivity growth were the result of efficiency increase. Apart from that, the results exhibit productivity regress due to technological regress rather than efficiency change for Malaysian REITs. The results are also consistent with other market sectors since Md Saad, Abd. Majid, Kassim, Hamid and Yusof (2010) also found that on average, Malaysian unit trust which experienced productivity regress were likely due to technological regress. Therefore, it is important to investigate on the reasons for this technological regress which have adverse impact on Malaysian REIT productivity.

One possible reason for this technological regress is likely due to the income distribution requirement Topuz (2002). Under the Malaysian REIT guideline (Securities Commission Malaysia, 2012), REIT managers need to distribute 90% of their taxable income and therefore could not retain their earning and reinvest their income for the following year. Since the funding for purchasing new assets are lacking, the managers need to have access to external capital. Raising the fund through debt and equity are costly than the retained earnings, resulting to a higher cost of capital. This higher cost of capital might be the reason for the technological regress throughout the studied period. Further investigation into the input revealed that the increase in total expenses are likely due to the managers controllable expenses (the combination of the administrative/ management and property operating expenses) rather than the market driven expenses (interest expenses). The findings validate earlier efficiency results when the dominant sources for technical inefficiency are due to pure technical inefficiency (managerial inefficiency).

Table 4: Developments in the number of M-REITs with productivity gain (loss) or efficiency increase (decrease) [i]

Period	Productivity change (%) (TFPCH)			Technology change (%) (TECHCH)			Efficiency change (%) (EFFCH)			Pure efficiency change (%) (PECH)			Scale efficiency change (%) (SECH)		
	Growth	Loss	No Δ	Prgrs	Rgrss	No Δ	Inc.	Dec.	No Δ	Inc.	Dec.	No Δ	Inc.	Dec.	No Δ
2007-2008	10	90	0	0	100	0	80	10	10	60	10	30	40	50	10
2008-2009	63.64	36.36	0	27.27	72.73	0	63.64	9.09	27.27	45.45	9.09	45.45	45.45	27.27	27.27
2009-2010	27.27	72.73	0	0	100	0	90.91	9.09	0	54.55	9.09	36.36	90.91	9.09	0
2010-2011	53.85	46.15	0	69.23	30.77	0	30.77	53.85	15.38	7.69	53.85	38.46	53.85	30.77	15.38
2011-2012	20	80	0	0	100	0	86.67	6.67	6.67	60	6.67	33.33	80	13.33	6.67
2012-2013	40	60	0	6.67	93.33	0	66.67	6.67	26.67	60	0	40	60	13.33	26.67
2013-2014	43.75	56.25	0	0	100	0	81.25	0	18.75	68.75	0	31.25	81.25	0	18.75
2014-2015	50	50	0	75	25	0	18.75	62.5	18.75	18.75	43.75	37.5	25	56.25	18.75
Mean															
2007-2009	36.82	63.18	0	13.64	86.37	0	71.82	9.55	18.64	52.73	9.55	37.73	42.73	38.64	18.64
2010-2015	39.15	60.86	0	25.15	74.85	0	62.50	23.13	14.37	44.96	18.89	36.15	65.17	20.46	14.37
2007-2015	38.56	61.44	0	22.27	77.73	0	64.83	19.73	15.44	46.90	16.56	36.54	59.56	25.01	15.44

Table 5: Sources of productivity of M-REITs [ii]

	Productivity growth (%) mainly due to:		Productivity loss (%) mainly due to		No Prod. (%) Δ	Efficiency increase (%) mainly due to:		Efficiency decrease (%) mainly due to:		No Eff (%) Δ
	Eff. Inc.	Tech. Progress	Eff. Decr.	Tech. Regress		PTE Incr.	SE Inc.	PTE Decr.	SE Decr.	
2007-2008	10.00	0.00	0.00	90.00	0	60.00	20.00	0.00	10.00	10.00
2008-2009	45.45	18.18	9.09	27.27	0	45.45	18.18	9.09	0.00	27.27
2009-2010	27.27	0.00	0.00	72.73	0	18.18	72.73	0.00	9.09	0.00
2010-2011	15.38	38.46	30.77	15.38	0	0.00	30.77	23.08	30.77	15.38
2011-2012	20.00	0.00	0.00	80.00	0	33.33	53.33	0.00	6.67	6.67
2012-2013	33.33	6.67	0.00	60.00	0	53.33	13.33	0.00	6.67	26.67
2013-2014	43.75	0.00	0.00	56.25	0	50.00	31.25	0.00	0.00	18.75
2014-2015	12.50	37.50	43.75	6.25	0	12.50	6.25	31.25	31.25	18.75
Mean										
2007-2009	27.73	9.09	4.55	58.64	0	52.73	19.09	4.55	5.00	18.64
2010-2015	25.37	13.77	12.42	48.44	0	27.89	34.61	9.05	14.07	14.37
2007-2015	25.96	12.60	10.45	50.99	0	34.10	30.73	7.93	11.81	15.44

CONCLUSION

This study discusses productivity changes for the M-REITs using a non-parametric approach of Malmquist Productivity Index (MPI) of Data Envelopment Analysis (MPI-DEA) between 2007 and 2015. The methodology has allowed us to isolate the efforts to catch up to the frontier (EFFCH) from the frontier shift (TECHCH). Furthermore, Malmquist index has enabled us to explore the sources of efficiency change, whether there is a need in improvements in management practice (PECH) or improvement towards optimal size (SECH). Our study was confined to Malaysian REITs listed in Bursa Malaysia between 2007 to 2015. This paper also aimed to fill a gap in the real estate efficiency and productivity through the establishment of recent evidence on the productivity changes of M-REITs. Our results suggested that the impact of the global financial crisis on the productivity, technology and efficiency of the M-REITs was dramatic. On average, M-REIT industry faced an 18.85% productivity loss, comprising 36.25% of technological regress and 30.85% of efficiency increase during 2007-2009 period, implying that the major source of productivity decline was shock to the REIT industry technology rather than an increase in efficiency.

On average, the M-REIT industry has faced 14.91% of productivity regress during 2007-2015 period, comprising 49.90% of efficiency increase and 33.40% technological regress. These decomposition of the productivity change index suggest that Malaysian REIT productivity changes were mainly due to efficiency change rather than technological change. One possible reason for this technological regress is likely due to the income distribution requirement in which the REIT managers could not retain their earning and reinvest their income for the following year. Since the funding for purchasing new assets are lacking, the REIT managers need to have access to external capital. Raising the fund through debt and equity are costly than the retained earnings, resulting in a higher cost of capital.

We have also explored the sources of efficiency change when the results indicate that the main sources for efficiency change is likely due to management practice (pure technical efficiency change). This establishes the need for improvement in management practice rather than scale adjustment.

Empirical findings from this study provide insight for the policy maker in attaining the optimum utilisation of resources, improvement in managerial skills and the optimum scale of operation for M-REITs. This helps to establish the need to facilitate sustainable competitiveness of M-REIT operations in the future. Moving forward, it is reasonable to expect that regulatory policy measures will be geared towards enhancing the efficiency and productivity of REIT operating in the Malaysian real estate investment industry, with the aim of intensifying the robustness and growth of the industry. A different approach to measuring REIT efficiency and productivity over a longer period for M-REITs will produce a more robust result. This includes estimating the efficiency and

productivity using the bootstrap DEA and parametric approach, which falls outside the scope of the current study.

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[i] M-REITs are classified into the following categories: Productivity growth: TFPCH>1, productivity loss: TFPCH<1, productivity stagnant: TFPCH=1, Technological progress: TECHCH >1, Technological regress TECHCH<1, Technological stagnant TECHCH=1, technical, pure technical and scale efficiency increase: EFFCH, PECH, SECH >1, technical, pure technical and scale efficiency decrease: EFFCH, PECH, SECH <1, No change in technical, pure technical and scale efficiency: EFFCH, PECH, SECH=1.

[ii] M-REITs are classified into the following categories: Productivity growth due to technological progress (efficiency increase): TFPCH>1 and TECHCH>1 and EFFCH (TFPCH>1, and EFFCH>1 and TECHCH); productivity loss due to technological regress (efficiency decrease): TFPCH<1, TECHCH<1 and EFFCH (TFPCH<1, and EFFCH<1 and TECHCH); efficiency increase due to PTE increase (SE increase); EFFCH>1 and PECH >1 and SECH (EFFCH>1 and SECH>1 and PECH; Efficiency decrease due to PTE decrease (SE decrease): EFFCH<1, and PECH<1 and SECH (EFFCH<1, and SECH <1 and PECH).

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BRIDGING THE SUPPLY AND DEMAND GAP FOR AFFORDABLE HOME OWNERSHIP IN MALAYSIA: THE ROLES OF GOVERNMENT AND FINANCIAL INSTITUTIONS

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Abstract

Promoting homeownership remains a conundrum in a developing economy in Malaysia. Despite significant initiatives pursued by the government, more needs to be done to promote affordable and sustainable homeownership further. Khazanah Report (2018) provides evidence that housing affordability in Malaysia is worsening compared to one reported in 2015.This study therefore aims to empirically assess the role of government in terms of designing policies to promote the supply of affordable homes and the role of financial institutions in terms of providing home financing. The finding reveals that existing housing policies and government programmes have a significant role in promoting homeownership. The finding further suggests that building and completing more units of affordable homes (as captured by housing stocks) and promoting innovative home financing products (both conventional and Islamic) are the most significant variables in promoting homeownership in Malaysia.

Keywords: Malaysia, homeownership, government housing effort, affordable homes, home financing

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INTRODUCTION

Promoting affordable homes has always been a daunting task for the government. Coupled with volatilities in the exchange rate, fuel prices and uncertainties in economic fundamental have further challenged the government and other concerned institutions to find appropriate measures and solutions in providing more affordable homes to house the nation.

Despite many efforts taken by the government in the past years, the Malaysian residential housing market is still regarded as unaffordable. A study by Khazanah Research Institute Report (KRI) in 2018 found that the overall Malaysian median-multiple worsens with 5.0 affordability index compared to 4.4 (in 2015) reflecting many Malaysians continue to be locked out of the housing market. In addition, KRI (2015) also reported a mismatch between supply of and demand for affordable homes in Malaysian urban areas which is due to socioeconomic changes, urbanization, and evolving population structures. Bank Negara Malaysia (BNM) reported that in 2017, the supply of affordable homes (RM250,000 or below) is only 20 percent of new Malaysian housing launched in the first quarter of 2017 compared to 33 percent between 2010 to 2014. It is also reported that affordability and mobility elements are causing an increase in demand for housing and at the same time recording an inadequate supply of affordable housing. These challenges further escalate as the house prices continue an increasing trend partly due to the increase in land prices and higher construction costs. To further address the issue of mismatch between demand and supply of affordable houses, the government continues to design policies that will further promote more affordable homes. To this effect, understanding the demand of homeownership affordability and its determinants particularly the government policy variables and institutional variable will shed some light on which particular variables to focus on to promote affordability of homeownership.

Realising the need for a high standard and sustainable housing programme for dynamic socioeconomic development in Malaysia, the 10th Malaysia Economic Plan, and 11th Malaysia Economic Plan were designed. The economic plan acted as a guideline to strategize and to design fitting policies in assuring adequate shelter with quality living environment for the public. The government has worked closely with the financial institutions to provide surety on 100% financing to potential borrowers. Apart from financial institutions in Malaysia, Employees Provident Fund (EPF), National Mortgage Corporation (CAGAMAS) and several other government agencies also play their roles to impact housing delivery processes. Several housing programmes were also introduced such as My First Home Scheme, Youth Housing Scheme, and MyHome, with the aim to further promote affordable homeownership in Malaysia.

Against this backdrop, this study attempts to investigate whether there exists a significant relationship between the supply factor derived from

government's policy (such as housing stocks and land supply) and institutional supply of funds (measured by financing offered by financial institutions) and homeownership in Malaysia. A significant relationship between the government policy variables (measured by supply factor derived from the government policies) and institutional supply factor (measured by amount of financing offered) suggests that government policies and financial institutions can play effective roles to promote home affordability in Malaysia.

LITERATURE REVIEW

Housing plays an important role in enhancing the wellbeing of the society in terms of contributing to the physical and mental health, education, employment and security outcomes; a failure to achieve that will lead to housing stress (Baqutaya, Ariffin, & Raji, 2016). Existing literature describes housing as a social policy tool (Rowley & Ong, 2012) and suggest how policy tool should be able to contribute towards shelter and non-shelter outcomes such as health, crime, employment and education (Phibbs & Young, 2005). Therefore, designing public policy has become increasingly crucial as it demands provision of public housing, updating new policy development as well as guiding directions for future policies. As for Malaysia, housing policies have been adopting a pragmatic and inclusive role of the government by providing institutional support for a well functional housing delivery (Abdullahi et al., 2011).

For the past few years, Malaysia has experienced increasing demand for affordable homes especially from the middle income group (MIG) and low income group (LIG). This trend is consistent with the growing concern that LIG and the poor are being at disadvantaged as a result of the implementation of housing policy in developing countries (Abdullahi et al., 2011). The Malaysian government has introduced many new policies where developers and the government work together, responsive to the demands imposed upon the industry, concertedly to further promote supply of more affordable homes. Policy and regulatory changes by the government must be embraced because intervention by government in the competitive housing development industry is essential. Baqutaya et al. (2016) and Osman, Yusop, Shuid and Abdullah (2017) suggest that house price, home financing and housing schemes' policy are determinants that significantly affect affordability in property owning and enhancement of the living quality in Malaysia. Therefore, to promote affordable homeownership requires a great deal of policy attention in order to enhance homeownership for a better wellbeing and quality living.

The choice of banks also influences the chances of getting house financing. Amin (2008) studies the choice criteria for Islamic home financing in Labuan, Malaysia. His finding suggests that with Islamic home financing, borrowers pay lower monthly instalments, greater transparency in practices and 100 percent financing which fulfils the first five criteria that influence the

decision of a house buyer. Similarly, Hamid and Masood (2011) assert that customers in Pakistan choose efficient services, price, bank reputation and product flexibility as among the important factors considered in choosing Islamic mortgages. For the Islamic home financing in Malaysia, the institutions have established innovative products to support the government's efforts to promote homeownership further. Thirteen (13) out of 23 products offered by Islamic banks are based on the *shariah* principles of *Murabahah*, which includes *Bai Bithaman Ajil* and *Tawarruq*, and six out of the total products are based on *Mushrakah Mutanaqisah*. Meanwhile, the less popular contracts are *Ijarah* and *Istisna'a* (BNM, 2016)

RESEARCH METHODOLOGY

To assess the roles of government's efforts and Islamic financial institutions in promoting home affordability in Malaysia, we adopt variance decompositions (VDC) and impulse response functions (IRF) to empirically explore the impact of shocks in each selected independent variable on homeownership.

Figure 1 illustrates the research framework where the dependent variable of homeownership is measured by the number of homeownership transferred to Malaysian citizens. Whereas, the independent variables include government efforts, represented by the existing residential stocks unit and land supply for building development, and both Islamic home financing and conventional home financing represented by total Islamic home financing approved for real estate sector. House price index (HPI) and gross domestic products (GDP) are the control variables. The summary of the measurement of the variables is illustrated in Table 1.

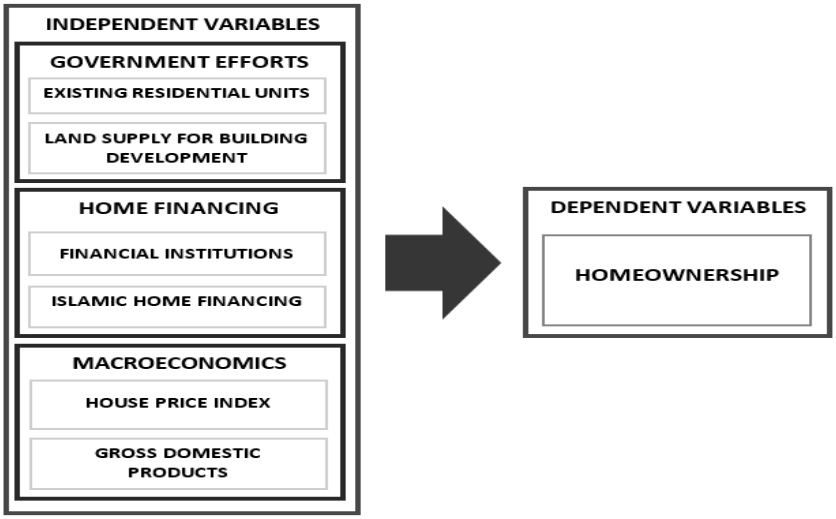

Figure 1: Research framework

Table 1: Measurement of variables

Variables	Measurement	Period	Sources
Homeownership	Number of homeownership transferred	Quarter One 2008 to Quarter Four 2015	National Property Information Centre (NAPIC)
Existing Residential Stock	Number of launched and built units		
Land Supply	Hectares of land approved for building		
Housing Price Index	Malaysia house price index (base year 2010)		Dept. of Statistics Malaysia (DOSM)
Gross Domestic Products	Malaysian GDP (base year 2010)		Economic Planning Unit (EPU)
Financial Institutions	Total home financing approved for real estate by all banks in Malaysia		Bank Negara Malaysia (BNM)
Islamic Funding	Home financing approved for real estate by Malaysia Islamic banks		

Increasing demand for affordable homes could cause additional years to elapse before the required supply is available due to shortages in supply of construction materials or waiting for improved components (Costello, 2014; Gu, Michael, & Cheng, 2015). The supply of housing stocks will always deviate from equilibrium and once the supply is not at the right place and at the right time, the housing planning policy may disrupt the balance between supply and demand in the housing market (Baer & Kauw, 2016). Yet, real estate boom is still a reason that is affecting people's decision to own a house and oversupply or shortages of properties is a separate issue (Phang & Helble, 2016). Apart from demand and supply, preference to newly launched and built units (in particular, existing residential stock units) is expected to react positively and significantly with homeownership (Poon & Garrat, 2012).

Land markets exert an outstanding influence over the different socioeconomic strata to homeownership on urban land with varying quality (Baer & Kauw, 2016) and at the same time hindered by land use policy (Ayoade & Ahmed, 2014) as housing supply is affected by land supply (Gu et al., 2015). Locations with the best facilities and green environment offer more dynamic environment compared to those that lack a minimum of urban-environmental standards (Lee, 2009; Zainal, Kaur, Ahmad, & Khalili, 2012; Malik & Wahid, 2014). The significant relationship between land price, the dynamics of land supply, land tenure and the allocation of land (i.e. land market), determine the influence on urban structuring and the general functioning of a city (Kasanga, 1995; Hui, 2004; Adam, 2015; Irumba, 2015). We therefore postulate that there is a significant positive relationship between total land supply and

homeownership. In this study, the role of financial institutions is measured by the total amount approved for home financing and is expected to have a positive relationship with homeownership (Barakova, Bostic, Calem, & Wachter, 2003).

The mortgage rate is the most important factor which significantly influences the decision to own a home (Claussen, 2013; Ismail, Bujang, Jiram, Zarin, & Jaafar, 2015; Kajuth, Knetsch, & Pinkwart, 2016). Avoiding interest-rate as a benchmark for product pricing (Mohammad & Gauri, 2015), simple favourable regulatory and tax changes for homeowners offered by the government, and support for more banks to offer Islamic home financing products (Smolo & Hassan, 2011) have managed to attract more individuals to purchase a home.

Meanwhile, the attractive regulations on the home purchase plan and varieties of Islamic banking products could increase customers' confidence in Islamic mortgage products compared to the conventional products (Meera & Abdul-Razak, 2005; Tameme & Asutay, 2012; Usman & Lizam, 2016). The government could play a more effective role in increasing homeownership rates by raising the awareness of innovative and alternative Islamic home financing among the Muslim community (Ibhler & Lucius, 2003; Oyewole, 2010; Smolo & Hassan, 2011).

Increase in house prices can directly push the demand for homeownership downwards since a greater amount of capital borrowing will be required to acquire affordable homes (Phang, 2010) and small changes in liquidity fully impact house prices in one direction (Taltavull & White, 2016). In addition, the sentiment to wait and see for a reduced price in future (Shiller, 2007; Lee, 2009) and the low nett worth buyers will have less creditworthiness to obtain higher financing from banks and expect low interest rates packages (Kajuth et al., 2016). Interest rate is regarded as the cost of borrowing and in this present study it is expected that it will be negatively related to homeownership.

In the same vein, Udechukwu (2008) and Claussen (2013) state that an increase in household disposable income is a significant factor behind economic empowerment which influences homeownership decision positively. Ageing population (Phang & Helble, 2016) with high unemployment rates (Kagochi & Mace, 2009) would rather avoid homeownership and rely more on their internal sources, to finance their normal consumption and investment needs.

The model of this study incorporates existing residential stock units and land supply into the analysis in order to evaluate the government efforts in promoting homeownership. In order to evaluate Islamic and conventional home financing in promoting ownership, the data on Islamic home financing approved and conventional home financing approved are utilised. However, consistent with Kassim, Majid and Yusof (2009), this study does not incorporate all the variables in a single model so that we can make a meaningful comparison between the effects of government efforts, financial institutions and Islamic home financing

on homeownership. Table 2 summarizes the time series analysis techniques used in this study in corresponding to the research objectives.

Table 2: Research objectives and time series analysis techniques

Research Objective	Time Series Analysis Techniques
1. To examine whether there is a long-run relationship between the level of homeownership of Malaysian citizens and government efforts, total financing and Islamic home financing.	Johansen Co-integration Approach (Long-run analysis)
2. To identify whether there is significant impact of changes in government efforts, total financing and Islamic home financing on homeownership in the short-run.	Impulse Response Function (IRF) (Short-run) and Forecast Error of Variance Decomposition (FEVD)

Notes: All series, except for HPI, are transformed into natural logarithms.

The equation for Least Squares at First Difference model used in this study is expressed in the Appendix 1.

RESEARCH FINDINGS AND ANALYSIS

We start our analysis by presenting the descriptive statistics of common sample for homeownership in Malaysia for 2008-2015. In Table 3, all variables show small standard deviation except for Islamic home financing variable which shows the highest deviation at 0.71. The set of data further reveals peaked positive value of kurtosis which means the value of the kurtosis are mostly reflecting normal distribution with values more than 0 but less than 3. Only Islamic and total home financing exceeds slightly more than 3.0. Generally these results indicate that the data is normally distributed.

Table 3: Descriptive state of common sample

	lnHOT	lnESU	lnLSS	HPI	lnGDP	lnHFI	lnHFT
Mean	11.000	10.143	8.213	5.118	8.935	8.356	10.022
Median	11.004	10.050	8.220	5.102	8.927	8.632	10.077
Maximum	11.208	10.940	8.685	5.440	9.101	9.112	10.404
Minimum	10.744	9.468	7.479	4.857	8.757	6.628	9.365
Std. Dev.	0.111	0.411	0.391	0.203	0.085	0.707	0.278
Skewness	-0.217	0.412	-0.443	0.143	0.068	-1.094	-0.739
Kurtosis	2.840	2.322	2.258	1.555	2.302	3.228	3.135
Jarque-Bera	0.286	1.519	1.781	2.894	0.675	6.452	2.934
Probability	0.867	0.468	0.410	0.235	0.714	0.040	0.231

Sum	351.999	324.581	262.811	163.786	285.915	267.408	320.708
Sum Sq. Dev.	0.382	5.235	4.736	1.274	0.222	15.497	2.388
Observations	32	32	32	32	32	32	32

Table 4 presents correlation analysis results for the sample period. The results indicate a high correlation between GDP and House Price Index. This result concurs with existing studies conducted on Asian Housing Market that shows a strong positive correlation between GDP and HPI (Piazzesi & Schneider, 2009; Zhu, 2006). There exists a strong positive correlation between HPI and HFI which indicates that Islamic home financing are generally asset based and thus more linked to price of the asset compared to the financing of the conventional banks.

Table 4: Summary of data correlation analysis

Correlation	lnHOT	lnESU	lnLSS	HPI	lnGDP	lnHFI	lnHFT
lnESU	-0.453	1.000					
lnLSS	-0.039	0.378	1.000				
HPI	0.380	-0.294	-0.417	1.000			
lnGDP	0.489	-0.448	-0.312	0.930	1.000		
lnHFI	0.549	-0.443	-0.445	0.829	0.768	1.00	
lnHFT	0.616	-0.467	-0.249	0.7740	0.783	0.8827	1.000

Table 5 further provides evidence that at 10% significance level, the ADF unit root test for all variables (HOT, ESU, LSS, HPI, GDP, HFT and HFI) are all stationary at first differenced I(1). These results enable us to proceed with the cointegration test.

Table 5: Summary of augmented Dickey-Fuller unit root tests

Variables	At Level		At 1st Difference		Results at 10%
	Intercept	Trend and Intercept	Intercept	Trend and Intercept	
Homeownership	-2.749*	-2.725	-7.291***	-4.838***	I(1)
Residential Stocks	-2.672*	-2.765	-7.070***	-6.871***	I(1)
Land Supply	-4.597***	-6.413***	-8.319***	-7.936***	I(1)
House Price Index	2.214**i*	-3.852***i*	-4.161****i*	-4.935****i*	I(1)
Gross Domestic Products	0.258	-5.593***	-5.006***	-4.728***	I(1)
Islamic Home Financing	-4.262***	-1.221	-0.790	-5.851***	I(1)
Conventional Home Financing	-3.635***	-2.120	-2.035	-9.090****i*	I(1)
Null Hypothesis exist: There is unit root.					

*** - at 1 percent significance level
** - at 5 percent significance level
* - at 10 percent significance level
i - Based on Phillips and Perron (PP) test

To unravel the long run dynamics between home ownership and the explanatory variables such as government efforts, financial institutions and Islamic home financing, we proceed with Augmented Dickey Fuller and Johansen Cointegration tests. Table 6 and Table 7 present the cointegration test results based on the two afore mentioned tests respectively.

Table 6: Augmented Dickey-Fuller tests

Endogenous variable	Exogenous variable	Augmented Dickey-Fuller test
Homeownership (LgHOT)	Housing Supply (LgESU)	-6.872***
Homeownership (LgHOT)	Land Supply (LgLSS)	-7.936***
Homeownership (LgHOT)	Housing Price (LgHPI)	-4.935***i
Homeownership (LgHOT)	Household Income (LgGDP)	-4.728***
Homeownership (LgHOT)	Islamic Financing (LgHFI)	-5.851***
Homeownership (LgHOT)	Conventional Financing (LgHFC)	-9.090709***i
Note: *** $p < 0.01$		

Table 7: Johansen cointegration results

Series	lnESU	lnLSS	HPI	lnGDP	lnHFI	lnHFC
lnHOT lnESU lnLSS HPI lnGDP	0.242460 (0.21194)	0.025971 (0.16492)	0.028671 (0.00572)	-13.49778 (2.36795)		
lnHOT lnESU lnLSS HPI lnGDP lnHFI	-0.148589 (0.06687)	0.010702 (0.04502)	0.020625 (0.00221)	-8.850561 (0.89587)	-0.192125 (0.03906)	
lnHOT lnESU lnLSS HPI lnGDP lnHFC	0.104447 (0.10288)	-0.163381 (0.07464)	-0.008661 (0.00290)	4.953256 (1.29749)		0.248419 (0.17539)

Tables 8, 9 and 10 further indicate that there exists a significant long run relationship between government efforts, financial institutions and Islamic home financing and home ownership in Malaysia. These results lend support to studies across countries on the effects of land supply and housing stocks on homeownership in Hong Kong and China (Lee, 2009; Hui, 2004), Ethiopia (Adam, 2015); UK, Australia, Ukraine (Ayoade & Ahmad, 2014; Costello, 2014; Kryvobokov, 2004). Furthermore, our findings that there exists a long run relationship between financial institutions and homeownership concur with the results of Garriga, Gavin and Schalgenhauf (2006), which also allude that innovations in financial markets, access to mortgage finance and reducing payment constraints can allow consumers to purchase homes. The results on Islamic home financing affecting the homeownership in Malaysia also augurs well with the study of Usman and Lizam (2016) for Nigeria, which reveal that religious perception controls the buyers intention of using mortgage in financing homeownership. At this juncture, we can also conclude that concerted efforts among government, financial institutions and Islamic home financing can further promote homeownership in Malaysia.

Table 8: Hypotheses and findings

Variables	Hypotheses	Long-run Analysis
Homeownership and Existing Residential Stocks	H1: There is a relationship between number of existing stocks and Homeownership	Accept H1
Homeownership and Land Supply	H2: There is a relationship between total land supply and Homeownership	Accept H2

Table 9: Hypotheses and findings of the study – financial institutions

Variables	Hypotheses	Long-run Analysis
Homeownership and Islamic Home Financing	H3: There is a relationship between total financing and Homeownership.	Accept H3

Table 10: Hypotheses and findings of the study – Islamic home financing

Variables	Hypotheses	Long-run Analysis
Homeownership and Islamic Financing	H4: There is a relationship between Islamic home financing and Homeownership.	Accept H4

Meanwhile, as highlighted in Tables 11 and 12, similarly for Islamic Home Financing (HFI), shocks in homeownership that is attributable to shocks in HFI accounts for about 4-5 percent and this also represents a significant amount compared to the other variables. We can thus conclude that for financial institutions and Islamic home financing also promote homeownership in both short run and long run. These findings lend support that government policies

effecting land supply and housing supply coupled with increased financing to real estate sector by financial institutions (both total financing and financing offered by Islamic banks) can further promote home ownership in Malaysia.

Table 11: Variance decomposition of homeownership

Period	S.E.	DHOT	DGDP	DHFI	DHPI	DESU	DLSS
1	0.105	100.00	0.000	0.000	0.000	0.000	0.000
2	0.115	94.642	2.522	0.204	0.122	0.029	2.477
3	0.118	89.526	2.530	1.837	3.229	0.519	2.355
4	0.120	86.933	2.553	2.044	4.788	1.026	2.653
5	0.121	86.431	3.035	2.017	4.756	1.142	2.616
6	0.121	86.041	3.060	2.290	4.764	1.172	2.670
7	0.122	85.821	3.101	2.331	4.809	1.187	2.749
8	0.122	85.77	3.128	2.329	4.810	1.190	2.768
9	0.122	85.665	3.190	2.376	4.7992	1.192	2.775
10	0.122	85.613	3.188	2.414	4.811	1.197	2.774
Cholesky Ordering no 1: DHOT DGDP DHFI DHPI DESU DLSS							

Table 12: Variance decomposition of homeownership

Period	S.E.	DHOT	DGDP	DHPI	DHFI	DESU	DLSS
1	0.105	100.00	0.000	0.000	0.000	0.000	0.000
2	0.115	94.642	2.522	0.0196	0.307	0.0297	2.477
3	0.118	89.526	2.530	1.241	3.825	0.519	2.355
4	0.120	86.933	2.553	3.119	3.713	1.026	2.653
5	0.123	86.431	3.035	3.098	3.675	1.142	2.616
6	0.121	86.041	3.060	3.087	3.967	1.172	2.670
7	0.122	85.821	3.101	3.097	4.043	1.187	2.749
8	0.122	85.77	3.128	3.107	4.032	1.190	2.768
9	0.122	85.66	3.190	3.106	4.068	1.1924	2.775
10	0.122	85.613	3.188	3.105	4.119	1.197	2.774
Cholesky Ordering no 2: DHOT DGDP DHPI DHFI DESU DLSS							

We further extend our analysis by examining the effects of a shock in the dependent variable that is attributable to shocks in the explanatory variables i.e. government efforts, financial institutions and Islamic home financing in the short run. Based on Tables 13 and 14, With HFT (Total Financing Model which comprises financing offered by both Conventional and Islamic banks) model, in the short run, GDP and HFT account for around 8 percent and 7 to 10 percent of forecast error variance of Homeownership respectively for both orderings. This result suggests that financial institutions play a more significant role in promoting

home ownership in the short run. This result augurs well with the results of existing studies like Painter and Redfearn (2002), Garriga et al. (2006), Claussen (2013) and Ismail et al. (2015), which assert the importance offered by financial institutions to promote home ownership.

Table 13: Variance decomposition of homeownership

Period	S.E.	DHOT	DGDP	DHFT	DHPI	DESU	DLSS
1	0.098	100.000	0.000	0.000	0.000	0.000	0.000
2	0.107	93.986	4.999	0.131	0.012	0.231	0.642
3	0.113	85.529	4.708	8.586	0.188	0.219	0.770
4	0.115	83.347	4.667	9.275	0.311	1.651	0.748
5	0.118	79.724	6.445	10.197	0.928	1.675	1.031
6	0.119	77.973	7.436	10.065	1.236	2.123	1.168
7	0.120	77.254	7.453	10.019	1.456	2.280	1.537
8	0.121	77.216	7.365	10.060	1.439	2.293	1.626
9	0.122	76.121	8.079	10.115	1.534	2.503	1.648
10	0.122	75.702	8.422	10.070	1.558	2.581	1.667
Cholesky Ordering no 1: DHOT DGDP DHFT DHPI DESU DLSS							

Table 14: Variance decomposition of homeownership

Period	S.E.	DHOT	DGDP	DHFT	DHPI	DESU	DLSS
1	0.098	100.000	0.000	0.000	0.000	0.000	0.000
2	0.107	93.986	4.999	0.002	0.141	0.231	0.642
3	0.113	85.529	4.708	2.313	6.461	0.219	0.770
4	0.115	83.347	4.667	2.751	6.835	1.651	0.748
5	0.118	79.724	6.445	4.025	7.100	1.675	1.031
6	0.119	77.973	7.436	4.392	6.909	2.123	1.168
7	0.120	77.254	7.453	4.478	6.997	2.280	1.537
8	0.121	77.216	7.365	4.467	7.032	2.293	1.626
9	0.122	76.121	8.079	4.647	7.002	2.503	1.648
10	0.122	75.702	8.422	4.636	6.992	2.581	1.667
Cholesky Ordering no 1: DHOT DGDP DHFT DHPI DESU DLSS							

CONCLUSION

This paper highlights the role of government efforts through policy intervention for land supply and policies on existing supply stocks to promote homeownership in Malaysia. Given the importance of owning a home which extends beyond 'having a roof over the head' as it also affects the wellbeing of the family members with repercussions on societal and economic factors, the study seeks to investigate whether the government's efforts in bridging the demand and supply

gap to promote homeownership is to a certain extent successful. The findings of this study provide evidence that government efforts, financial institutions and macroeconomic fundamentals all play significant roles in promoting homeownership in Malaysia. Thus, concerted efforts among industry players and policymakers and the macroeconomic indicators must be maintained to promote homeownership further. Our short-run dynamics on the other hand, suggest that income as measured by GDP and total financing by Financial Institutions and Islamic Home Financing are three significant variables that affect homeownership in the short run. These results further confirm the existing theories on homeownership affordability which identify income and financing from financial institutions are the two most significant factors to promote homeownership in Malaysia. Policy ramifications for the government of Malaysia to promote homeownership affordability should therefore focus on increasing income and supporting financial institutions to provide financing can further promote homeownership in Malaysia.

The results of this study also hope to benefit the home buyers to be better informed on the government initiatives and the role of financial institutions. Homebuyers will also have a better understanding before making a decision to buy a house. For the financial institutions, understanding the impact of home financing will enable them to design innovative and promotional packages for the home buyers. For the government and policymakers, understanding the measures undertaken thus far and their role in bridging the gap between the supply and demand will enable them to review existing and design future policies to promote homeownership in Malaysia further.

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Appendix 1

Evaluating Government Effort in promoting homeownership:

$$\Delta HOT_t = \propto_0 + \propto_2 \Delta HPI + \propto_3 \Delta GDP + \propto_4 \Delta ESU + \propto_5 \Delta LSS \quad (1)$$

Evaluating Government Effort and Total Financing in promoting homeownership:

$$\Delta HOT_t = \propto_0 + \propto_2 \Delta HPI + \propto_3 \Delta GDP + \propto_4 \Delta ESU + \propto_5 \Delta LSS + \propto_6 \Delta HFT \quad (2)$$

Evaluating Government Effort and Islamic Home Financing in promoting homeownership:

$$\Delta HOT_t = \propto_0 + \propto_2 \Delta HPI + \propto_3 \Delta GDP + \propto_4 \Delta ESU + \propto_5 \Delta LSS + \propto_6 \Delta HFI \quad (3)$$

Where;

HOT = Homeownership Transferred

Government Effort:

ESU = Existing Residential Stocks
LSS = Hectares of Land Supply for Building Development

Home Financing:

HFI = Islamic Home Financing Approved
HFT = Total Home Financing Approved

Macroeconomic Variables:

HPI = Housing Price Index
GDP = Gross Domestic Products

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ZAKAT HOUSES DESIGN AND PLANNING (QUALITY AND STANDARD) FROM *SHARIAH* PERSPECTIVE

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Abstract

The paper focusses on the provision of shelter or housing for *asnaf fakr* and *miskin* by *zakat* administrators in Malaysia. The objectives of the study are to ascertain whether the design and planning (quality & standard) of zakat housing (1) satisfies the need and well-being of the households (i.e. the *asnaf*s) in terms of appropriateness and adequacy, (2) meets the requirement of *shariah* **(**aesthetic, privacy, space requirements, facilities and amenities) and (3) could potential arrive at the key success factors for zakat houses from *shariah* perspectives. The study was carried out through desktop analysis of the literature review of zakat, housing for *asnaf*s and house design for *shariah* added with semi-structured interview of the occupants living in zakat houses. Key findings from the study are the zakat houses occupied by the *asnafs* are neither appropriate nor adequate in terms of meeting the needs and requirements of the households of the *asnafs.* Limited literature is found describing the specifications of zakat houses or the state and conditions of such houses and houses repaired or rented. The study recommends that zakat administrator should consider establishing their own and *shariah* compliant standards for zakat funded housing for the *asnafs*.

Keyword: zakat, design, housing, *shariah*, standard, *asnaf*

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INTRODUCTION

One of the most critical problems currently facing Muslims in Malaysia is believed to be the lack of access to decent and affordable housing for the low and middle income families. The problem, relatively widespread, appears to be more acute among families residing in the cities and big towns due to higher costs of living, in contrast to those residing in the rural areas. Consequently, many of the low and middle income families have to endure staying in cramped and often unfavourable living conditions. In Islam, z*akat* and *waqaf* are two key instruments that focus on providing assistance to the needy. Although approaches of these two instruments are different, they have common aim to provide assistance to the needy Muslims. *Zakat* has specific approach as prescribed in *Al-Quran* and *Al-Hadiths* whereas *waqaf* has no direct *Quranic* injunction except the various verses and hadiths that promote the practice of *infaq*. *Infaq* in Arabic term is spending. Conceptually in the Islamic system, it means giving away for the betterment of the society and its members, including the giver and her/his family.

Available literature thus far suggested that lots have been done in terms of assisting the needy and eligible Muslim families including in the provision of housing via *zakat* and *waqaf* respectively (Khairuddin, Sharina Farihah, Azila, Jamilah, & Srazali, 2015). The various *Majlis Agama Islam Negeri* (MAIN) have been very active in discharging their roles and performing their functions. In effort to boost services and expertise, the government had, in 2004, established the *Jabatan Waqaf, Zakat dan Haji* (JAWHAR) or the Department of *Waqaf, Zakat* and *Hajj*. JAWHAR is provided with administrators and funding to assist MAIN in coming up with methods to improve the administration of the states' *zakat* and *waqaf*.

Focussing on housing for the needy Muslims, zakat administrators in Malaysia do provide housing assistances in their disbursement schemes. The Manual of Zakat Disbursement produced by JAWHAR at the Federal level explicitly stated this kind of assistance under the thirty-two (32) schemes of zakat disbursement. It was acknowledged that foods, clothes, housing, education, transportation, medical are the basic needs of people that require assistance for needy person. However, the practice of housing assistance among MAIN varies. In general, the assistance ranges from (i) New house, (ii) Repair, (iii) Monthly rental, (iv) Deposit for low cost house and (v) Cluster house. According to JAWHAR document, *asnaf faqr*, *miskin* and *muallaf* are eligible for this kind of assistance subject to further investigation from the application form filled up by them. This should be the focus of the study by examining the state of housing for the *asnaf*s provided by zakat administrators.

The observation on *asnaf* cluster house (*perumahan berkelompok*) provided by MAIN appears to be showing that their houses need improvement in term of their design, size, surrounding and location. In Federal Territory Kuala Lumpur, majority of the houses for *asnaf* are located in *Projek Perumahan Rakyat*

(PPR) and *Projek Perumahan Awam* (PPA) under Kuala Lumpur City Hall (KLCH). Thus, the objectives of the study are to ascertain whether the design and planning (quality & standard) of zakat housing (1) satisfies the need and well-being of the households (i.e. the *asnaf*s) in terms of appropriateness and adequacy, (2) meets the requirement of *shariah* **(**aesthetic, privacy, space requirements, facilities and amenities) and (3) could potential arrive at the key success factors for zakat houses from *shariah* perspectives.

Thus, this paper highlights the ideas of a house in Islam, planning requirement and basic house design according to the laws. In this regard, the Federal Territory (Planning) Act 1982 (Act 267), the Uniform Building-by Laws 1984 and Street, Drainage and Building Act 1984 and relevant guidelines on public facilities (GP004-A, JPBD, 2013) are referred. Since there is no published literature to describe the specifications of the *asnaf* houses or the state and conditions of such houses and preliminary findings indicate that PPR houses are occupied by *asnaf*, a field survey of PPR houses has been conducted and presented here as benchmarking to the *asnaf* house that should be provided as *shariah* compliant standards for zakat funded housing for the *asnaf*s.

HOUSE FROM *SHARIAH* PERSPECTIVE

House (shelter) is commonly known as basic necessity to human being. Indeed the *maqasid shariah* (the ultimate aim of Islamic laws), through its five essentials of preservation namely faith, self, intellect, lineage and property, promotes the idea of shelter provision. In this regard, the Arabic term '*maskan*', which also means the house, is derived from an Arabic verb '*sakana*', which means to calm down, to repose, to rest, to become quiet and tranquil, and to feel at ease with. Hence, the words '*sukun*' and '*sakinah*' mean calmness, tranquility, peacefulness, serenity, peace of mind, etc. The house is called '*maskan*' in Arabic because it offers its inhabitants a chance to take a break from the demands and pressure of the outside world and concentrate on physical, mental and even spiritual recuperation. Normally, in this tranquil situation of housing arrangement, human well-being and spirit is built up reflecting preservation of faith, self, intellect, lineage and property. This is clearly stated in Al-Qur'an;

> *And Allah has made for you from your homes a place of rest and made for you from the hides of the animals tents which you find light on your day of travel and your day of encampment; and from their wool, fur and hair is furnishing and enjoyment for a time"*
> (*An-Nahl 16: 80*)

In terms of Islamic jurisprudence (*fiqh*), the organization of family institution, succumbed by housing provision, is mostly governed by *fiqh al-munakahat*. This *fiqh* outlined Islamic principles related to family life such as sacredness of family life, limiting the relationship of sexes outside of the family

circle, protecting, raising and educating children, public health, enjoyment of life and others. In this regard, Ahmad Farid Moustapha (1986) translated them into physical form in the kind of privacy, building heights, building forms, external spaces, architecture and social interactions. These physical environments are the concern of the general Islamic *shariah* principles for what house design should be. Meanwhile *fiqh al-mu'amalat* governs community life in human dealings and commercial transaction in Islam. The physical manifestation can be implemented in neighbourhood, town, city and bigger scale of planning entity. In this regard, the Companion Sa'ad ibn Abi Waqqas had narrated that the Messenger of Allah once said that: *"Four things contribute to happiness are righteous wife, spacious home, righteous neighbour and comfortable means of transport"*. The lessons from this hadith among others are the importance of family institution signified in righteous wife, house design and neighbourhood planning, embodied in spacious home and righteous neighbour respectively, and good transportation mode and traffic circulation in spatial planning. House, as a semi-private social place, is understood from the Quranic verse;

> *My Lord, forgive me and my parents and whoever enters my house a believer and the believing men and believing women. And do not increase the wrongdoers except in destruction.* (*Nuh 71:28*)

The verse implies a concept of visiting our friends for good purposes of *ukhuwwah* (social bondage) as well as inviting people to our house. Thus, it gives rise to the importance of appropriate house design and its surrounding. Fulfilling the objectives of house provision in Islam is an *ibadah*. More importantly, the house as a place for worshipping Allah, as Allah's saying in the Quran (interpretation of the meaning):

> *And We inspired Moosa and his brother (saying): 'Take dwellings for your people in Egypt, and make your dwellings as places for your worship, and perform al-salaah, and give glad tidings to the believers'. (Yoonus:87).*

In a hadith, the Messenger of Allah said: "*Do not turn your houses into graves …*" (Reported by Muslim, 1/539). In another hadith where the Prophet said: *"The likeness of a house in which Allah is remembered and the house in which Allah is not remembered is that of the living and the dead, respectively."*

Many Islamic scholars have laid down few basic criteria regarding houses in Islam. The criterions are based on the concept of Islamic urbanization, where the residential quarter is part of the focus in contemporary urbanism. The emphasis of these criterions is on the relationship between Man-and-The Creator and Man-and-Man and can be divided into seven parts:

a) Privacy – a house must be capable of protecting a family. The importance of observation on the relationship between *non-mahram*;

Islam gives great importance to the fundamental human right to privacy.

And do not spy or backbite each other (Al-Hujurat 49:12)

O you who have believed, do not enter houses other than your own houses until you ascertain welcome and greet their inhabitants (An-Nur 24:27)

b) Cleanliness – waste disposal, drainage system and separation between bathroom from the toilet;
c) Right of neighbours – prevent light or air from entering the openings of the neighbours' house;
d) Specific area for guests – giving respect to the guest;
e) Prohibits from constructing a house which features of extravagance emphasizing wealth, pride opulence or arrogance – scale and context;
f) Facing the *Qiblah* – except toilet bowl; and
g) House should be constructed to the values of Islamic arts.

These criteria were used as guideline in formulating the questionnaire for the semi-structured interview with the targeted respondents (*asnaf*s).

PROJEK PERUMAHAN RAKYAT

Majority of *asnafs* (the recipients of zakat fund assistance) have been reported by MAIWP (2015) reside in the *Projek Perumahan Rakyat* (PPR) housing. PPR housing is the government's initiative, under the Ministry of Urban Well-being, Housing and Local Government (MUWHLG), to relocate squatters and meet the needs of low-income group for housing. Eligibility criteria is set for family with total household monthly income of less than RM2,500.00. The eligible residents under this program can either rent or own the unit.

The type of housing provided under PPR are 18-storey flats (high rise), 5-storey walk-up flats in the major cities and terrace houses in coastal and suburban areas. Based on the published materials, houses under PPR adopt the same specifications of design and planning of Low-Cost Housing set out by the National Housing Standard for Low-Cost Housing flats with floor area of not less than 700 sq ft. The PPR house features 3 bedrooms, 1 living room, 1 kitchen and 2 bathrooms with the provision of basic community facilities of community hall, *musolla*, food stalls, kindergarten, facilities for people-with-disability, children playground with greenery area and garbage house (National Housing Department, 2015).

METHODOLOGY

The study commenced with the review of house design from *shariah* perspective, and the background understanding of the development of PPR housing in Malaysia. The criteria of houses from *shariah* perspective were identified from literature review and used as the basis to examine the existing design specifications of PPR housing occupied by the *asnafs*. A semi-structured questionnaire survey was also developed to gauge the satisfaction level of the occupants. A Likert scale of 1 (least satisfied) to 5 (highly satisfied) was used as measurement to gauge the satisfaction level of the respondents (i.e. *asnafs*). A typical PPR house design was selected and measured during the field survey for quantitative analysis. Findings were derived based on the qualitative and quantitative analysis from the data gathered (observations, interviews and measurements). The methodology adopted would lead to the key findings in the provision of house design and planning (quality and standards) of zakat houses its appropriateness and adequacy from the *shariah* perspective.

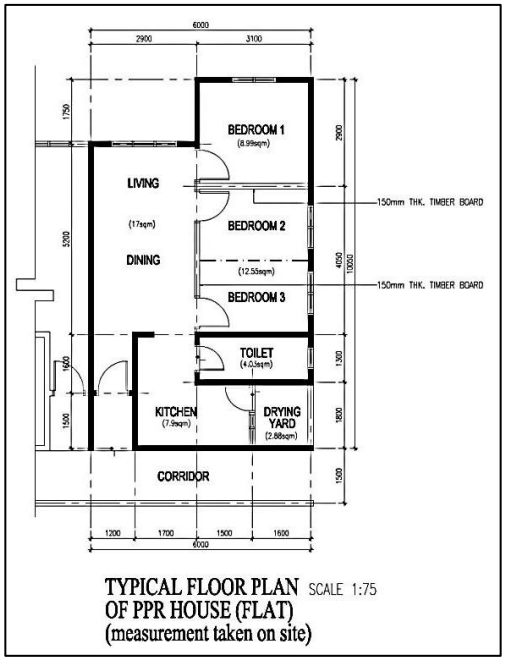
FIELDWORK

The survey was carried out through face-to-face interviews with 47 household heads residing at PPR (80.9%) and PPA (19.1%) within Kuala Lumpur. Majority of the respondents (74.5%) have been living in PPR for more than 6 years, with 21.3% between 6 and 10 years and 53.2% more than 11 years. The residents are the *asnafs*, therefore deemed appropriate as respondents for the study. Questions were formulated to investigate on the basis of two main components: (1) the house condition and (2) the provision of basic facilities as summarised in Table 1.

Table 1: Two components of questions formulated in the questionnaire

Component 1		Component 2	
House condition	Investigation aspects	Provision of basic facilities	Investigation aspects
House space	Living, dining, no. of bedrooms, kitchen, study area, toilet.	Parking, footway, green field, children playground facilities, *musolla*, garbage house, shops, community hall, bus stop, security public telephone, clinic	Availability, distance, accessibility and condition.
House infrastructure	Availability of electricity, water, telephone, internet, and satellite TV.		
Home furniture	Sofa, dining table, fridge, TV, bed, computer.		

A typical floor plan (18-storey flat) of PPR house layout design and planning was drawn as shown in Figure 1, and floor area was measured.



Total Built-up Area (Sqm)		
Living & Dining	=	17.00
Bedroom 1	=	8.99
Bedroom 2 & 3	=	12.55
Toilet	=	4.03
Kitchen	=	7.90
Drying yard	=	2.88
Total	=	53.35 (574 sq. ft.)

Figure 1: A typical floor plan and floor area of PPR House occupied by *asnafs* (18-storey flat)

RESULTS AND FINDINGS

House Condition

There were two types of PPR housing included in the survey, with 78.8% of the respondents residing in the 18-storey house flat and the other 21.2% residing in the 5-storey walk-up flat. The measured built-up area (see Figure 1) for a typical 18 storey flat house of PPR was found to be 53.4sqm (574sqft.), a shortfall of

126sqft from 700sqft of what is required as specified by the National Housing Department (2015).

It has been found that the number of bedrooms provided is only two bedrooms (i.e. bedrooms 2 & 3 were considered one) with 3 doors. The third bedroom was found to be created by the residents and was erected using a partition wall dividing the space (shown as dotted line in Figure 1). This is to fulfil the need of a family for additional room.

Through fieldwork, it has been found that the number of toilets provided is only one, not two as specified by the National Housing Standards for Low-Cost Housing. This is corroborated with the survey result indicating that 95.7% of the respondents confirmed that there is no provision of the third bedroom.

The material used for the bedrooms' wall is timber board. This would not provide good acoustic and privacy comfort level between the most private area of the house (bedrooms) and the social interaction space (living). At the same time, the space for visitors and relatives to perform prayers, particular for female is limited. The respondents also claimed that with the limited space and the existing furniture, the house is not suitable for social interaction as well as gender segregation not complying to *shariah*.

In terms of dilapidation, 53.2% of the respondents indicate that the house condition is deteriorating with 8.5% respondents claim that dilapidated timber window sill and leaking at the concrete floor slab above require repair works. However, 46.8% of the respondents indicate that the house is in perfect condition.

Majority of the respondents felt blessed to be eligible for PPR housing scheme and to have a place for shelter. However, Table 2 shows that respondents who are not satisfied in terms of the house comfort was slightly higher (24.4%) than those who are satisfied (20%).

Table 2: Result of Satisfaction level on house comfort

	Least Satisfied	Not Satisfied	Neutral	Satisfied	Highly Satisfied
	1	2	3	4	5
Overall satisfaction on house comfort	2.2%	22.2%	55.6%	20.0%	0%

Provision of Basic Facilities

The basic facilities provided for the community in PPR housing scheme are: parking space for cars, motorcycles and people-with-disability (PWD), green open space and children playing equipment, *musolla*, nearby schools, mini-shops, public telephone, community hall, garbage house, bus stop and Clinic 1 Malaysia.The provision of Musolla in terms of space, location and accessibility received the highest percentage of agreement (97.9%) from the respondents. Meanwhile, the highest disagreement (95.7%, i.e. 'No') was on parking

sufficiency. The residents also expressed their dissatisfaction that the community hall cannot be used due to the hall poor condition.

DISCUSSIONS

The preliminary finding confirms that there is no design specifications of house for the *asnafs*. The Zakat authorities through MAIN do provide monetary assistance for housing to the *asnafs*. However, this study shows that the house design and its surrounding environment with community facilities are provided based on the Low-Cost Housing scheme specified by the National Housing Department (2015), and not from the Zakat authorities. Thus, their role stops at providing monetary assistance.

The findings of the field survey prove that the living condition and its surrounding environments of the *asnafs* is cramped and poor compared to a modern living environment. Evidences clearly show that while the *asnafs* are very grateful to have shelter in PPR, the house design and planning (quality and standards) meeting *shariah* compliance have to be compromised. Visual and acoustic privacies and gender segregations during social interaction are not achieved with the existing house design experienced.

The minimum number of three (3) bedrooms is not provided and if the additional bedroom is created through partition, the size and space would not comply with the requirement of Building By-Law. The research takes note that the new policy of the new development of PPR housing has set that the minimum number of bedrooms must be three (3).

Complaints made by the respondents on the social decay (drug addicts, poor hygiene among the residents, irresponsible residents etc.) were recorded and evident in PPR housing scheme where the *asnafs* reside.

CONCLUSION AND RECOMMENDATIONS

This paper reports on a study on the provision of zakat houses for *asnaf* from the *shariah* perspectives. On the basis of the study's objectives, the following are the key findings:

a. The present design and planning (quality & standard) of zakat housing provided for *asnaf* do not meet their needs and requirements in terms of appropriateness and adequacy (space, privacy, aesthetic, requirements, facilities and amenities).
b. The study also confirmed that there is no literature to suggest the established specification of zakat houses specifically for the *asnaf*. In this absence, the *asnaf* reside in PPR housing based on the specification of Low-Cost Housing in Malaysia. As a result, many of the *asnafs*' families have to endure staying in cramped and often unfavourable living condition.
c. The key factors influencing the satisfaction of the *asnaf* in the design and planning (quality and standard) of PPR houses are size, space, materials

used, privacy, and safety and security as well as hospitality. As such, these factors could be used as the indicators for Shari'ah Compliance for zakat houses. Hence, it could be concluded that the key success factors in the design and planning (Quality and Standard) for zakat houses from the *shariah* perspectives is to consider these indicators.

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IDENTIFICATION OF MACROECONOMIC FACTORS ON EXCESSIVE RETURNS: A LITERATURE REVIEW

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Abstract

Asian REITs could be considered as one of the fastest growing assets in the world. Japan is currently the biggest market in Asia and Asian REITs market is very much progressing to expand with the emerging of two major regional economies, China and India. Previous studies have proved that Asian REITs are able to show competitive advantage in most of mixed-asset scenarios and have significant roles in improving efficient global REITs portfolio returns. Previous findings also have shown that REITs are able to give remarkable return compare to other asset classes. Similar with other type of portfolio investment, REITs also have high interaction with macroeconomic factors such as inflation and interest rate which represent the economic situation of the countries. The excessive return is used to measure the performance that is affected by the macroeconomic factors by setting a benchmark which will give an added value to the portfolio. Hence, the aim of this research is to review on the literature of the macroeconomic factors on excessive returns Asian REITs.

Keywords: macroeconomic, REITs, Asian, return excessive

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INTRODUCTION

Real Estate Investment Trusts (REITs) is a type of security that allows investors to access and participate in trading in the immovable property market on major exchanges without having to trade in physical assets. They can invest indirectly through companies which have assets and income related to real estate investment, and is qualified as a REIT. The types real estate include residential, industrial, retail, office, hospitality, logistics and any income generating property. REITs have favourable tax treatment, mandated dividends, lower perceived risk profile, offer diversification benefits in a mixed portfolio and have liquidity. This has caused investors to gain interest on REITs.

Unlike other listed real estate firms which commonly resell their real estate assets post-development, REITs acquire and/or develop real estate with the objective of operating them as part their investment portfolio (Kola & Kodongo, 2017). From the beginning of US REITs in 1960, it has expanded widely all over the world including Asia Pacific in the late 1980s and now Asian REITs has become the second largest REIT market globally.

The performance of REITs is measured by the excessive returns which is the revenues obtained after deducting the risks that arise mainly from the macroeconomic factors. The situation of the macroeconomic factors represents the economic health of a country. Therefore, investors should first analyse the macroeconomic factors before making an investment decision as the returns of REITs are affected by them.

RESEARCH BACKGROUND

REITs have become a key component of the listed real estate markets, reaching a total market capitalisation of USD 1.3 trillion in June 2017, which represents 41% of the global listed real estate industry (EPRA, 2017). In recent years, investors are shifting towards Asian REITs which is the fastest growing market in the world and has overtaken France and UK. Asian REITs are more transparent compared to the mature US market and other established markets. This has given a sense of comfort and security to investors to invest in Asian REITs. This momentum gained has created an interest for researchers to study on Asian REITs.

Since 2005, the average total returns in emerging markets have been higher than developed markets (9.20% vs 6.74%) and more recently (7.80% vs 4.63%) over the past three years, and 28.40% vs 0.84% over the past year. The high returns have been confined almost exclusively to emerging markets in the Asia Pacific region while emerging markets in Europe and the Americas have posted negative returns (Mohamad & Zolkifli, 2014). The rapid growth of Asian property market can provide opportunities for these global property securities fund to diversify their portfolio geographically and enjoy the higher return. According to Yue (2011), Asian REITs performed better than other

key REIT markets in most of mixed-REITs scenarios, and saw their significant roles in improving efficient global REITs portfolio returns. The growing implementation of REITs in developing countries connotes increasing importance of the real estate market in developing economies. Real estate also offers a stable investment return and is a good hedge against inflation. Asian REITs also generate the highest yields across global REIT markets and some of the widest yield spreads over risk-free investments.

The real economy and its business cycles has been the subject of investigation of studies trying to understand the factors that drive REITs returns. The performance of REITs are measured by the returns and it is influenced by many factors mainly macroeconomic factors such as inflation, industrial production, money supply, exchange rate, interest rate and many more. Macroeconomic studies the performance and behaviour of economy by analysing the factors that influences the REITs returns. Companies can use these factors and create a model to help them strategized their investment. Yet, the relationship between macroeconomic factors and REITs has not been researched extensively in developing countries largely because REITs are a recent phenomenon in these economies.

Other than that, the macroeconomic factors are considered to be the risks that have to be measured by investors. In order to generate profit from the investment, it is important to calculate the excessive return which exceeds the rate of return that was expected. Excessive return is used to measure the risk-adjusted performance by measuring how much risk from the macroeconomic factors is involved in producing that return. Hence, it is important to study the macroeconomic factors that will give an impact on the excessive returns of Asian REITs.

ASIAN REITS

In 2001, Japan (J-REITs) became the first Asian country to establish REITs. As of December 2017, there are 57 REITs listed in the Tokyo Stock Exchange and Osaka Stock Exchange with the market capitalization of USD103.5 billion and average dividend yield of 3.53%. South Korea is the second Asian country after Japan to establish K-REITs with 42 listed companies in the Korea Stock Exchange. Then it was followed by Singapore (S-REITs) in 2002 with 39 listed companies in the Singapore Exchange Limited and in 2003, Taiwan (T-REITs) with 9 listed companies.

In 2003, Hong Kong (HK-REITs) was established and now has 8 listed companies; and in 2005 Malaysia established M-REITs with 18 listed companies in the Malaysia Stock Exchange. From the year 2007 to 2016, Hong Kong showed the highest sustainable growth performance and Malaysia REITs provided more stable dividend yield and return on asset performance among the other countries that were investigated (Azhar & Noriza, 2017). The most recent country to

establish REITs is Thailand (Thai-REITs) in 2012. Although Thailand is the latest, it was quick to take off and has 50 listed companies in the Stock Exchange of Thailand.

According to Richard Price, a CBRE Global Investor, the growth opportunities in Asia are unique relative to almost all Western countries. This is because Asian REITs offer attractive investment features and benefits including liquidity and high yields, as well as unique features like Islamic REITs in Malaysia. REITs are publicly listed on the various major Asian stock markets. Asian REITs are actively traded in the same way as other shares on the stock market. Asian REITs are able to be readily bought and sold and enjoy a high level of trading turnover which means that it is sensitive to respond to the changes in the market.

Other than that, most Asian REIT markets require that at least 90% of the REITs taxable income must be returned to shareholders as a mandatory dividend pay-out to be classified as a REIT and be exempted from paying company tax. Often Asian REITs will actually distribute 100% of their taxable income as a dividend yield to shareholders. This means Asian REITs deliver attractive dividend yields that are significantly higher than normally seen with other types of shares. Any taxes to be paid are therefore only at the individual REIT shareholder level, resulting in most Asian REIT markets being tax transparent (Newell, 2012).

Asian REITs also have access to high quality income producing commercial real estate portfolios in sectors such as retail and hotel. Investors can either invest in sector specific REITs or diversify their portfolio which enhances their returns. Diversification can also be done in non-domestic real estate portfolios to provide exposure to other Asian markets and provide access to countries that have not established their own real estate market like China and India. Diversification by investing in different asset classes is a key portfolio management strategy in order to decrease investment risk as each asset classes perform differently in different market condition.

Asian REITs have strict regulatory structure with its requirements for corporate governance and financial reporting through audited financial statements and annual reports. A board of directors is also required to conduct annual general meeting and provide sufficient information in their website. This is to give full disclosure to the shareholders and the public. The operations of Asian REITs such as REIT funds management, portfolio management, asset management and property management are managed professionally by external and internal managers. Japan, Singapore, Malaysia and Thailand require external management structure whereas Hong Kong, Taiwan and South Korea require external and internal management structure. The management fees and securitization of Asian REITs is also lower than other companies listed on the stock market.

Mature REITs markets like US and Australia proved to have a good track of performance over the past 50 years. However, Asian REITs which was only established 16 years ago managed to compete with those mature markets by showing strong returns, low to moderate risk, strong risk adjusted returns, diversification benefits and outperforming some stock markets.

MACROECONOMIC FACTORS

Asian REIT markets require acute observations of investors and accurate judgments regarding the macroeconomic environment. This requires investors to make assessment on the macroeconomic factors as it has an impact on the return. Many scholars have demonstrated that macroeconomic factors have significant influence on the returns of REITs. Ooi and Liow (2004) investigate the risk-adjusted performance of property stocks in emerging markets of Hong Kong, Indonesia, Malaysia, Singapore, South Korea, Taiwan and Thailand report results indicating that the risk-adjusted performance of real estate assets is determined predominantly by macroeconomic factors.

West and Worthington (2006) used the GARCH model approach to empirically demonstrate that the macro-economy exhibits a significantly positive relationship with the return of REITs and that certain variables, such as the long-run interest rate, the short-run interest rate, unexpected inflation and the construction index, demonstrate particularly high correlations with commercial real estate returns. However, each macroeconomic factor has a different impact on different types of property portfolio.

Devaney (2001) also used the GARCH model to examine the influence of changes in interest rates on the excess returns of REITs and demonstrated that the yield of government bonds has a significantly negative relationship with the returns for both equity and mortgage REITs sectors. His study showed the macroeconomic factors have a different impact on the REITs sectors and the GARCH-M is more appropriate for the mortgage REITs than equity REITs. Therefore, it is important to test all the factors with all types of portfolios and sectors.

Another study carried out by Liow and Huang (2006) showed that the increase in the long-term interest rates is associated with lower excess returns. Although interest rate is one of the important factors affecting the excess returns on real estate, other factors include political stability, financial market deregulations, property supply and property prices and alternative investment opportunities also affect the excess returns.

In terms of inflation, according to Chan, Hendershott and Sanders (1990), and Chatrath and Liang (1998), stated that the studies of the relationship between REITs returns and inflation have not documented an unequivocal relationship. However, using the VAR model, Ewing and Payne (2005) empirically determined that inflation produces lower expected returns for REITs. Besides, the

unexpected shocks to inflation have an insignificant impact on excess returns on REITs, while Liow, Ibrahim and Huang (2006) found that the conditional volatility of an unexpected inflation is significant in explaining variations in listed real estate returns in some Asian-Pacific markets, although the direction of the effect varies by country.

Inflation is also caused by the global financial crisis. There are many studies on the performance of REITs during the financial crisis. The results of Huang, Wu, Liu and Wu (2016) show that as the global financial crisis occurred, there are high REIT-stock linkages and few diversification opportunities. Although Asia was deeply impacted by the financial crisis in 1997, it was not as impacted as the western countries in the global financial crisis in 2008 with Japan, Malaysia and Thailand being few of the least affected countries. This shows the capability of Asian REITs performance and returns despite the financial crises.

Other than that, inflation is measured by the consumer price index (CPI). Loo, Anuar and Ramakrishnan (2016) stated that all of the CPIs have significant influence on the developed REIT markets, indicating that investors are looking for inflation hedge when investing in the Asian markets. Inflation also gives an impact on the monetary policies. A study by Johnson and Jensen (1999) shows that a sudden monetary tightening lowers REIT returns for about a month after the shock. Meanwhile, Ewing and Payne (2005) stated that a monetary policy shock reduces REITs returns in the period following the shock. This is because unanticipated changes in the economy will cause a fall in REIT returns.

Other macroeconomic factors such as the gross domestic product (GDP) should be used to measure the performance of the economy of the countries. Naranjo and Ling (1997) found that the GDP or real per capita growth rate of consumption expenditures, the real Treasury bill, the term structure premium, and unanticipated inflation were significant on the real estate returns. Apart from that, Bilson, Brailsford and Hooper (2000) found that money supply, industrial production and exchange rates are significant with emerging equity returns. Therefore, these factors should also be investigated to find the significance with REITs returns.

In addition, REITs have a relationship with the stock markets. Liow, Zhou and Ye (2015) indicated that there are reasonable correlation dependencies between real estate securities and stock markets which are affected by macroeconomic factors. According to Fang, Chang, Lee and Chen (2016), the stock index has positive impacts on the REIT index in Japan, Singapore and China. Laopodis (2009) also investigated the interaction of REITs, the stock market and the real economy in the US market from 1971 to 2007 and found that REITs display similar characteristics to the movements in industrial production growth, implying that changes in policies impact the real economy, which in turn affect the returns on real estate stocks.

Although these macroeconomic factors have a significant impact on REITs and are useful to forecast the returns, they do not behave the same for the direct property market. REITs are also able to absorb shocks to which they are exposed compared to the direct property investment. Hence, it is important to take note that these factors are only to be considered for indirect property investment which is REITs.

From the previous research findings, the main macroeconomic factors found to affect the excessive returns of Asian REITs are long term interest rates, short term interest rates, inflation, gross domestic product, construction index, industrial production, money supply, exchange rates and consumption risk. However, Loo et al. (2016) stated that the number of significant economic variables influencing the REIT markets is fewer in the short term as compared with the long run. Thus, it is important to test the REITs market for a longer period of time.

EXCESSIVE RETURNS

Most investors focus only on the returns but not on the total returns after considering the level of risk, tax, inflation and other macroeconomic factors. This can lead investors into poor portfolio decisions and misplacing expectations. Hence, it is important to focus on the excessive returns, rather than the nominal returns because excessive returns are used as measures of the added value by the portfolio. Excessive return, also known as 'alpha', is the return rate minus the risk-free rate which is the Treasury bill.

According to Johnson and Jensen (1999) the NAREIT indexes had higher returns than the S&P 500 during expansive monetary periods, but all of the four (equity, mortgage, hybrid, and composite) NAREIT indexes underperformed the S&P 500 during restrictive periods. However, the Treasury bills returns during restrictive periods were higher than during the expansive periods. Due to the differences of REITs and Treasury bills returns at different periods, it is necessary to calculate the returns in excess.

Additionally, investors should be more concerned about the return in excess of risk-free rate. According to Chen and Wang (2016), one of the important reasons most investors choose stocks instead of riskless Treasury bill is that they have the chance to get higher return as the compensation of undertaking the higher risk. If the return that investors get from the stock market is even lower than the risk-free rate, then they would only buy the Treasury bill and undertake no risk. Therefore, the excessive return of the Asian REITs companies should be higher than the risk-free rate in order to compensate the risk taken by investors.

There are many empirical studies that show significant relationships between economic conditions and excessive stock returns. For example, Fama and French (1989), and Whitelaw (1994) found a significant dependency

relationship in the conditional distribution of stock returns and business conditions. Chauvet and Potter (1998) also found a time-varying relationship between stock return and risk in regard to business cycle turning points. Although there are many research on the excessive stock returns, studies on excessive REITs returns is very limited. This has motivated the current research to explore further on the excessive returns of REITs.

METHODOLOGY

The research methodology was designed to comply with a sets of objectives. The REITs companies of Asian countries that will be researched on are Japan, South Korea, Singapore, Hong Kong, Taiwan, Thailand and Malaysia. The data that will be collected are the monthly total return, risk-free rate and macroeconomic factors. The risk-free rate varies according to the country as each country has its own rate. The risk-free rate is required in order to get the excessive return. The data will be retrieved from the literature review and Datastream over the period of 17 years which is from 2000 to 2017. Datastream is used to explore the relationships, trends, perform correlations and develop view points on the Asian REITs portfolio. It also helps to generate and test the portfolio. There are four techniques that will be used to analyse the data collected which are Factor Asset Pricing Model, Principal Component Analysis (PCA), GARCH (1,1) Model and Generalised Method of Moments (GMM)

EXPECTED OUTCOME

This research is expected to find the macroeconomic factors that affect the excessive REITs returns to build up literature knowledge on the REITs market from the Asian and Malaysian market point of view. This research is also expected to discover the relationship between the macroeconomic factors and excessive returns of Asian REITs. Based on previous research, a positive relationship may be found between the variables (West & Worthington, 2006). Some macroeconomic factors such as the interest rates, inflation and construction index may have a higher significant relationship and higher correlation with the excessive returns compared to other factors (Bilson et al., 2000; Liow et al., 2006; Loo et al., 2016; West & Worthington, 2006). It is also expected to see how the macroeconomic factors affect and determine the excessive returns (Ewing & Payne, 2005; Laopodis, 2009; Ooi & Liow, 2004). Furthermore, the investigation on the excess returns rather than the nominal returns will provide information for an added value to the REITs portfolio.

CONCLUSION

The main driver of this research is to evaluate the excessive returns of Asian REITs that is affected by the macroeconomic factors. Asia is a large market and good investment opportunity for investors. Since much research has been done

regarding the REITs in developed countries, this research will focus to REITs in Asian countries such as Japan, South Korea, Singapore, Hong Kong, Taiwan, Thailand and Malaysia. Therefore, this research will be useful for international investors to better understand the potential portfolio returns of investing in the Asian REITs market and help them choose which Asian country they should invest based on the current macroeconomic factors. Lastly, this research will enhance knowledge of the Asian REITs and its excessive returns and provide more information to the Malaysian government, especially on the REITs market, in order to enhance the performance of REITs in Malaysia in the future years.

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SPILLOVERS EFFECT IN ASIAN PROPERTY PORTFOLIO MARKETS

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Abstract

This paper is to study the spillovers effect in Asian property portfolio market to assess the level of volatility. This is important due to investors increasingly set to go international on real estate market. The increase of integration of property portfolio markets from the perspectives of cross border has put the importance to assess the spillovers effect in particular Asian property portfolio market. The impact of a financial crisis has put paramount interest for investor and policy maker to know the level of volatility and consequently the effect on spillovers. In addition, real estate market has also been the subject of financial risk analysis. The globalisation process has given impact to the integration of market which consequently deregulation and financial market liberalisation. Therefore, spillovers effect among Asian portfolio market need to be assessed to increase the level of information as well as transparency of portfolio market.

Keyword: Asian, integration, property, portfolio, volatility, spillovers

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INTRODUCTION

The significance and performance of the Asian-securitised real estate sector justifies interest from global investors. Asian markets exhibited a very different behaviour compared to the other mature markets. The correlation between listed real estate securities and the relative broad stock market proved to be remarkable and approximately stable. Consequently, the Asian region offers many opportunities for investment on a range of different measures. Being amongst the fastest growing economies through the continent, Asia has several national markets that have reached majority in terms of market complexity transparency and competitiveness (Nguyen, 2011). According to research report by CBRE (2015), China and Singapore are two major countries as a source of capital at global investment. Strong growth and outstanding risk-adjusted performance by securitised real estate Asian markets has recently made international investors increasingly interested in real estate allocations in their portfolio.

According to the Steineit and Crowe (2001), listed property companies have become a progressively vital investment vehicle in Asia and internationally. This is because listed property companies have been used to obtain a broad range of other specific features such as return enhancement, secure dividend stream, inflation hedging and tax efficient cash flows generation. Asian also continue to play a major role in global investment particularly on source of capital. Some countries in Asian also introduced REITs such as Korea, Hong Kong, Singapore, Malaysia and Japan. However, most of the Asian countries property market are still on developing stage. As such, Asian markets may experience higher volatility compared to other mature markets (Razali, 2015).

Previous studies have reported that correlations between international stock returns, and to a lesser extent, between securitized real estate market returns (Liow, 2008) have increased in the context of globalization and financial integration. The market integration or segmentation does have effects for the relationship and linkages between difference markets. Furthermore, the market integration could also affect long term implications from the co-integration of the market. If markets are co-integrated, it implies the diversification opportunities between the markets are reduced in comparison to markets that are segmented. Financial deregulation, integration of national capital markets in periods of financial contagion have been found in strengthening interrelated markets across global property security markets. Consequently, real estate players such as global investors, fund managers and policymakers should care how this asset class behaves in times of crisis to volatility causality and contagion effect in international financial markets, because securitized real estate markets may have different patterns of causality and contagion due to the underlying asset. Thus, real estate can serve as a factor of production and as an investment tool. Therefore, fund managers need to be active in finding additional sources of diversification. Consequently, the integration of the market has also created

uncertainty among the markets which create volatility and spillovers conditions. Spillovers is a condition whereas the financial situation in one country able to give significant impact to other country(s).

This study also add academic value to the contagion and market integration literature, and this paper differs from other similar papers regarding interdependence and contagion of listed property companies. This especially arose after the 1997 Asian Financial Crisis (AFC) as well as the GFC. For instance, Ghysels and Seon (2005) examined the contagion effect of the Asian stock market during and after the AFC. Another study done by Caporale, Cipollini and Demetriades (2005) also examined a similar subject matter. Nguyen (2011) measured the volatility spillover of Asian listed property companies by segregating between developed and emerging markets. Razali (2015) has study the dynamics of volatility for Asian listed property companies during the global crisis. Nevertheless, how far the volatility level will effect in term of spillovers among pan-Asian countries' listed property companies? Therefore, this study investigates the level of volatility within the Asian real estate market over the period from 2000 to 2015. As the market has become more integrated it is therefore important to assess the spillover effect among pan-Asian countries.

RESEARCH BACKGROUND

Real estate markets are highly related to the financial markets; thus financial market volatility will impact on the risk level in the property securitised market. Market volatility is very important to policy makers. This is due to the fact that volatility levels will have a significant impact on the condition of the market. Volatility is part of the macro prudential assessment of market performance. Relatively higher levels of volatility indicate higher uncertainty regarding future cash flows and discount rates enhance future economic conditions (Danielsson, Valenzuela, & Zer, 2016). They added such high volatility can therefore be seen by forward looking economic agents as a signal of the increased risk of adverse future outcomes and a pending crisis. Therefore, understanding the volatility and property security market is crucial for leverage decisions. Significant changes in volatility will have a major impact on investors in terms of risk and return. Volatility is associated with unpredictability and uncertainty, and has a significant impact on performance as well as variance risk (Razali 2015). Investors will see volatility as a major indicator for market symptom disruption and condition of capital markets.

Thus, this paper focus on the spillover literature that underpins the empirical investigations in this study. In the cases of spillovers across different asset classes within a domestic economy, Shiller and Beltratti (1992) find a positive correlation between stock returns and bond yields. Ehrmann and Fratzcher (2004) find stock prices react strongly to monetary policy shocks in the USA. On international spillovers, many studies have focused on individual asset

prices in isolation. For example, King, Sentana and Wadhwani (1994) detect some conditional return and volatility spillovers from the US to the Japanese and UK stock markets. Andersen and Bollerslev (1998) find strong conditional return and volatility spillovers in foreign exchange markets. Bae, Karolyi and Sulrtz (2003) report that exchange rate linkages strengthened during financial crises for several emerging markets.

Towards this direction, Diebold and Yilmaz (2009) developed return and volatility spillover indices over rolling sub-sample windows to analyze contagion and interdependence across national stock markets based on the Cholesky factor identification of VARs. Diebold and Yilmaz (2012) have provided an unconditional directional volatility spillover study to the US financial markets to shed light on the nature of cross-volatility transmission during the recent GFC. Since then, the generalized spillover index methodology has attracted significant attention and has been applied successfully in many studies, which include Zhou, Zhang and Zhang (2012) on the Chinese and world equity markets; Antonakakis (2012) on Euro and major exchange rates over the periods from January 1986 to December 2010; Duncan and Kabundi (2011) on the volatility spillovers across South African currencies, bonds and equities from October 1996 to June 2013; Samanta and Zadeh (2012) on the return and volatility spillovers across international gold, oil, Dow Jones stock and real exchange rate (dollar) during January 1989 through September 2009. Recently, Louzis (2013) examines the return and volatility spillovers among money, stock, foreign exchange and bond markets of the euro areas from January 2000 to July 2012. Other notable studies are sovereign bond yield spreads (Antonakakis & Vergos, 2013; Alter and Beyer, 2014), as well as public real estate markets (Liow, 2013; 2014).

The most relevant that pertaining to the real estate study is done by Liow (2013) who investigated the volatility spillover effects of daily conditional volatilities across seven European public real estate markets. Using Diebold and Yilmaz (2012)'s spillover index methodology, Liow (2013) analysed the total volatility spillover effects, as well as the time-varying and directional spillover effects across the UK, France, Germany, Netherlands, Italy, Sweden and Switzerland public property markets from January 1990 through December 2011. Among others, Liow (2013) finds that each of the European markets has influenced and has been influenced by other property markets with different intensities of volatility spillovers. The introduction and implementation of the EURO was associated with a moderate increase of volatility spillovers among the markets examined. Additionally, these markets have experienced an increase in their volatility correlation, as well as become more open around the GFC period. In a different context, Liow (2014) explores the dynamics of return co-movements and volatility spillovers effects within three Greater China (GC) public real estate markets, as well as across the two GC markets (China and Taiwan), three Asia emerging markets (Malaysia, Philippines and Thailand) and

two developed markets (the US and Japan), sampled over the period from January 1999 to December 2013, with moderate degree of return co-movements and volatility spillover effects within and across the GC region reported in this study.

DATA AND METHODOLOGY

The spillover effect analysis will be based on volatility and analysed for each of the pan-Asian listed property companies. This research will covers the listed property companies' performance in pan Asian countries over the period from 2000 to 2015. The countries involve are Singapore, Malaysia, Japan, Taiwan, Hong Kong, China, Vietnam, Indonesia, Thailand, South Korea and The Philippines. This study employed Vector Auto-Regression (VAR) which based on study done by Diebold and Yilmaz (2012). VAR is a framework which forecast error variance decompositions which is insensitive to the variable ordering. This method able to capture the "spillover" effect or interdependence among the economic variables examined. In addition, this method assess the spillovers effect in time-varying manner. It can also explicitly differentiate the directional volatility spillover measures which add to the existing total volatility spillover index measure.

As has been emphasised, the generalized VAR model allows this research to examine the decomposition of forecast error variances through analysing the total and directional volatility spillovers across all asset markets, whilst at the same time the results are invariant to the variable ordering. As a results the VAR model will construct the spillovers index. The spillover index indicates the degree of cross-market spillovers (as captured by the share of cross-market error variance in the variance decomposition) relative to the total error variance of the markets examined. This spillover effect analysis covers an aspect of a total volatility spillover index which measures what proportion of the volatility forecast error variances comes from spillovers.

FINDINGS

Table 1 presents the volatility spillover index estimation based on 10 week-ahead forecast error decomposition for the 11-asset model of the full study period. The total conditional volatility spillover index, given in the lower right corner of the table, is approximately 43.3%, meaning that on average, across the emerging markets examined about 43% of the volatility forecast error variance in all 11 asset markets comes from spillover. In contrast, a relatively higher proportion (57%) of volatility movements is caused by a purely domestic factor such the idiosyncratic dynamics of the domestic asset markets volatilities in the past. Volatility persistence values are between moderate and high (30% to 93%) and are the highest in most asset markets, as shown by the respective diagonal figures of Table 1. Singapore and Vietnam is clearly most sensitive to the volatility impacts from the other markets. After Singapore and Vietnam, the real estate

security markets are ranked from most indigenous to most exogenous as follows: Hong Kong 22%, Japan 23%, Indonesia 31%, the Philippines 39%, South Korea and Malaysia 49%, Taiwan 54%, and Thailand 63%. Overall the 11 real estate security market's response to shocks from other markets appears to be diverse as the 11 markets are of different sizes and different levels of real estate market maturity.

CONCLUSION

This study also examined conditional international volatility spillovers of four major asset classes (public real estate, general equity, currency and bond) using a multi-asset class (i.e. 32 assets) VAR model across eight emerging countries based on Diebold & Yilmaz (2012)'s generalized spillover index methodology. Since the two crises (GFC and EDC) are exogenous to emerging markets, we focus on how sensitive emerging markets and which asset classes of emerging markets are to these crisis shocks.

Based on the results, the existence of interdependence level across the Asian markets are high. Moreover, this study inclines to conclude that Asian's property market were not spared from the financial crisis such as Global Financial Crisis and Asian Financial Crisis.

Overall, this chapter discussed on the implications of this study into several aspects namely knowledge literature and methodology, theoretical, industry and investors' perception to give overall insight the contribution of this study from different point of stakeholders' view. More importantly, this study able to inform the investors in term strategic-making of their investment strategy to pan-Asian countries. It can be seen over the past decade, several pan-Asian countries have showed high spillovers effect such as Malaysia, Indonesia, Japan, Taiwan and The Philippines has great influence in property portfolio investment to other countries. Although some of these countries showed low performance in term of Sharpe ratio and high volatility but from the point of spillovers index it showed some effect to other country. For instance, Malaysia, Indonesia and Taiwan have showed low performance with high volatility but showed some spillovers effect for most of pan-Asian countries.

Table 1: The conditional volatility spillover table

	From											
To	CHN	HK	IDN	JPN	KOR	MYS	PHL	SGP	THA	TAI	VNM	Contribution from Others
CHN	92.5	0.8	3.1	0.2	0.5	1.5	0.1	0.6	0.0	0.5	0.1	8
HK	4.2	78.3	0.7	1.3	12.5	0.0	0.0	1.3	1.3	0.2	0.1	22
IDN	1.7	8.3	69.3	8.8	1.0	0.6	0.6	4.2	3.1	0.7	1.7	31
JPN	0.4	3.4	7.8	76.6	0.0	0.0	2.3	1.4	0.7	2.2	5.2	23
KOR	5.7	2.0	20.9	12.2	51.5	3.4	0.0	0.4	0.3	2.2	1.5	49
MYS	3.6	3.9	10.5	26.2	1.1	50.8	0.1	2.8	0.2	1.0	0.0	49
PHL	4.3	3.6	8.1	1.6	1.9	15.3	61.2	0.0	0.1	2.4	1.5	39
SGP	4.2	10.9	0.9	10.6	0.5	19.7	15.3	29.5	2.7	2.8	3.0	70
THA	5.9	12.9	12.0	2.3	7.8	6.6	6.8	7.6	36.7	0.9	0.4	63
TAI	2.4	1.9	3.0	0.6	0.8	17.9	23.3	2.2	0.9	46.3	0.7	54
VNM	0.9	0.1	3.2	0.3	0.4	15.3	3.8	0.1	0.0	45.0	30.9	69
Contribution to others	33	48	70	64	27	80	52	21	9	58	14	476.4
Contribution including own	126	126	140	141	78	131	113	50	46	104	45	Spillover Index 43.3%

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THE APPLICABILITY OF LAND ALLOCATION APPROACH FOR POST-DISASTER HOUSE CONSTRUCTION IN KUALA KRAI

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Abstract

Despite 2,374 units of houses were destroyed during the 2014 major floods in Kelantan, the governments had only manage to build 143 units of post-disaster houses due to lack of land to accommodate the flood victims because of land ownership constraints. Current practice of post-disaster house reconstruction in Malaysia only accommodate victims with land ownership. The flood victims without land do not have the means or money to buy new land for the construction of the post-disaster house. A land allocation policy for victims without land has yet to be introduced in Malaysia. Using a case study approach, the thrust of this research is to highlight the need of land allocation approach for the flood victims who are without land for post-disaster house construction. Therefore, a semi-structured interview was conducted on twelve experts, from the field of land law, policies and administrations, to gauge their perceptions in the applicability of land allocation approach in post-disaster house construction. Data from the interviews were analysed using content analysis technique. Findings from the analysis showed that the experts recommended the state alienation approach in accordance with National Land Code 1965 to allocate land for an emergency, temporary shelters and post-disaster house construction. Land allocation policy can assist government in ensuring that land to shelter disaster victims can be made available after the disaster.

Keywords: post-disaster house construction, land allocation approach, land allocation policy

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INTRODUCTION

In the post-disaster reconstruction and rehabilitation phase, many disaster prone areas do not have land that is allocated for the purpose of emergency, temporary shelter and new permanent houses (Mijoni, 2009). Besides, acquiring land to accommodate the disaster victims who do not own land for the construction of new permanent house is often a difficult task in many countries (Hu, Sheu, & Xiao, 2014).

Most government do not maintain land allocation policies for the purpose of constructing post-disaster houses. For instance, in Haiti, lack of government policy and regulatory system had slowed down post-disaster shelter responses. There was no system for coordinating the damage assessment, which eventually determined at more than 400,000 buildings. As a result, the government had to create a unit, by attaching it to public works department and create policies regarding technical damage assessment which prolonged the reconstruction efforts (Leckie, 2011).

Similarly in Malaysia, there is often a lack of authority to provide land for the purpose of emergency, temporary shelters and new permanent house construction (National Disaster Management Agency, 2015). Thus, post-disaster relocation, such as flood victims relocation in Kelantan, Terengganu and Pahang, often opt out victims who do not own land (Chan, 1995). A land allocation approach to include all displaced victims has yet to be introduced in Malaysia (National Disaster Management Agency, n.d).

Land Allocation Approach in Post-Disaster Management

The absence of land allocation policy slows down post-disaster recovery efforts (Thomas, 2015). Because of lack of regulatory policies, it took far longer than necessary to establish land allocation policies (Leckie, 2011; Mohd, Fathi, Harun, & Chong, 2018). Forward looking land allocation policy can provide immediate location for the purpose of emergency, temporary shelters and new permanent house construction. Clear legal and policy frameworks on these issues prior to the occurrence of disaster can greatly facilitate eventual shelter programming by the international community (Thomas, 2015).

Land Allocation Practices in Malaysia and Other Countries

This section summarises post-disaster land allocation approaches in several countries including Malaysia.

Rwanda Republic

In Rwanda, according to the National Land Policy, all Rwandese enjoy the same rights of access to land, without discrimination against women or any other vulnerable persons. Vulnerable persons in disaster cases refer to the affected persons and they are eligible for resettlement under government projects. All

those affected persons whose family land/ houses/ business premises/ services or buildings that are located within the identified disaster prone areas will be acquired and compensated accordingly under the resettlement projects. It applied to all group of victims, the owners, renters or homeless (Republic of Rwanda, 2016).

The allocation of land is made available with the compliance of the procedure laid under Article 12 of The Expropriation Law. It stipulates that The Expropriation Law provides land for public interests, which includes resettlement projects as laid down under Article 5 of the Law (Republic of Rwanda, 2016). The only issue is the land will be acquired after the disaster had occurred. As a result, the reconstruction for post-disaster house takes far longer than necessary and the disaster victims will be staying in their temporary shelters until the land has been acquired for the purpose of post-disaster house reconstruction.

The Philippines

In the Philippines, the local governments had already drafted a relocation plan and disposed of land for housing the victims who have land ownership constraints in the post-disaster house construction (Carrasco et al., 2016). For temporary shelters while the victims wait for the completion of the post-disaster house, the private institutions will lease land for the purpose of providing land for emergency temporary shelters.

It is an advantage to have land available before a disaster strikes for temporary and new permanent house construction although there are some issues relating to the location of the resettlement sites which are away from the towns. The allocated land allows a quick start to the construction of new permanent houses to the evacuees, especially those without formal legal rights on the land they were occupying (Carrasco et al., 2016).

Bangladesh

In Bangladesh, land acquisition is used to allocate land for resettlement projects. The policies and guidelines also provide resettlement assistance to all the affected persons, irrespective of their land ownership status based on the Post Flood Jamuna Project model. The policy also states that the lack of legal documents for customary rights of occupancy or titles shall not affect the eligibility of the affected persons in the resettlement projects (Bangladesh Water Development Board, 2014). All affected persons as mentioned in the policies and guidelines will be eligible for compensation and assistance to be provided through the resettlement projects.

Islamic Republic of Pakistan

The Land Acquisition Act 1984 of Pakistan (with successive amendments) enables the government to acquire land for an emergency basis that includes

resettlement areas for disaster evacuees who lost their houses to the disaster (Islamic Republic of Pakistan, 2011). The land is allocated through acquisition following a disaster and the resettlement project is estimated to complete within two years. This provision ensures the immediate start of temporary shelters and reconstruction of post-disaster house following a disaster. However, only registered proprietor flood victims or customary rights holders are eligible for the resettlement project.

Republic of Haiti

The lack of land allocation policy in Haiti after the earthquake in 2010 was a wakeup call for the country as there was no system to coordinate the damage assessment which involved more than 400,000 affected buildings and could not provide an adequate place for shelter programmes which lengthen the post-disaster reconstruction effort (Leckie, 2011). After that, the republic has created a body to create land policies for the purpose of emergency, temporary shelters and post-disaster house construction. The policy provides post-disaster technical damage assessment, approach to allocate land for reconstruction and rehabilitation phase, temporary shelters and housing design for the displaced persons. The approach the Republic uses is through land disposal by the government for the purpose of emergency, temporary shelters and post-disaster house construction (*ibid*).

Indonesia

11,900 houses were destroyed by the 2004 Tsunamis in Acheh. To coordinate the recovery efforts, Indonesian government had created a Reconstruction and Rehabilitation Agency (BRR). The main issue in the reconstruction effort is that most of the areas in Acheh were no longer environmentally safe or desirable to be rebuilt. Thus, the government initial policy is to enforce the "No Build Zones" about 300 to 1,000 metres from the new shoreline. According to the policy, reconstruction for those previously living in these areas, many of whom were registered owners, would be relocated by the government.

About 30,000 tsunamis victims were unable to rebuild their houses on their pre-disaster land due to the No Build Zones policy and geological changes as some of their land have been permanently submerged. All the victims, including renters were relocated to new safer location through an acquisition of replacement land to the victims who are the land owners and provision for land tenure for victims who are renters and informal settlers (Wegelin, 2006).

Malaysia

As post-disaster land allocation policy is yet to be introduced in the country's disaster management, the approach for 2004 tsunami post-disaster house reconstruction is reviewed. The worst affected areas were in Penang and Kedah,

which involved 328 units of destroyed houses. Post-disaster house assistance were funded under the National Disaster Relief Fund. However, land ownership constraints among the tsunami victims have delayed the construction of the houses. The approaches taken by the government and non-governmental organisations in tackling the issue of victims who were non-land owners are summarised in Table 1.

Table 1: Malaysia approach in post-tsunami house reconstruction by location

Type of victims	Tanjung Bungah, Penang	Kuala Muda, Kedah	Langkawi, Kedah
Victims with land ownership	A new post-disaster house funded by the Federal Government under the National Disaster Relief Fund built on the land they owned.	A new post-disaster house funded by the Federal Government under the National Disaster Relief Fund built on the land they owned.	A new post-disaster house funded by the Federal Government under the National Disaster Relief Fund built on the land they owned.
Victims without land ownership	State government provides land and a few blocks of low cost apartments donated by public fund.	State government provides land and a basic low cost house for each of the renters and informal settlers.	Not applicable as all the victims were registered owners.

Source: Public Works Department (2015)

In Penang, as there was no land allocated for emergency purpose, the state government provided land for the resettlement project to help 133 displaced persons whom without land ownership. Low cost apartments were built on that land, funded through public donation. The total cost for the land, apartments, and basic utilities and facilities were RM80 million.

Similarly in Kota Kuala Muda, to accommodate the non-land owners, the government gave a piece of land and a basic house for each of them. The total costs of the relocation project amounted to RM20 million, including the cost of utilities, sewage plant, sewerage and other facilities. In Langkawi however, all the victims who had lost their houses to tsunamis were registered owners. Therefore, the construction of the post-disaster house was not an issue.

In Kuala Krai, due to flood, the cost to relocate all the 328 victims who were non-land owners was approximately about RM100 million. The delay to provide new permanent houses for the flood victims of Kuala Krai was simply because the scale of destruction was bigger, which involved 1,850 units of destroyed houses. With no land allocated for such purpose in pre-disaster planning, the reconstruction effort took far longer than necessary to be completed. Even 3 years after the flood, there are still flood victims who are living in temporary shelters and waiting for the post-disaster house assistance. The need for land allocation policy is obligatory as a solution in the post-disaster house reconstruction (Leckie, 2011; Thomas, 2015; Carassco, et. al, 2016).

The Need of Land Allocation Policy in Post-Disaster Context

Fitzpatrick, Dunn and Sanders (2008) articulated that in the post-disaster settings, land for building emergency, transitional and new permanent housing must be a priority. This is seconded by Leckie (2011) who stressed that to acquire new land following certain types of disasters, most notably severe flooding and tsunamis, is paramount because considerable amounts of land can be physically lost. In spite of all the flood rehabilitation and reconstruction management in Malaysia, the land allocation for emergency, temporary shelters and new permanent houses is still found lacking in post-disaster management.

In Malaysia, insufficient policy regarding land allocation for emergency purposes in Malaysian law is simply because Malaysia seldom has major disaster events. The major flood that hit Kelantan in December 2014 should be taken seriously in improving post-disaster recovery efforts in Malaysia. Through several reviews on the existing land allocation policies from different countries, it seems appropriate for Malaysia to consider land allocation policy in the flood disaster management under the land policy and land law. There are two approaches to make land available before a disaster strikes; 1) a provision under the state power to dispose of land as stipulated under Section 42 of the National Land Code 1965 and 2) the acquisition of land as laid down under the Land Acquisition Act 1960.

In Malaysia, land matters are under the purview of the state government as stipulated under the Ninth Schedule, List 2, Item 2 of the (Federal Constitution, p.272). The state authority has the right to gazette any state land for the public purpose with accordance to Section 62 of the National Land Code 1965 (p.79). In terms of legal aspect, the state authority can gazette any state lands for public purpose, in this case the land allocation for disaster reconstruction and rehabilitation phase.

Federal and state authorities also have the right to acquire land through Land Acquisition Act 1960 if necessary. As provided under Section 3(c) of the Land Acquisition Act 1960, government can acquire private land for mining, residential, agriculture, commercial or industrial purposes. The only issue is the interpretation of residential purpose does not further explain that the land can be acquired for an emergency, temporary shelters or new permanent houses. Established cases like Petaling Rubber Estates Ltd. vs. *Pemungut Hasil Tanah Kedah*, *Pemungut Hasil Tanah Kuantan* vs. Nor Cahaya Bt Ab. Majid and Oriental Rubber and Oil Palm Sdn. Bhd only discussed the acquisition involved were for the purpose of low cost residential housing schemes. If the land can be acquired for an emergency, temporary shelters and post-disaster new permanent houses reconstruction purposes, people who their lands are acquired cannot question the intention to acquire, except in the matters of adequate compensation (Abdul Aziz Husin, 1996).

From the legal aspects (Federal Constitution, National Land Code and Land Acquisition Act), the state authority has the ability to make land available for resettlement purposes in accordance to the National Land Code 1965, and any larger institutions can acquire land for acquisition if the interpretation of Section 3(c) of the Land Acquisition Act 1960 includes emergency nature such as disasters. Then, the land allocation can be made available before a disaster strikes. This will accelerate the process in providing new permanent houses for flood victims, regardless if the flood victims have own land or are landless.

RESEARCH METHODOLOGY

The aim of this research is to recommend a land allocation approach for the Kuala Krai, Kelantan flood victims who are without land ownership. Thus, this research applies case study approach to gauge the appropriate land allocation approach. As this research only focuses on the applicability of land allocation approach to accommodate flood victims without land ownership, a case study approach was used. To solve the issue of the lack of land allocation approach in post-disaster house reconstruction, in-depth semi-structured interview with related experts was conducted.

Data Collection

The questions used to guide the interview sessions were developed from Creswell and Plano's (2006) guidelines for developing and asking effective interview questions. The guided questions were:

1. Which approach of land allocation do you think is relevant in Malaysian context?
2. What aspects of this approach make it as a preferred approach to allocate land for emergency, temporary shelter and post-disaster new permanent houses?
3. What aspects of this approach, if any, do you find lacking or in need of modification?
4. Are there any other aspects of land law and policies that you would like to discuss?

This list of four questions was not comprehensive but only serves to achieve the research objective that is to recommend the applicability of land allocation approach to accommodate the flood victims who do not have land ownership. In addition, related secondary data were also sourced from published documents and existing Acts.

Data Analysis

The interviews were translated into English and were transcribed into electronic format (Microsoft Word). Subsequently, open coding method was used to analyse

the transcribed data. The data were coded or grouped by determining keywords and phrases that were common amongst the interviewees. Throughout the coding process, the phrases and keywords were analysed and encoded with suitable category labels and afterwards, commonalities were developed (Saldana, 2009).

Folkestad (2008) argues that this coding analysis helps researcher to build concepts and categories from entire document. The output is to build a descriptive preliminary framework for later analysis. As it builds directly from the raw data, the process itself ensures the validity of the work (Bryman, 2012). Miles and Huberman (1994) also suggest that to further analyse the results from the coding process, the data reduction is split into entities which in turn will be put into categories.

Finally, the categories from the content analysis were again reviewed and then triangulated to present the conceptual framework of land ownership constraints (the second objective) and the most recommended land allocation approach for emergency, temporary shelters and post-disaster new permanent houses (the third objective). These new emergent findings were narrated to relate to the implications of the research.

FINDINGS

As aforementioned, there are two possible approaches that can be applied in Malaysia to allocate land for an emergency, temporary shelter and post-disaster house construction for the vulnerable groups (the landless, poor, disabled, indigenous and elderly). They are the state alienation with accordance to Section 42 of the National Land Code 1965 and land acquisition under the provision of Section 3 of the Land Acquisition Act 1960. All the interviewees agreed that state alienation is preferred over land acquisition. The recommendation of land allocation approach for an emergency, temporary shelters and post-disaster house construction is summarised in Figure 2. **acquisition**

The Recommended Land Allocation Approach for Post-disaster House Construction

The aspects of the preferred state alienation approach were justified in two aspects; they are legally right and technically efficient if compared to land acquisition approach for emergency, temporary shelters and new permanent house construction purposes.

Two participants mentioned the Section 2 under the List 2 of the 9th Schedule of the Federal Constitution that articulates that land matters are under the jurisdiction of the state government. The other participant further added that as land is a state matter, the Federal Government cannot intervene in making the land allocation for the said purpose. Above all, it is legally permissible for the state government to allocate land for the purpose. Below are the excerpts from the selected participants.

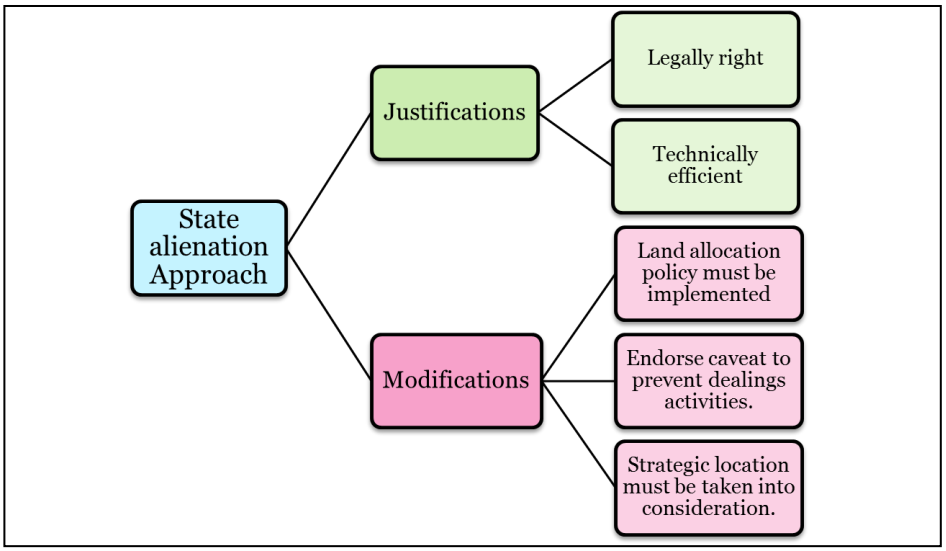

Figure 2: The recommended land allocation approach for emergency, temporary shelters and post-disaster house construction in Kelantan

> *"Look at Section 2 under the 9th Schedule. The Federal Constitution states that any state land is under the power of the state government. If the preface you gave me on the email earlier that the ways to provide land for disaster are acquisition and state disposal, I think the state should be responsible to providing land for disaster purpose."* [N1]

> *"Land is a state matter. So legally, to make land available for the purpose of disaster [referring to the land allocation for an emergency, temporary shelters and new permanent houses] is possible by the state [government]."* [N3]

> *"In my opinion this is the best approach because the state land is owned by the state government. So it can be disposed by alienation to the flood victims, and the process will be not complicated."* [N9]

> *"Legally, to make land available for the purpose of disaster [referring to the land allocation for an emergency, temporary shelters and new permanent houses] is possible by the state [government]*. [N11]

One of the participants said that the Kelantan land law is governed by the National Land Code 1965 and with accordance to Section 40 of the Code, it has the power to alienate land for many purposes as stipulated under the Section 42 of the Code.

> *"The first thing is if you go way back to the Malaysia land law, the land is under the state's power. The power is written under the Section 40 of the National Land Code [1965]. You see, the land law in Peninsular [Peninsular states] is governed under the National Land Code. When it comes to alienation of land, state [government] has the right to dispose land for reservation of land and other rights under Section 42 of the Code."* [N5]

Besides, the state government must take care of its people's quality of life and must not let them stay in the temporary shelters for long, which will make them more vulnerable. This is because the temporary shelters are not built to last long. Additionally, the shelters are erected on someone else's land and the settlers are at risk of eviction if they keep staying on that land.

> *"I think land allocation for such purpose should be provided by the state government [state alienation through the disposal of land]. It's their people; they need to have a holistic approach in the post-disaster housing construction."* [N6]

> *"Take temporary shelters as an example. Most of the temporary shelters in Kuala Krai are built for a temporary purpose, but the constructions of new homes for the victims are taking far longer time than necessary because of land issues. This makes the victims who are landless expose to eviction by the land owners."* [N10]

Equally important, all participants agreed that state alienation costs less, is quicker and involves less paperwork, which makes it technically more efficient than the land acquisition approach.

> *"If you compare state disposal [alienation] and the second approach [land acquisition], the cost is greater if an acquisition is chosen. Because it will involve the affected persons or bodies whom their lands are being acquired, the scheduled land must be adequately compensated."* [N1]

> *"It would be hassle free in terms of land administration and also involve less cost if the state government provides land for post-disaster context with the existing reserved state lands"* [N2]

> *"If we use the land acquisition approach, the cost will be high."* [N3]
> *"Theoretically we can use this approach, but it will involve a significantly higher cost."* [N4]

> *"Land acquisition approach will be quite difficult because it involves other people's land."* [N5]

> *"Approach of land acquisition will incur a high cost and is time consuming…"* [N6]

Although state alienation is the preferred land allocation approach, some improvements need to be done to acknowledge that the land allocation is for emergency, temporary shelters and new permanent house purpose in the state's jurisdiction.

> *"Such land [emergency, temporary shelters and new permanent houses] can be made available under Section 62 that says the state can reserve any of the state lands for public purposes, however it must comply with the Section 62(2) requirements. The reservation must be detailed, the purpose…the "public purpose" term. It is not written in the Code. Well in this case…, for disaster purpose."* [N3]

> *"…because the law allows the state [government] to do so. Above all, the land belongs to the state [government]. Next thing is the state [government] has the power to dispose of land for land reservation and ownership of land." [N2]*

> *"But for disaster context, does the reservation of land under section 62 allow any of the state lands to be reserved for emergency disaster purpose?"* [N8]

> *"…relevant bodies need to propose the existing law to be amended to include the emergency, [temporary] shelters and new [permanent] homes as public purposes. Except if there are already existing cases of law that had already interpreted such purpose as the public purpose."* [N9]

The Applicability of Land Allocation Approach in Malaysia's Post-disaster House Construction

Although the importance of land allocation approach for post-disaster purpose was established during the interviews, some measures need to be addressed before the implementation of the approach. To begin with, a land allocation policy must come into force. The participants addressed that with the land allocation policy, land can be made available before a disaster strikes. This will immediately assist vulnerable groups such as the elderly, disabled and victims without land ownership in the post-disaster house construction. The participants

were also concerned with the victims who built temporary shelters on private or state lands who will be evicted if the process to acquire land for them takes a long time.

> *"Land allocation policy must be introduced in the resettlement framework. What worries me is most of the temporary shelters in Kuala Krai are built for temporary purpose, but the constructions of the new homes for the victims are taking far longer than necessary because of land constraints. But if the government has allocated land for an emergency; all the aids, shelters and post house construction can be immediately provided and the landless victims will be not overlooked."* [N1].

> *"The existing legal framework is not particularly helpful or well written when it comes to renters. Because of this problem, (the) policy in the post-disaster housing construction must be enhanced (so) that (it) will include all disaster victims irrespective of their land titles."* [N3]

> *"I would also suggest, if possible, identify plots of land for a temporary use beforehand. This is all pre-disaster land policy planning".* [N4]

Secondly, the resettlement program must take into consideration the fact that the houses could be sold after the victims obtained the land and the new permanent houses. The government can endorse a caveat for a period of time, such as 10 years to prevent sale of the house by the victims. The house must also be occupied by the victims and not rented out. Any rental activities must be prohibited.

> *"…they need to stay there for more than five or six years to prevent the occurrence of buying and selling in a short time period. The alienated land must be inserted with (a) caveat up to 10 years."*[N5]

> *"Most importantly we have to make sure that the person who receives this land is really eligible to avoid fraudulent people who take advantage of the mercy of the state and federal provisions."*[N7]

Another highlight is that the land allocated for such purpose must be strategic, safe and has access to facilities such as schools, groceries and health care. This is because currently the resettlement for the 2014 flood victims is situated at flood prone areas and quite remote from Kuala Krai Town. This will discourage victims to settle at the designated place.

> *"The evacuation area is still an area at risk of flooding. Federal land [resettlement for 2014 flood victims] in Sungai Durian was also affected by the flood in year 2014. The Telekong resettlement program is also a flood-prone area, also located remote from the town [Kuala Krai] as it is near the forest reserved land."* [N12]

CONCLUSION

The availability of land will allow the immediate start of the post-disaster new permanent house construction in the resettlement areas. The state land is under the State authority jurisdiction as provided under the Federal Constitution (List 2 Ninth Schedule). If the state government can dispose land under the reservation of land, it is also possible for it to dispose of land for the purpose of post-disaster emergency, temporary shelters and new permanent houses.

This approach will provide land bank for an emergency. In Pakistan (the 2005 earthquake) and India (the 2001 Gujarat earthquake), for example, a lot of government-owned land made available quickly after the disaster for temporary shelters. Moreover, some NGOs actually bought land specifically to be used for temporary and permanent shelter in the post-disaster context.

Above all, the flood risks cannot be fully eliminated despite many mitigation programmes which have been executed by both federal and state governments. Thus, this land allocation approach through state alienation of land is a forward looking approach in providing land for an emergency, temporary shelters and post-disaster house construction.

The recommended approach cannot be implemented if there is no proposal being made to introduce land allocation policy in the disaster management policies. The land allocation policy for an emergency, temporary shelters and new permanent house construction needs to be integrated with the flood or disaster policies and related written laws. Therefore, in depth studies are recommended for an effective formulation of the land allocation policy for emergency, temporary shelters and post-disaster house construction in Malaysia.

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CRITICAL DETERMINANTS OF HERITAGE PROPERTY VALUE: A CONCEPTUAL FRAMEWORK

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Abstract

Real estate is complex in nature, whereby its value is determined by many characteristics. Heritage property is different as compared with non-heritage property, thus; it is essential to identify the heritage property value determinants due to limited published research about it. This paper closes the gap by reviewing the literature to identify the determinants. To achieve this, academic journals and conference papers in online databases from 1974 to 2017 have been reviewed. The results indicated that there are four groups of heritage property value determinants namely; i) transaction characteristics, ii) structural characteristics, iii) spatial characteristics, and iv) historical characteristics. It can be concluded that heritage property values are differentiated by historical characteristics notably on their architectural styles or design and the status of the heritage property itself. This finding should be a useful guidance for the valuers in valuation practice.

Keyword: heritage, property value, determinant factors, characteristics

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INTRODUCTION

Heritage property has valuable contribution for sustainability from social, environmental and economic perspectives, is widely recognized and emphasized by many government agencies, local communities and all stakeholders (Armitage & Irons, 2013). As the real estate is well known for its complexity in nature, there are many characteristics that influence its values regardless of the location (Abidoye & Chan, 2016; Rahman, 2018). Heritage property market is different as compared with non-heritage as the value for heritage property is created in the mind of stakeholders and specific buyers of specific types of properties, which are not only considered on the physical property. Therefore, it raises question on the factors contributed in determining the heritage property values or prices. Hence, it is necessary to identify the characteristics affecting the heritage property price and this assent motivates this study due to small number of research about it. According to the fundamental idea by Rosen (1974), the hedonic function for housing implies that the demand for each individual property will depend on its characteristics and this is similar with regards to heritage property. Thus, the identification of heritage property value determinants is imperative for the heritage property modelling and valuation. This study critically reviews conceptual and empirical literature from academic journals and conference papers in online databases dated from 1974 to 2017.

THEORETICAL FRAMEWORK OF HERITAGE PROPERTY VALUE DETERMINANTS

Property has complex characters that generate a dynamic market. It is a common knowledge as previous studies (Abidoye & Chan, 2016; Babawale, Koleoso, & Otegbulu, 2012; Brandt, Maennig, & Richter, 2013; Chin & Chau, 2003; Grum & Govekar, 2016; Hui, Chau, Pun, & Law, 2007; Y. Wang et al., 2017; Zoppi, Argiolas, & Lai, 2015) were conducted around the world in determining the critical determinants affecting the property value and establish three broad groups i.e. locational, neighbourhood and structural characteristics (Abdul Hamid, Tian, & Suriatini, 2014; Abidoye & Chan, 2016; Babawale et al., 2012; Brandt et al., 2013; Chin & Chau, 2003; Wong, So, & Hung, 2002). Previous studies on property market have also distinguished these factors into two main drivers: macroeconomic and microeconomic. Macroeconomic factors are related more to market factors such as supply and demand, gross domestic product (GDP), unemployment, household income, interest rate and etc. (Grum & Govekar, 2016), whilst microeconomic factors concern more on the physical property-specific factors. However, many academic studies have given extra focus in details on microeconomic factors (frequently related on structural and spatial) in modelling property prices. Overall, non-heritage property studies i.e. residential and housing market segments are given more attention to investigate the attributes that influence its property values while little attention has been paid to heritage

property studies. The results indicated that there are four groups of heritage property value determinants included: i) transaction characteristics, ii) structural characteristics, iii) spatial characteristics, and iv) historical characteristics as discussed in the following subsection. Table 1 summarizes the heritage property value characteristics which commonly used as independent variables in statistical analysis by numerous studies.

Table 1: Heritage property characteristics included in previous research

	Heritage Property Characteristics	Hough & Kratz (1983)	Vandell & Lane (1989)	Asabere, Hackey, & Grubaugh (1989)	Moorhouse & Smith (1994)	Ruijgrok (2006)	Ijla (2008)	Cebula (2009)	Tatt (2010)	Ahlfeldt & Mastro (2012)	Nijkamp (2012)	Lazrak et al. (2014)	Wright & Eppink (2016)	Warren, Elliott, & Staines (2017)	Junainah et al. (2017)
Transaction	Land tenure										√	√			√
	Transaction date											√			
	Selling condition										√	√			
	Year built						√				√	√			
Structural	Position of building					√		√							√
	Construction period					√					√	√			
	Maintenance/renovation					√				√	√	√	√		√
	Lot size			√	√	√	√			√					√
	Floor area	√	√		√		√			√	√	√			√
	Building materials				√	√				√					√
	Garage/parking space	√	√	√			√	√		√	√	√			
	Number of bedroom/room			√			√	√		√	√	√			
	Number of bathroom			√			√	√		√					
	Basement/patio									√					
	Fireplace			√				√		√					
	Age of property	√	√	√											
	Building amenities						√	√		√	√				
Spatial	Traffic flow/airport noise/noise level							√	√		√	√			
	Population density										√	√	√		
	Distance from city centre		√			√				√	√	√			
	Distance from CBD	√					√								

	Proximity to high quality school						√		√	√				
	Proximity to shopping centre								√					
	Proximity to public transport	√												
	Proximity to highway								√	√				
	Distance from main road													√
	Environmental quality				√		√	√		√				
	Percentage ethnic			√								√		
	Income per capita									√				
Historical	Heritage status	√		√		√	√	√		√	√	√		√	
	Architectural styles	√	√	√	√	√				√	√				√
	Authenticity					√									√
	Ensemble					√									√
	Facade types					√									√

Transaction Characteristics

Transaction characteristics are basically information in property sales transaction data. Land tenure, year of the property was built, selling conditions and the transaction date of the property are to be included in transaction- characteristics of spatial hedonic model analysis for heritage property (Lazrak, Nijkamp, Rietveld, & Rouwendal, 2011, 2014; Nijkamp, 2012). The land tenure on which the property is built can be either leasehold or freehold. Houses were revealed sold at a discount of 4.7% while the land plot is still in a leasehold conditions while it is confirmed that the transaction date variables in the hedonic regression analysis are significant and contribute to the model (Abdul Hamid et al. 2014; Lazrak et al. 2014; Mohd Lizam, Norshazwani Afiqah & Abdul Jalil, 2013).

Structural Characteristics

The characteristics under structural category are specific to the physical condition of the property itself. Babawale et al. (2012) found that structural characteristics contribute to the most significant group of factors as compared to neighbourhood and locational characteristics. This finding is tangent with theory by Ball (1973), which stated that there are more desirable characteristics in structural of a property than others did and it is reflected in higher market prices for that property from the valuation of these characteristics. Nijkamp (2012) suggested that floor area, capacity, number of bedrooms, presence of gas heater, dwelling insulation, year of construction, maintenance condition, existence of garden and presence of parking space to be included in structural characteristics of spatial hedonic model analysis for heritage property. Empirical evidences proved that the price increases if the property with the following categories;

i. Has a renovation or in good of maintenance condition (Abidoye & Chan, 2016; Armitage & Irons, 2013; Lazrak et al., 2014; Wright & Eppink, 2016);

ii. Has high quality of basic building materials (Amir Hossein Askari & Kamariah Dola, 2009; Grether & Mieszkowski, 1974; Lazrak et al., 2014; Ruijgrok, 2006);
iii. Offers for parking space/opportunities (e.g. Babawale et al., 2012; Grether & Mieszkowski, 1974; Hough & Kratz, 1983; Lazrak et al., 2014; Oduwole & Eze, 2013); iv)
iv. Bigger size of the property as well its floor areas (Abidoye & Chan, 2016; Babawale et al., 2012; Lazrak et al., 2014; Mohd Lizam, Norshazwani Afiqah, & Abdul Jalil, 2013; Oduwole & Eze, 2013; Ruijgrok, 2006; Sirmans, Macpherson, & Zietz, 2005);
v. Higher number of rooms or bedrooms and bathrooms (Babawale et al., 2012; Brandt et al., 2013; Ge & Du, 2007; Lazrak et al., 2014; Mohd Lizam et al., 2013; Zhang, Cromley, & Hanink, 2016);
vi. Higher number of age of the heritage property due to the historical characteristics (Li & Brown, 1980) and vice versa for non-heritage property studies (e.g. Brandt et al., 2013; Mohd Lizam et al., 2013; Zhang et al., 2016); and
vii. Strategic position of the property (Oduwole & Eze, 2013).

Spatial Characteristics

There is a large and growing body of hedonic house price research in the tradition of Rosen (1974) demonstrating that the price of a property does not only depend on the characteristics of a building itself, but also on the amenities and location it has to offer. Spatial characteristics are related to the locational, neighbourhood and local amenities (Tatt, 2010). Previous studies conducted over the years to examine spatial characteristics on property prices with mixed results and mostly the customers are willing to pay extra money for a site and generally enhance the value of the properties with the following categories:

i) Closer distance/accessibility to the nearest city centre or from Central Business District (CBD) (Hough & Kratz, 1983; Hui et al., 2007; Lazrak et al., 2014; Mohd Lizam et al., 2013; Oduwole & Eze, 2013; Ruijgrok, 2006; Tatt, 2010; Zhang et al., 2016), main road (Oduwole & Eze, 2013), highway (Heintzelman & Altieri, 2013) and whether the property is situated within lucky feng-shui beliefs (Abdul-Rashid & Ahmed-Usman, 2010; Choy, Mak, & Ho, 2007);
ii) A good environmental quality in terms of scenic view such as sea, river, mountain, lake; green areas such as forest, hill, golf course, landscape, garden/park, recreational well as its traffic/airport noise (Abdul Hamid et al., 2014; Han, Yang, Wang, & Xu, 2011; Hui et al., 2007; Asmawi, Noor, & Paiman, 2016; Noor, Asmawi, & Abdullah, 2015; Oduwole & Eze, 2013; Zhang et al., 2016);
iii) Externalities with proximity to shopping centre (Ge & Du, 2007; Tatt, 2010);

iv) Proximity to local government amenities or municipal services such as airport (Smith, 1978), schools (Ge & Du, 2007; Suriatini, 2005; Tatt, 2010), places of worship (e.g. mosques, churches, temples) (Brandt et al., 2013), hospitals, public transport (e.g. bus/train station) (Brandt et al., 2013; Heintzelman & Altieri, 2013; Hough & Kratz, 1983);
v) Socio-economic and demographic variables such as higher population density (Lazrak et al., 2014; Zoppi et al., 2015), percentage ethnic (Lazrak et al., 2014), income per capita/household income (Brandt et al., 2013; Ding, Simons, & Baku, 2000), as well as reduction in crime rates (Brandt et al., 2013; Ding et al., 2000; Oduwole & Eze, 2013).

Historical Characteristics

Theoretical framework except for the historical characteristics has been widely generated and extensively used in estimating housing demand and market. Junainah, Suriatini, Abdul Hamid and Thuraiya (2017), with Ruijgrok (2006) explored the influence of historical characteristics on the price of heritage property while Nijkamp (2012) pointed out that heritage characteristics includes its architectural beauty, meaning for science or historical-cultural value need to be included in spatial hedonic model analysis. However, it was justified without a proper empirical evidence. Ruijgrok (2006) explored the historical characteristics that explain heritage property but focused more on house value and measured in quantitatively with five variables; i) monumental status, ii) facade type, iii) architectural styles, iv) authenticity and v) ensemble by using hedonic regression analysis. It has long been debated the historic designation of heritage property status impact on property values by many scholars which appears in mixed results (Ijla, 2008; Warren et al., 2017; Zahirovic-Herbert & Gibler, 2014). Architectural styles are critical in determining the heritage property value whereby the pre-war buildings have unique "old charm architectural heritage" with eastern and western influences (Hendry Butcher Malaysia (Penang), 2016). Several studies attempt to measure empirical influence of architecture styles or design on heritage property value with variety measurements and their findings provide significant results (Ahlfeldt & Mastro, 2012; Asabere et al., 1989; Hough & Kratz, 1983; Ijla, 2008; Millhouse, 2005; Moorhouse & Smith, 1994; Ruijgrok, 2006; Vandell & Lane, 1989).

The prospective of heritage property value determinants

Review of past literatures revealed the uniqueness of this heritage property established for historic characteristics and would be crucially considered in the statistical analysis notable for assessing its value. Malaysian offers a variation of the architectural styles for heritage properties and it makes a strong sense that the historic architectural styles characteristic significantly influenced the heritage property values. Hendry Butcher Malaysia (Penang) (2016) had identified architectural styles as one of the factors that will attract investors to consider heritage properties in George Town, Penang other than its location, historical and social value, historical ambience and business potential factors. The situation being a major contribution and gaps in pertaining to examine this variable on the heritage property values. As the buildings either heritage or non-heritage within urban heritage are similar in the form and interior layout, however; it differs in their location and differs in architectural styles and features. Therefore, the different variation of architectural styles within the buildings makes it ideal to the study of identification for the heritage property market response in these architectural values. Ruijgrok (2006) supported the argument by indicating that in an area with more variation in architectural styles, this variable may explain the variation in heritage property price.

A few explanatory variables were applied from the previous studies and mostly stressed on structural and spatial variables into the model. Thus, this study suggests examining variety of the variables including historical characteristics to avoid omitted variable is bias since previous literatures indicated that the relationship exists between the four groups of characteristics and heritage property value. In this vein, it was concluded and priori expectations that transaction, structural, spatial and historic characteristics significantly influenced on the heritage property value as illustrated in Figure 1. Table 2 summarizes the variables that will be used in spatial hedonic model for heritage property valuation and its expected signs.

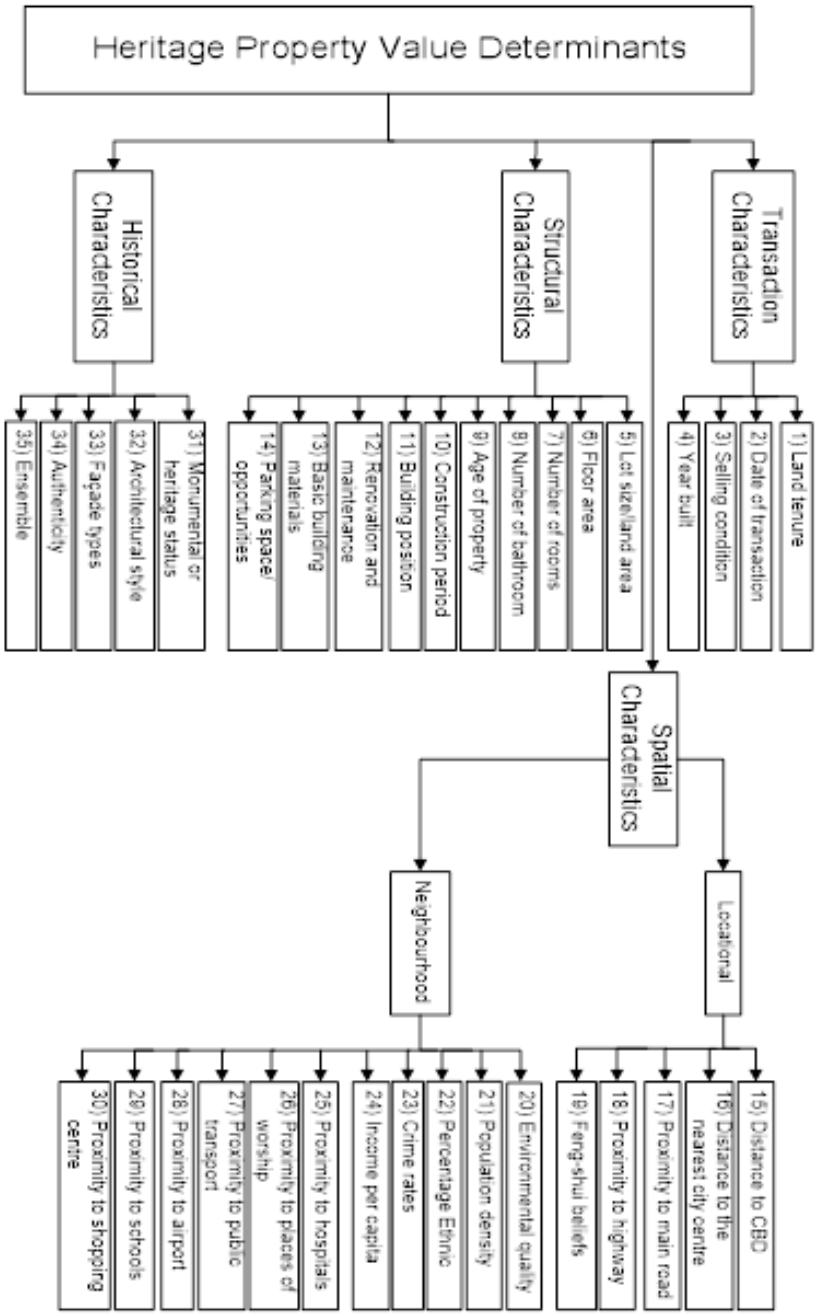

Figure 1: Conceptual framework of heritage property value determinants
Source: Adapted from Junainah et al., (2017), Lazrak, Nijkamp, Rietveld, and Rouwendal (2014); Nijkamp (2012) and Ruijgrok (2006)

Table 2: List of heritage property characteristics and its expected signs

		Variables		Expected effect on heritage property price
1.	Transaction	1.	Land tenure (freehold/leasehold)	+/-ve
		2.	Date of transaction	+ve
		3.	Selling condition	+ve
		4.	Year built	+/-ve
2.	Structural	5.	Lot size/land area	+ve
		6.	Floor area	+ve
		7.	Position of building	+ve
		8.	Number of rooms	+ve
		9.	Number of bathrooms	+ve
		10.	Age of property	+/-ve
		11.	Construction period	+ve
		12.	Renovation and maintenance	+ve
		13.	Basic building materials	+ve
		14.	Parking space/opportunities	+ve
3.	Spatial	15.	Distance/accessibility from CBD	+ve
		16.	Distance to the nearest city centre	+ve
		17.	Proximity to main road	+ve
		18.	Proximity to highway	+/-ve
		19.	Feng-shui beliefs	+ve
		20.	Environmental quality	+ve
		21.	Population density	+ve
		22.	Percentage ethnic	+ve
		23.	Income per capita	+ve
		24.	Crime rates	-ve
		25.	Proximity to airport	+/-ve
		26.	Proximity to schools	+ve
		27.	Proximity to places of worship	+ve
		28.	Proximity to shopping centre	+ve
		29.	Proximity to hospitals	+/-ve
		30.	Proximity to public transport	+ve
4.	Historical	31.	Monumental or heritage status	+/-ve
		32.	Facade status	+ve
		33.	Architectural style	+ve
		34.	Authenticity	+ve
		35.	Ensemble	+ve

CONCLUSION

It is apparent from various studies revealed that the heritage property characteristics comprise of transaction, structural, spatial and historical are mostly included in hedonic price models to determine the influences of its property value. It can be concluded that heritage property values are differentiated by historical characteristics notably on their architectural styles or design and the

status of the heritage property itself. Implication of this finding should be a useful guidance for the valuers on the practice of valuation.

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SUSTAINABLE BUSINESS LOCATION CHARACTERISTICS OF PURPOSE-BUILT OFFICES IN MALAYSIA

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Abstract

The location evaluation of purpose-built office (PBO) has increase in complexity with the addition of sustainability dimension in the evaluation. There are many elements that need to be considered in the complex sustainability concept of PBO in terms of location. This paper aims to investigate stakeholders' perceptions towards PBO in the context of sustainable business location in the Golden Triangle of Kuala Lumpur, Malaysia. Data was obtained through questionnaire survey utilising pairwise comparison technique. Analytic Network Process (ANP) analysis was then employed. The findings demonstrated the dependence of each sustainable business location characteristic of PBO based on the perceptions of selected stakeholders.

Keyword: Purpose-built office, sustainable business location, analytic network process

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INTRODUCTION

The purpose-built office (PBO) market is expected to remain competitive because it is backed by well-developed transportation infrastructure, for example, on-going Mass Rapid Transit (MRT) project to enhance the accessibility between the capital of Kuala Lumpur and surrounding areas (C H Williams Talhar & Wong, 2015). However, slow economy of the country has resulted in oversupply of office space in the market. To remain competitive, PBO location must suit the preferences and needs of the stakeholders. Therefore, in selecting a sustainable business location for office spaces, the preferences and needs of stakeholders act as important indicators to alter their decisions by examining the characteristics of PBO (Adnan, Daud, Ahmad, & Aziz, 2009).

In the competitive PBO market, there are previous studies which have identified and classified building characteristics of PBO based on the stakeholders' opinions and views. However, empirical studies on locational characteristics of PBOs from the office market participants' point of views are limited in Malaysia (Safian & Nawawi, 2012). Moreover, a finite number of location analysis techniques and grading matrix tools have been developed for locational aspect of PBO preference.

In Malaysia, the conceptual framework of locational characteristics of PBO is still being developed. By gauging the PBO stakeholders' perceptions towards sustainable business locations, it would help in boosting up the PBO market. Thus, the aim of this paper is to investigate the perception of stakeholders towards PBO in the context of sustainable business location in the Golden Triangle of Kuala Lumpur, Malaysia. After studying the stakeholders' perceptions on their needs and preferences towards the locations of PBOs, the weight of dependence of each sustainable business location characteristics for PBOs was determined. The Analytic Network Process (ANP), as a quantitative approach, was implemented to measure the dependence among sustainable business location characteristics and sub-characteristics of PBO in the local context.

STAKEHOLDERS' PERCEPTIONS MEASUREMENT TOWARDS SUSTAINABLE BUSINESS LOCATION CHARACTERISTICS OF PBO

Decision making is a continuous process in order to satisfy the preferences and needs of decision makers. Since there are many alternatives in location selection, selecting a sustainable business location for a PBO is a complex and challenging decision for an organisation. Thus, the perceptions of stakeholders are essential to obtain the final decision. At different levels of decision-making, it requires a measurement of individuals' needs. Multi-criteria decision making (MCDM) methods can solve the multiple conflicting criteria and a finite set of alternatives in selecting the best sustainable business location for a PBO.

The location evaluation of purpose-built office (PBO) has increase in complexity with the addition of sustainability dimension in the evaluation. The Analytic Network Process (ANP) has been chosen to gauge individuals' preferences and needs in selecting the best sustainable business location for PBO. ANP is the generalized form of AHP (Dong-mei & Chun-shu, 2011). In ANP model, the decision matrix is no longer linear as AHP. It need not be arrange in a hierarchical structure for the evaluation of criteria. Thus, ANP deals with dependencies (Ishizaka & Nemery, 2013). If the criteria are correlated, the elements listed are connected to one another.

All the relevant location criteria can be demonstrated and prioritised interdependent influences of each criteria in a network structure in the ANP model. The interrelationship within clusters of elements are allowed in order to overcome the limitation of linear hierarchical structures (Saaty, 2009). ANP model has better reliability, making it applicable in the real world environment (Taslicali & Ercan, 2006; Saaty, 2009). In this research, by implementing the Fundamental Scale for pairwise comparisons in the ANP analysis, the weight of dependence of each sustainable business location criteria for PBO is determined based on the perceptions of stakeholders.

METHODOLOGY

Questionnaire-based survey was adopted in the data collection process to investigate the stakeholders' perceptions towards PBO in the context of sustainable business location in Golden Triangle of Kuala Lumpur, Malaysia. Questions included the use the pairwise comparison method in determining the weights of dependence of sustainable business location characteristics for PBOs.

Research Sampling

Questionnaire survey was administered to occupants of PBO in the study area. This is because they are normally the first-hand users of PBO. Thus, the opinions of the occupants of PBO are essential in determining the relative dependence of the sustainable business location of PBO.

Selection of respondents involved two-stage cluster sampling. Two-stage cluster sampling is a combination of cluster sampling and simple random sampling method, which aims to identify each element that should represent the heterogeneity of the population (Ahmed, 2009). In the first stage, several main streets within the Golden Triangle of Kuala Lumpur were selected. The main streets were the primary sampling unit at this stage. Therefore, four main streets were selected, which were Jalan Ampang, Jalan Sultan Ismail, Jalan Raja Chulan and Jalan Imbi.

Each PBO along the selected main streets could be chosen randomly in the second stage of sampling. By using simple random sampling method, 5 PBOs for each of the four main streets were selected. This resulted in 19 PBOs were

selected in the study area. For each PBO, 10 of its occupants were selected to answer the questionnaire survey (Table 1).

Table 1: Survey sample in Golden Triangle Kuala Lumpur

	PBOs	**Occupants of PBO**
Sampling Technique	Probability Sampling: Two-Stage Sampling	Non-Probability Sampling: Quota Sampling
Sample size / Samples of occupants	19	10
Total sampling population	190	

Analytic Network Process

The development of questionnaire is designed in structured form based on the sustainable business location characteristics of PBO. The data collected in the questionnaires were the opinions from the occupants of PBO that will be used to determine the level of importance for each characteristic of the sustainable business location of PBO. All the occupants of PBO have different views and perceptions on each characteristic. Therefore, every occupant of PBO will have to decide the suitable and important characteristics in determining the importance level of sustainable business location characteristics for the PBO they occupied.

Instead of determining the priorities of PBO's sustainable business location criteria, ANP relates all the criteria which affect each other and have non-linear interactions in a network. The Fundamental Scale for pairwise comparisons needs to be implemented in determining each sustainable business location characteristics of PBO in the ANP model. With the ANP scale, the answers in the questionnaire were analysed to determine the level of importance for each characteristic of PBO in the research area. The ANP Scale in determining the pairwise comparisons for each characteristics of PBO is presented in Table 2.

Table 2: ANP scale to determine the weightage of sustainable business location characteristics of PBO

The Fundamental Scale for Pairwise Comparison	
Intensity of Importance	Verbal scale
1	Equal importance
3	Moderate importance
5	Strong importance
7	Very strong importance
9	Extreme importance
2, 4, 6, 8	Intermediate values

Source: Saaty (1980) & Saaty (1996)

The ANP method was applied to this objective to access the pairwise comparison for each sustainable business location characteristic for the evaluation of the PBO performance in Malaysia. All the pairwise comparisons were evaluated through the comparisons between two characteristics to determine the weight of dependence for each characteristic. However, the ratio scale priority vectors in the ANP that derived from pairwise comparison matrices are not synthesized linearly (Sadeghi, Rashidzadeh, & Soukhakian, 2012). Figure 1 illustrates on how the pairwise comparison for each sustainable business location characteristic of PBO.

Characteristics	← Weightage →																	Characteristics
Location of commercial feature	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Availability of transport options
Location of commercial feature	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Transportation distance
Location of commercial feature	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Vehicle flow
Location of commercial feature	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Efficiency of property market
Availability of transport options	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Transportation distance
Availability of transport options	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Vehicle flow
Availability of transport options	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Efficiency of property market
Transportation distance	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Vehicle flow
Transportation distance	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Efficiency of property market
Vehicle flow	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Efficiency of property market

Figure 1: Weightage diagram of sustainable business location characteristics

In the questionnaire, all the counterbalance between sustainable business location characteristics of PBO were evaluated using the pairwise comparison between two characteristics to obtain the dependence of the particular characteristic. In determining the weight of dependence of each sustainable business location characteristic of PBO, the geometric mean method and ANP method were employed to analyse the data and information obtained in each questionnaire. In this questionnaire survey, Microsoft Excel was used to translate all the data collected by the geometric mean method. The geometric mean obtained for each characteristic of PBO was then applied in the ANP analysis to determine the relative dependence among each other. With the help of ANP software, the weight of dependence of sustainable business location characteristics of PBO was calculated.

RESULTS AND ANALYSIS

157 occupants from the selected 19 PBOs responded to the questionnaire-based survey. In this survey, each PBO building was evaluated for the weight of sustainable business location characteristics using ANP approach. Data were compiled and analysed based on main streets selected.

Table 3 presented the dependence of each characteristic that have been indicated by the preferences of stakeholders towards sustainable business location of PBO.

Table 3: Overall mean weightage of sustainable business location characteristics

Characteristics	Mean weightage				Overall mean weightage
	Jalan Ampang	Jalan Sultan Ismail	Jalan Raja Chulan	Jalan Imbi	
Location of commercial feature	5.4	8.1	7.9	9.1	7.6
Availability of transport options	13.5	13.5	10.8	11.7	12.4
Transportation distance	12.1	11.6	9.1	11.0	11.0
Vehicle flow	12.9	8.6	10.9	7.4	10.0
Efficiency of property market	11.0	10.3	14.4	11.4	11.8
Image/Branding of location	11.8	11.8	12.0	7.9	10.9
Access to amenities	11.8	7.9	10.1	9.9	9.9
Access to public transportation and terminal	14.3	18.2	11.8	15.8	15.0
Access to market	7.2	9.9	13.0	15.8	11.5

Based on Table 3, in overall, the access to public transportation and terminal characteristic was favourable for occupants of PBO since it has the highest overall mean percentage whereby it has recorded the weight of dependence of 14.3% for Jalan Ampang, 18.2% for Jalan Sultan Ismail, 11.8% for Jalan Raja Chulan and 15.8% for Jalan Imbi. The findings also show that the characteristics of availability of transport options, efficiency of property market, and access to public transportation and terminal were on average level where the percentage of weight of dependence has recorded above 10% for all the streets. Nevertheless, the characteristic of efficiency of property market has gained the highest percentage of weight of dependence, which was 14.4% for Jalan Raja Chulan. The weight of dependence of the availability of transport options,

transportation distance, vehicle flow, efficiency of property market, image/branding of location, access to amenities and access to market characteristics were average, around 7.2% to 15.8%. For Jalan Imbi, the access to market characteristic has ranked the highest in the percentage of weight of dependence where it gained the percentage of 15.8% as much as the access to public transportation and terminal characteristic for the same street. However, the location of commercial feature characteristic has the least overall mean weightage along Jalan Ampang, Jalan Sultan Ismail, Jalan Raja Chulan and Jalan Imbi at 5.4%, 8.1%, 7.9% and 9.1%, respectively.

Based on the findings, it is proven that the characteristic of access to public transportation and terminal was chosen by most of the respondents compared to other main characteristics since they prefer to have easy access to their workplaces by public transportation. On the other hand, the location of commercial feature characteristic was not favoured by the respondents for all four streets because most of commercial landmarks, PBO buildings and commercial buildings are located in Kuala Lumpur Golden Triangle areas.

CONCLUSION

The ANP analysis conducted presents the weight of dependence of each sustainable business location characteristic for PBO. In determining the weight of dependence of each characteristic, the perceptions of stakeholders are useful in order to achieve the aim of this paper. The analysis revealed that the weight of dependence of locational characteristics of PBO from the perceptions of stakeholders. Through the application of ANP approach, the findings obtained have distinguished this research from the previous studies in which the interdependency among each characteristic in the sustainable business location model of PBO has measured. A further study is required to develop a location factor matrix in order to improve the Malaysian PBO market.

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ANALYTIC HIERARCHY PROCESS: AN EMPIRICAL VALUATION FOR INTANGIBLE ASSETS

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Abstract

Intellectual capital or intangible assets has become widely accepted as one of the most important assets of many of the world's largest companies. However, it is often pointed out that conclusion about valuation in intellectual capital shows a significant difference to capture the potential corporate value activities and determine their future earnings. This paper empirically investigates valuation in the intellectual capital by applying the Analytic Hierarchy Process (AHP) by sorting the non-financial value driver for their weight contributions. It uses top-four industrial sectors in Indonesia which are competing in a distinctive sector to find the observable performance differences. Simultaneously, to complete this research, questionnaires were distributed to valuers in the headquarter of Indonesian Directorate General of State Assets Management (DGSAM). AHP model was used to explore the value weights and ranks among those industries. The findings in this paper are focused on investigating the relative value distribution and determining the diverse patterns across industry by highlighting the importance of intellectual capital to create value advantages.

Keyword: valuation, AHP, intangible, intellectual capital

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INTRODUCTION

Intellectual capital or intangible assets are recognized as one of the most important assets of many of the world's largest and most powerful companies (Lin & Tang, 2009). Especially in recognition for the purpose of mergers, acquisitions, and accounting report, right now, it is still difficult to understand the reliability of the value of intellectual capital (Frederick, 2009). Intellectual capital can also cause a direct effect in assessing the firm value that sometimes under-valued. Thus, the ability of an enterprise to gain its competitive advantages and to support them as well is partly determined by its core competencies that are embedded deep within an organization (Stan, Dumitrascu, & Pele, 2017). The importance and complexity of intangible assets has created a purpose for valuation, for example in financial reporting purposes as well as for the management of state finances.

Ocean Tomo ("Ocean Tomo Releases 2015 Annual Study", 2015) has released its findings from Intangible Asset Market Value Study of the composition of equity market values that reported the components of S&P market value as illustrated in Figure 1. Following the finding, by looking into the trends portion of company's report in S&P 500, it is crystal clear that since two-decade ago, more than half of investment has been invested in intangible asset.

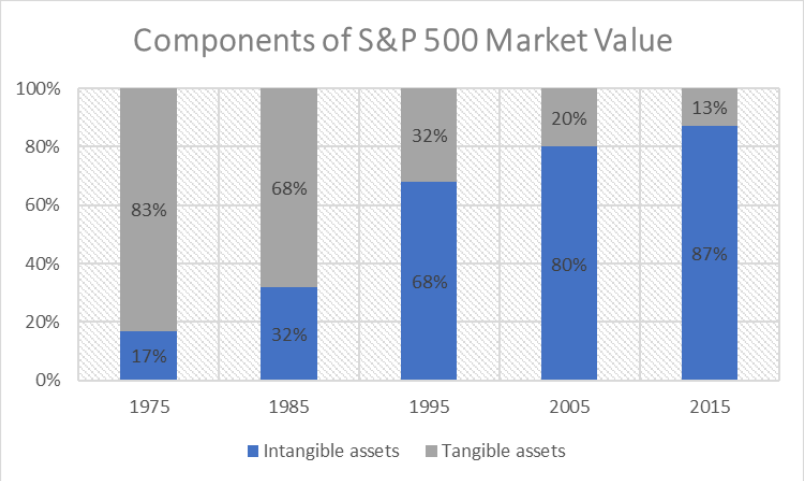

Figure 1: Comparison between investment in tangible and intangible asset
Source: Ocean Tomo (2015)

Accordingly, this paper investigates the relative value distribution of a company's intangible assets, which is closely related to the concept and application of "value drivers". Furthermore, the value drivers will significantly determine the level of intangible asset that could be created through an analytic hierarchy (AHP) process. Following Lin and Tang (2009), the AHP method in

valuation process was set up to sort the non-financial value drivers according to their weighted contributions. Using AHP will help companies to assess appropriately and to avoid bias in measuring the fair value of an entity. In addition, by giving the substantial part of intangible assets to the contribution of total assets in many industries, the top-four industries basically from their volatility and their trading volume in Indonesia Stock Exchange, Indonesia, were used as the object of indicator to professional valuer in DGSAM in order to test the suitability of applications, models, and explore the weight of the value of intangible assets and its evaluation among different industries.

This paper examines the intellectual capital in relation to research on contemporary valuation analysis. The focus is on one of the most 'visible' research subjects: intangible assets. In doing so, this paper explores the 'silences and secrets' of the intellectual practices through which drivers are recognized as a missing problem. This intellectual capital research field is a fertile opportunity to examine the constellation of academic and practical knowledge. This research represents a desire to contribute in business valuation which also has played a central role and important matter of concern in making decision.

RESEARCH BACKGROUND

Indonesia Stock Exchange

The presence of capital market or stock exchange in Indonesia began in the era of Dutch East Indies on December 14, 1912, when the Dutch government through the Amsterdam Stock Exchange established a stock exchange association in Jakarta (ISE, 2014). And legally, PT Bursa Efek Indonesia (the Company) was established based on notarial deed No. 27 dated December 4, 1991 as amended by notarial deeds No. 142 dated December 13, 1991 and No. 254 dated December 21, 1991 (ISE, 2014). By stepping up for its growth, compared to regional exchanges, IDX's achievement is promising although not the best (ISE, 2016a) However, the performance of Indonesian capital markets had made encouraging progress until 2016.

Until the end of 2016, the top big-four sectors in IDX were in mining, agriculture, property and financial, which boosted the overall growth of listed company in Indonesia. Based on data from Indonesia Stock Exchange Statistic (ISE, 2016b), the average index rate indicated that four sectors in the Indonesia Stock Exchange 2015-16 were rather stable (Figure 2). Otherwise, the trading volume that indices by the bar from the left axis shows the dynamics of the number in million shares that has been distributed in the past two years.

AHP

Apparently, AHP is a theory and methodology for relative measurement (Saaty, 1990), which is not kind of an exact measurement of some quantities, but rather

on the proportions between them (Brunelli, 2015). Formally, to operationalize, in a decision process there are several sets of AHP pillars, which are (i) ratio scales, proportionally and normalized ratio scales (ii) reciprocal paired comparisons (iii) the sensitivity of the principal eigenvector (iv) clustering and using pivots to extend the scale (v) synthesis to create a one-dimensional ratio for representing the overall outcome (vi) rank preservation and reversal, and (vii) integrating group judgments (Lamata, 2006).

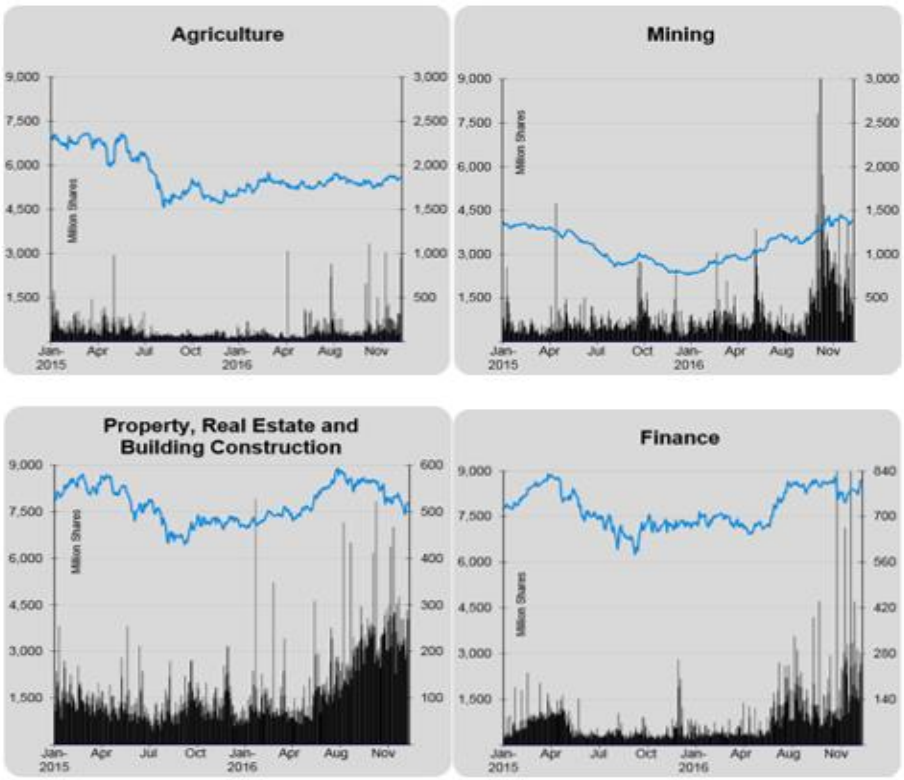

Figure 2: Comparison between 4 big industries in Indonesia (2016)
Source: ISE (2016b)

Making decision in AHP stage seems easy, however, to understand the principles behind the AHP and real-world applications have presented a much higher level of complexity while we would note that hierarchies can contain more levels of criteria (Brunelli, 2015). The reason to overcome this problem is to use pairwise comparisons which allows the decision maker to consider two alternatives at a time (Saaty, 1990). Thus, the strategy is that of decomposing the original problem into many smaller subproblems and deal with these latter ones (Brunelli, 2015). Formally, the pairwise comparison is an effective way to

aggregate the relative weights of decision elements to arrive at a set of ratings for the decision alternatives (Zahedi, 1986).

Saaty (1990) proposed a simple formula for pairwise comparison by using a matrix equation which has positive entries in single row and column, as the origin of his fundamental scale of absolute number (Table 1), with reciprocal property (Figure 3). The solution of those multiplication = nw, named the principal right eigenvector which consists of positive entries and is unique to within a multiplicative constant (Saaty, 1990).

Table 1: Level of importance in AHP

Intensity of importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
3	Moderate importance	Experience and judgement slightly favor one activity over another
5	Strong importance	Experience and judgement strongly favor one activity over another
7	Very strong or demonstrated importance	An activity is favored very strongly over another; its dominance demonstrated in practice
9	Extreme importance	The evidence favoring one activity over another is of the highest possible order of affirmation
2,4,6 and 8	Intermediate values between the two-adjacent judgement	When compromise is needed

Source: Saaty (1990)

$$\begin{bmatrix} w1/_{w1} & \cdots & w1/_{wn} \\ \vdots & \ddots & \vdots \\ wn/_{w1} & \cdots & wn/_{wn} \end{bmatrix} \begin{bmatrix} w1 \\ \vdots \\ wn \end{bmatrix} = n \begin{bmatrix} w1 \\ \vdots \\ wn \end{bmatrix}$$

Figure 3: AHP Formula
Source: Saaty (1990)

Those results must meet the consistence level of the relative importance of the attributes. Since subjective judgment may present decision biases, its consistency must be checked. It is a common that the pairwise comparison is considered consistent when the consistency index value is less than 0.10.

Intangible Assets

Lev (2001) emphasized that intangible is an asset which is claims to future benefits with no physical or financial embodiment, with the term intangibles, knowledge assets and intellectual capital are used interchangeably. Terminology of 'intangible assets', in this research, is obvious from 'intangibles' in the financial report. The value to the company which are long term, and just as typically they cannot be accurately valued until the company is sold, being then converted to and lumped under the title 'goodwill', which is calculated as the

difference between purchase price and book value (Daum, 2003). It focuses on resources that are not material, and highlights the growing importance in the economy and in companies of this hidden wealth (Andriessen, 2004).

Creating the Value Driver

Corporations sometimes choose not to focus on value creation and, instead, unintentionally make decisions that systematically decrease the long-term value of their businesses (Lin & Tang, 2009). The definitions of value creation depends on the relative amount of value that is subjectively realized by a target user (or buyer) who is the focus of value creation, whether individual, organization, or society, and that this subjective value realization must at least translate into the user's willingness to exchange a monetary amount for the value received (Lepak, Smith, &Taylor, 2007). Lepak, Smith and Taylor (2007) also stated two important economic conditions that may be necessary for value creation activities to endure as:

- the monetary amount exchanged must exceed the producer's costs (money, time, effort, joy, and the likes) of creating the value in question, at least for the single point in time when the exchange occurs; and
- the monetary amount that a user will exchange is a function of the perceived performance difference between the new value that is created (from the new focal task, product, or service) and the target user's closest alternative (current task, product, or service).

It is an interesting subject when accounting does not provide an effective information and how to create the value to leverage corporate intellectual capital. Value creation also creates new competitive space for firms and sustainable competitive advantage in business enterprise (Prahalad & Ramaswamy, 2004). However, in building the value creation, managers should decide which assets are the most important drivers of the company's value-creation system (Lin & Tang, 2009). For instances, setting up the efficient manufacturing process, innovation through product development, creating a new brand, e-commerce, and easy data interchange from software application.

Theoretically, an asset, whether tangible or intangible, is assessed through its expected future discounted cash flow. This is the basic principle of the discounted cash flow. From such premise, strategies drawn by a company may positively or negatively affect a given company's value. Consistent with this principle, Lev (2001) defined intangible asset as a right for future benefits that do not have a physical or financial body (stocks or debt securities). In order to allow a better understanding of the intangible asset concept, it is necessary to present its classification.

Lin and Tang (2009) stated that it is necessary to differentiate intangible assets from drivers that lead to the formation of their values, which means intangible assets must not be considered as drivers themselves. In other words,

those non-financial components would be related by the definition of the intangible assets' values. Kalafut and Low (2001) suggested that the critical drivers are innovation, quality, customer relation, management capabilities, alliances, technology, brand value, employee relations, and environmental and community issues. Looking deeply, all of those are non-financial drivers. In understanding the important nature of intangible assets, then the drivers are attributes that may be associated with different types of intangible assets. Meanwhile, the higher or lower intensity in the relative importance of each driver may influence the formation of value for intangible assets (Lin & Tang 2009).

CONSTRUCTING THE RESEARCH MODEL

By understanding the category of drivers developed by Kalafut and Low (2001), a quantitative research was conducted. It consisted of four assessing dimension drivers and 11 assessing criteria for probing into the issue regarding the value of weights of intangible assets in mining, agricultural, property and finance industries. The research model was then validated by speakers and practitioners from Directorate General of State Asset Management (DGSAM) Head Office, to ensure that the model constructed fits the needs and is reasonable.

For primary dataset, a questionnaire was developed to help allocating the assessment dimension. The sample of assessment dimension was derived from certified valuer in DGSAM or at least a non-certified valuer but has completed the 200 hours of training in valuation. A total of 102 copies of questionnaires were issued. While 82 copies were valid, all of them recollected with CI/CR ratio less than 0.1 were selected to be effective analysing samples.

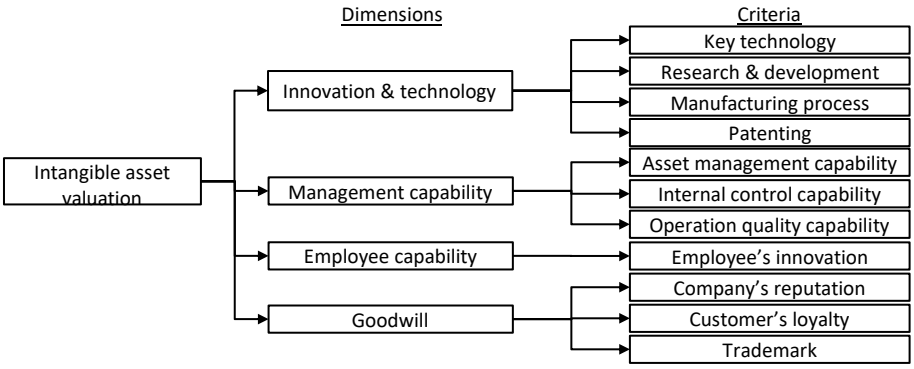

Figure 4: The model of intangible asset evaluation
Source: Lin & Tang (2009)

Therefore, the AHP method was used during the survey, attempting to quantitatively rank the non-financial contributions as shown in Figure 4. The implicit assumption underlying here is that genuine intangible asset values may

vary between firms, but professional executives within the same industry should have a converged idea regarding the ways in which the intangible assets should be arrayed when they consider comparing the relative importance of the value drivers. Therefore, directly after obtaining the ideal measure of intangible assets surveyed through AHP, other methods can be used by the management in order to assess the way in which the arrangement of the individual company's intangibles is diverged from the so-called ideal structure; this is particularly useful while encountering business mergers and acquisitions since it serves as a helpful reference for business valuation.

RESULTS AND ANALYSES

Table 2 shows the weights (relative importance) of intangible asset appraising dimensions assigned by the professional executives in DGSAM. 'Technology innovation' has been considered as the most important dimension, which has weights 0.55 for Mining industry and 0.48 for Agricultural industry. In the same way, both of Mining and Agricultural industries have the least weight in 'goodwill' dimension for 0.05 and 0.06. On the other hand, 'management capability' has been reached as the highest dimension which has 0.56 in Property and 0.54 in Finance sector while 'technology innovation' only 0.12 and 0.08 in those sectors.

Table 2: The weights of appraising dimension of intangible assets in different industries

Industry category	Technology innovation	Management capability	Employee capability	Goodwill
Mining Sector	0.55	0.28	0.12	0.05
Agricultural Sector	0.48	0.29	0.17	0.06
Property	0.12	0.56	0.14	0.17
Finance	0.08	0.54	0.13	0.25

Source: This Study

In terms of the criteria, as shown in Table 3, the non-financial driver performance of the Mining industries was modest; the top-three highest score were Key Technology (0.306), R&D capability (0.195), and Manufacturing process (0.121). Despite the fact that they are operating in distinct domains of activity, the top-three highest drivers in Agriculture sector were the same with the Mining sector, which were R&D capability (0.252), Key Technology (0.184), and Manufacturing process (0.114). This could be due to the fact that those knowledge-manufacturing industries need to know the importance of research and how to make an efficient process. This source is the crucial factor affecting a company's ability to remain competitive in the marketplace.

Table 3: The weight of appraising criteria of intangible assets in different industries

Appraising criterion	Mining	Agriculture	Property	Finance
Innovation and Technology				
Key Technology	0.306 (1)	0.184 (2)	0.030 (10)	0.022 (11)
R & D capability	0.195 (2)	0.252 (1)	0.034 (8)	0.034 (8)
Manufacturing process	0.121 (3)	0.114 (3)	0.034 (9)	0.026 (9)
Patenting	0.036 (9)	0.051 (7)	0.024 (11)	0.024 (10)
Management Capability				
Asset Management capability	0.062 (5)	0.071 (6)	0.336 (1)	0.288 (1)
Internal Control capability	0.056 (7)	0.048 (9)	0.101 (4)	0.104 (3)
Operation quality capability	0.058 (6)	0.043 (10)	0.122 (2)	0.168 (2)
Employee Capability				
Employee's innovation	0.063 (4)	0.074 (5)	0.059 (7)	0.076 (7)
Goodwill				
Company's reputation	0.036 (8)	0.077 (4)	0.112 (3)	0.099 (4)
Customers's loyalty	0.034 (10)	0.051 (8)	0.080 (5)	0.082 (5)
Trademark	0.033 (11)	0.035 (11)	0.068 (6)	0.077 (6)

Source: This Study

For Property sector and Finance industry, the highest was Asset Management capability, with score of 0.336 for Property and 0.288 in Finance. This is followed by Operation quality capability, which scored 0.122 for Property sector and 0.168 Finance (0.122 and 0.168). The distribution highlights the characteristics of those industries at their level of risk-associated with the degree of investment. Therefore, if the firms were responsible for improving asset management capability and operation quality, their action will be reflected in how they develop their relationship with their investors to capture the competitive advantage in those sectors.

CONCLUSION

In the context of this paper, we have seen how intangible assets correspond to corporate value creation and represent the source of non-financial competitive advantage. Intangible asset in its economic aspects is embedded in the problematic dynamics of the market economy and is more likely to help businesses avoid bias due to mainly relying on financial statements when measuring an entity's value.

By referring to the significant proportion of intangible assets, this research provides different platforms within four industries in Indonesia, as well as the value weights and their evaluation among different high-dynamic industries. The result indicates the importance of development in intellectual capital in several sectors of industries. By using AHP, managers can have a complete image on what is happening inside the selected sector of the firms. On the other hand, they can identify some potential threats and opportunities, they can monitor changes and they can develop future strategies (compared with their competitors and business partners) (Leon, 2016).

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SUPPLY OVERHANG OF AFFORDABLE HOMES: A SURVIVAL ANALYSIS ON HOUSING LOANS APPLICATION

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Abstract

This study aims to investigate the issue of supply overhang of affordable homes and financial exclusion in the Malaysian housing market. It seeks to decipher the issue of unaffordability of homeownership from the financing perspective as offered by the financial institutions in Malaysia. By employing survival analysis via Kaplan-Meier survival estimates for the period covering Q1:2009 to Q4:2014, our findings suggest that higher inflation rate and lower house price volatility may reduce the likelihood for home loans exclusion and thus allow banks to allocate higher loan disbursements. Meanwhile, higher interest rate excludes clients from having access to finance where the compounding effects of interest shows increased hazards of exclusion among the home loans clients. Understanding the determinants of financial exclusion is, therefore, a pertinent issue to be addressed for potential house buyers to be aware of in order to increase the probability of access to financial services. To the financial institutions, identifying the determinants of financial inclusion will assist them to design products that are more marketable. For the policymakers, the findings of the study will shed some light on the policy ramifications towards promoting affordable homeownership in achieving sustainable development goals as outlined by the United Nation.

***Keyword*:** financial exclusion, survival analysis, loan approved, loan applied

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INTRODUCTION

It was reported that there is supply overhang of affordable homes developed by PRIMA[i]. As of November 15, 2017, PRIMA managed to sell only 12,640 units of affordable homes out of 25,132 units open for sale. In Kuala Lumpur (the capital, with the going price greater than RM400, 000, the number of units sold constitutes only 42 percent of units open for sale. BNM also noted that house prices are indeed beyond the mean of the majority of buyers who qualify for affordable homes. There were a lot of rejections for applying for loans because houses are above RM 250,000. These potential buyers are generally excluded from getting access to financing in order to buy homes.

Access to finance is one of the major determinants considered for homeownership. Therefore, homeownership financial inclusion is nested within the ability and capability of an individual to have access to funding. In Malaysia, getting access to funds for a home buyer is a pressing issue. With the spikes of property market prices in the past fifteen years together with vulnerabilities of the economic fundamentals and increasing cost of living relative to the increase in income, the adverse effects on the financing affordability to own homes seems to be more profound. In some scenarios, access to particular financial services is denied even though potential borrowers have established financial relations with a particular lending institution. Understanding the determinants of financial exclusion is, therefore, a pertinent issue to be addressed for potential house buyers to be aware of, in order to increase the probability of access to financial services. To the financial institutions, identifying the determinants of financial inclusion will assist them to design products that are more marketable. For the policymakers, the findings of the study will shed some light on the policy ramifications towards promoting affordable homeownership in achieving sustainable development goals as outlined by the United Nation.

This present paper employs survival analysis on the number of loans application by potential home buyers and approval time of loans by the financial institutions. The financial institutions covered in this study include Islamic Banks, Conventional Banks, Investment Banks and Merchant Banks operating in Malaysia from the year 2006 until 2014. This study also focuses on analysing the increasing gap between loans applied and approved housing loans during the period of Q1: 2006 to Q4:2014 to unravel the link between loans applied and loans approved for potential house buyers.

LITERATURE REVIEW

The issue of home affordability remains perplexing in Malaysia for the past decades and has caught the attention of house buyers, the government, as well as the developers as more and more people are reported to be excluded from financial access offered by financial institutions. The housing policies in Malaysia have evolved over the years through several national development

plans. The objective of the policies is to provide affordable and adequate housing to the low-income and middle-income groups. According to Hawtrey (2009) the term "affordable housing" relates to those who are housed but are in housing stress. However, in Malaysia the affordable house may refer to houses with 'appropriate prices' that may be affordable to be owned by those considered as low income and middle -income groups. As depicted in Figure 1, the housing loan was increasing in up to 2013 but went on a sharp drop in the first quarter of 2014. The following quarters shows the some increment in the number of applied loan but at a slower phase. The above scenario illustrates the exclusion gap of the aggregate home finance in the Malaysian banking sector. Nonetheless, the factors responsible for the exclusion cannot be easily determined from the descriptive trend analysis. Therefore, further inferential analysis is used to assess the major macroeconomic that can predict home financing exclusion in Malaysia.

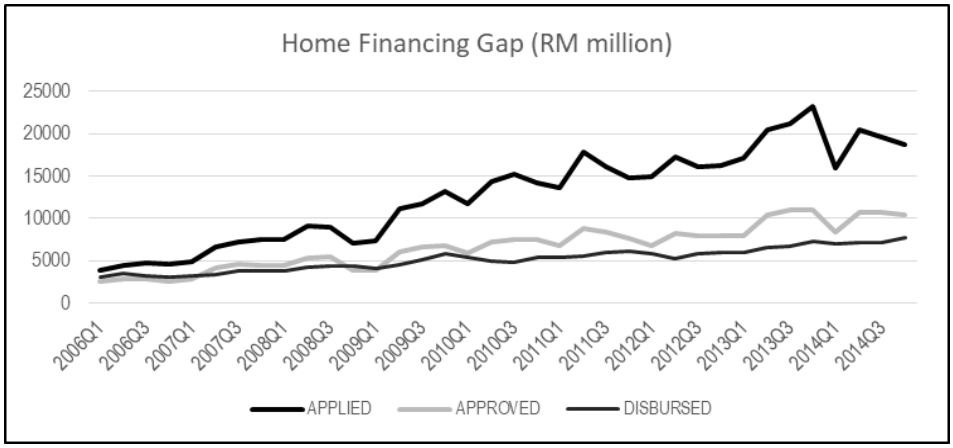

Figure 1: Home financing gap in Malaysia 2006-2014
Source: Bank Negara Malaysia Annual Report (2014)

Based on the current economic condition in Malaysia and the increasing uncertainties in the banking sector, developments in the housing market can have an important impact on financial stability. Rigorous changes in house prices may impact the demand for credit by the households and balance sheets of banking institutions. The uncertain developments in the property sector may lead to excessive lending debt accumulation by both household and developers. Yet, in the event of sharp downward adjustments in house prices, the impact on the balance sheets of banking institutions could be severe, with significant risks to financial instability (BNM, 2012).

Against this backdrop, this paper seeks to examine the effects of both interest and house price index on home financial exclusion in Malaysia since the gap between the applied and approved housing loan is constantly increasing over the period of the study. These two variables are also found to be significant

determinants of housing affordability (Panagiotidis & Printzis, 2015; Wong, Hui, & Seabrook, 2003; McGibany & Nourzad 2004). Debelle (2004) described household borrowing had increased considerably in a number of developed countries over the past two decades, both in absolute terms as well as relative to household incomes. Accordingly, with current Malaysian economic condition, the same impact may now be exerting its pressure for developing countries. In addition, most households having multiple mortgages were found to be very sensitive to small changes in interest rates because of the impact on their incomes and asset prices and this therefore reinforces the income constraints faced by households in Malaysia (Debelle, 2004; Osman, Khalid, & Yusop, 2017). It is interesting to note that no specific past study has looked into the Malaysian scenario in terms of financial exclusion in particular. Yet, this issue relates to the existing complexity of getting mortgage loans among applicants and therefore seeks to answer the question of why the gap between loans applied and loan approved is widening through the years.

DATA

Banks as intermediaries provide home finance based on mortgage principles. Although, rate of interest, lower income of the client, employment status, banks' financial preference among others are some of those factors that lead to home financing exclusion.

The present study also uses a proxy to represent income status based on per capita income as measured by gross domestic product divided by the number of population. The indicator stands as a yardstick to approximate the income level of the productive members of the society. During the period of analysis, the average income per capita stands at RM6, 162.01. However, banks normally consider other factors apart from income and employability of an applicant in granting loans. These factors include interest rate and the purpose of the loans among others. For instance, bankers set a benchmark on the return for home finance based the interest margin in relation to house price changes. As such, the interest rate is also considered a major determinant to loans approval in the conventional system, whereas Islamic banks set house price index as the benchmark in determining the rental index to diminishing partnership of home finance. Thus, as evidenced in The value of our data for house price index was 7.80 percent while interest rate was at 2.89. Despite the lower variation of the interest rate, it will not conclude any inferential power on the parametric analysis at this stage.

Therefore, the study intends to evaluate the effects of both interest and house price index on home financial exclusion in Malaysia. Meanwhile, another macroeconomic variable such as inflation was included in our analysis and was also proxy by consumer price index since home finance relates to buying ability and fluctuation of prices. With this, the maximum inflation rate was about 109.8,

which is close to its average of 104.2. The survival analysis adopted in this study was generated based on time and failure (which in this case, we regard it as exclusion) as explained in the following methodology section. Therefore, in this context, since there is a gap (as illustrated in Figure 1 above) between loans applied, loans approved and disbursed home financing, we apportioned a limit for each of the identified case of financial exclusion. For Case 1, we assumed at least 70% of the number of loans applied as a percentage of the aggregate home financing was approved by the Islamic, commercial and investment banks. Thereafter, we realized that in most cases the 70% was not feasible except in the case of the investment bank, and then we reduced to 60% and even 50% (i.e. half of the amount applied). In this case, for each bank type (Islamic, commercial or investment) that was able to approve the amount applied to 60% scored zero, and otherwise one, to form the exclusion as a dependent variable against time variant. Similarly, we did the same calculation when 50% of the loans applied to get approved by the selected financial institutions.

METHODOLOGY

Survival analysis is commonly used in the banks survival literature, although it is earlier applied in other disciplines such as medical science, biology, engineering, economics, and social sciences. The early application to banking study began with the work of Lane, Looney and Wansley (1986) using non-parametric and parametric of Cox proportionate hazard model. Thereafter, the Cox (1972) model became established to the subsequent banks on time to failure (Whalen, 1991; Wheelock & Wilson, 2000; Pappas, Ongena, Izzeldin, & Fuertes, 2016). The probability application of survival analysis considering the work of Royston and Lambert (2011), the prime three relationships in survival analysis are transformational of survival $S(t)$; to hazard function $h(t)$; and the cumulative $H(t)$ of the hazard function. Furthermore, the loan period to approval time is randomly denoted as T and the application period begins at time $t = 0.$ In a nutshell, their relationship can be expressed as follows:

$$S(t) = \Pr(T > t) \tag{1}$$

Equation (1) represents survival function (meaning the home loan application and its approval) of the client to own a home without experiencing a rejection by the banks. Therefore, an application can be considered as failed if the bank denied the application due to insufficiency of documentation requirement and/or illiquidity of the financial institution to settle the funding request on demand. Therefore, the period in which client makes the application and the conditional period that can lead to the subsequent approval can be expressed as follows:

$$h(t) = \lim_{\delta \to 0} \frac{\Pr(t \le T < t + \delta t \mid T \ge t)}{\delta t}$$
$$= -\frac{d \log S(t)}{dt} \quad (2)$$

Equation (2) is derived from the termed conditional exclusion (failure) rate due to limit interval of time and the possibilities of the loan application to be approved from the application period at an interval time (Cleves, Gutierrez, Gould, & Marchenko, 2010; Rabe-Hesketh & Skrondal, 2012). Likewise, equation (3) expresses the accumulated client's risk of exclusion from the application period to an event (i.e. approval or rejection).

$$H(t) = \int_0^t h(u)du \quad (3)$$

Importantly, $S(t)$ can be expressed as the inverse of $H(t)$ in this form:

$$S(t) = \exp\{-H(t)\} \quad (4)$$
$$H(t) = -\ln\{S(t)\} \quad (5)$$
$$h(t) = f(t) / S(t) \quad (6)$$

However, $1 - S(t)$ is the hazard cumulative distribution function, and the probability density function is expressed as: $f(t)$. An extensive picture of examining the inclusion case begins with the non-parametric survival analysis based on the Kaplan-Meier (Kaplan & Meier, 1958). The Kaplan-Meier non-parametric hazard proportionate analysis is derived as:

$$S(t) = \prod_{t_i < t} \frac{n_i - d_i}{n_i} \quad (7)$$

The Kaplan-Meier survival probability at a time t is $S(t)$, i, referred to individual customer event experiences or right censoring at a time $(i = 1, 2, 3, ...n)$, t_i is the client's censor or inclusiveness times, which is less than t. The notation begins with the client observation n_i at t_i and d_i is the disapproval count. Therefore, the proportionate percentage of client exclusion is utilized at the time of the event (exclusion) in the event where it is below fifty percent or sixty percent for the second analysis. Conversely, the cumulative hazard function is originated from the work of Nelson-Aalen which is expressed as follows:

$$H(t) = \int_0^t h(u)du \quad (8)$$

The cumulative hazard function $H(t)$ is determined by the integration of the exclusion (failure) in a multiplicative term. Furthermore, extending the analysis to parameterization using the macroeconomic covariates is estimated with the aid of Cox model. The Cox model examined the case of financing inclusion in the form survival analysis where the vector of a covariate X influencing inclusiveness of the clients. This covariate includes house price index, interest rate, consumer price index, and GDP per capita. Therefore, the functional equation can be extended with the insertion of other assumptions that will give the real picture of the scenario. With this, let's consider clients $i = 1, ..., n$ and the survival dataset with time to event t and have a tri-variate response (t_0, t, d). The t_0 is the bank's establishment period $(t_0 \geq 0)$, while t is last observation period for the bank $(t \geq t_0)$ and d is the failure indicator which is representing $d = 1$ or right censoring of; $d = 0$. Similarly, adding $\upsilon_i s$ unobserved random effects to the panel is assumed to satisfy the properties of independent and identically distributed (iid) $N(0, \sigma_\upsilon^2)$.

$$h(t_{ij}) = \exp(X_{ij}\beta + \upsilon_i) \tag{9}$$

Following Royston & Lambert (2011), the study extends to investigate the hazard of home finance exclusion using piecewise exponential model:

$$h_{ij}(t / X_i) = \lambda_j \exp(X_i \beta) \tag{10}$$

Banking institutions provide an intermediary role between the economic agents in the society. The surplus and deficit agents of the society meet indirectly through banks to solve their immediate financial needs. Nonetheless, banks have other criteria in which the client must fulfil before loans disbursement. Thus, the disparity between home loans applied and home loans approved is the gap in which can be expressed as funding gap in the literature. Following DeYoung and Jang (2016), home financing gap = loan applied – loan approved > 0.

Positive financing gaps require banks to extend their funding through inclusiveness to reduce homeownership exclusion. Meanwhile, balanced finance between loans applied and loans approved is expected as long as clients fulfil all the requirements for the loans to be approved. Notwithstanding, banks exclusion becomes necessary in the event where loans requirements are insufficient for the banks to approve financing. Similarly, banks decline access to funds due to short of liquidity at their disposal which can be settled through short-term funds mobilization such selling of liquid assets. Therefore, this study creates a benchmark for the net home financing gap at fifty and sixty percent respectively. In a situation where fifty percent of the home loans applied is approved in a particular month, the dummy was coded zero and was coded one if less than fifty percent of home loans applied get approved. Similar coding procedure was

applied in the case where sixty percent of the home loans applied get to be approved. Thereafter, survival method of analysis procedure is employed to estimate financial inclusion which represents the proportion of the survived, while the excluded portion is regarded as those facing hazard.

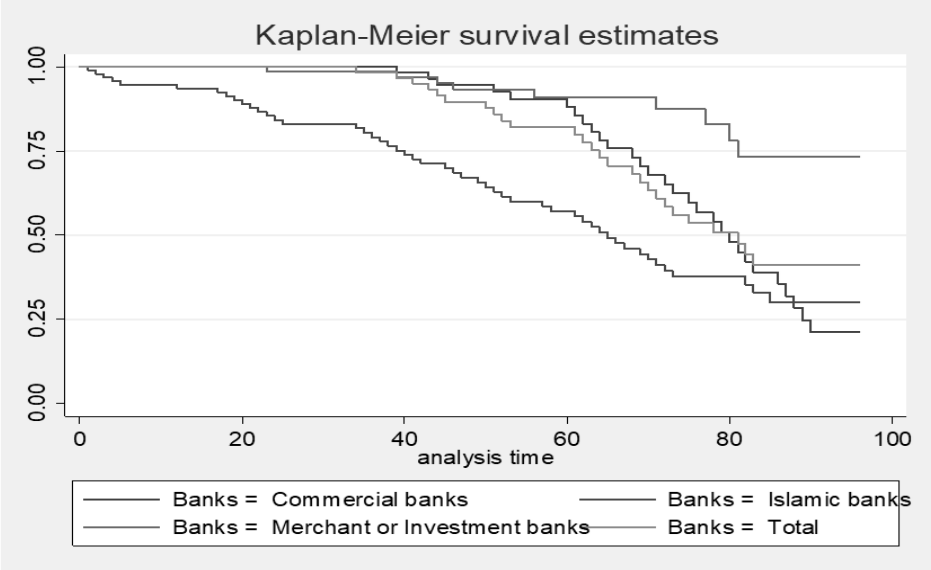

Figure 2: The Benchmark of fifty percent

RESULTS AND DISCUSSION

Our results begin with the non-parametric survival estimates of Kaplan-Meier product limit analysis as depicted in Figure 2. The first proportion of the fifty percent benchmark indicates that Islamic banks failed to provide at least fifty percent those loans applications from the period of January-May 2007. However, more than half of the amount applied through Islamic banks in Malaysia was settled between July and November 2007. As a result, the initial period of Islamic banks exclusion to home financing indicates downward sloping due to their failure to approved at least fifty percent benchmark (i.e. period 1-5). Thereafter, the survival curve becomes horizontally flat between period 6 and 11, and steeps down immediately when the Islamic banks exclude more than half the home finance loans at period 12. The situation continues in the same pattern to all types of banks as when they exclude their clients from financing the curve is declining, while staying horizontally at the time of inclusion.

Figure 2 also highlights the structure of the survival curve estimates of the commercial banks, investment banks, and the total banks. The commercial and investment banks are found to be able to meet up at least fifty percent of their

home finance applications between January 2007 and February 2010 which covered 38 periods. Nonetheless, the commercial banks exclude half of their applied home finance within the range of periods 60-65 (i.e., December 2011-May 2012), 78-83 (i.e., June 2013-November 2013), and 86-90 (i.e., February 2014-June2014). However, the commercial banks in the country were able to approve more than half of the applied home finance from July 2014-December 2014 (i.e., 91-96). However, Malaysian investment banks are often approving more than half of the loans applied due to their business structure and characteristic of their customers which are mostly investment companies. As a result, the survival curve of the investment banks is above all other banks and their customers have a high rate of inclusiveness compared to other banks. In sum, the survival curves illustrate that investment banks are more prompt to approve at least half of the housing loan applied. Consequently, commercial banks perform comparatively better than Islamic banks up to period 85 (January 2014) and since the survival curve of the latter is lower compared to the former. However, an Islamic bank performs much better than commercial banks in terms of inclusiveness between February 2014 and December 2014 (i.e., period 86-96). The performance of Islamic banks at this juncture indicates some improvement in the industry which further necessitate the study to adjust the benchmark to sixty percent in order to explore more information concerning three banking performance (Islamic, commercial and investment banks).

Further analysis investigates the situation on the benchmark of least sixty percent which has excluded investment banks from deeper analysis. Although the trend of the analysis in Figure 3 seems to mimic that of fifty percent, but it serves as a guide in terms of identifying the types of banks that have grant customers more access to home loans. In essence, investment banks have higher inclusiveness of home financing compared to Islamic and commercial banks. Although, the Islamic banks have lower home financial inclusion up to a point where it intersected commercial and aggregate banks around period 81 (i.e., October 2013). After that, Islamic banks perform better than commercial and aggregate of the banks respectively. Consistently with the prior benchmark of the fifty percent, the behaviour of financial inclusion offered by the aggregate banks is similar to that of commercial banks in the later benchmark (sixty percent). Besides, the study extends to investigate the comparison of inclusiveness using survival rate table.

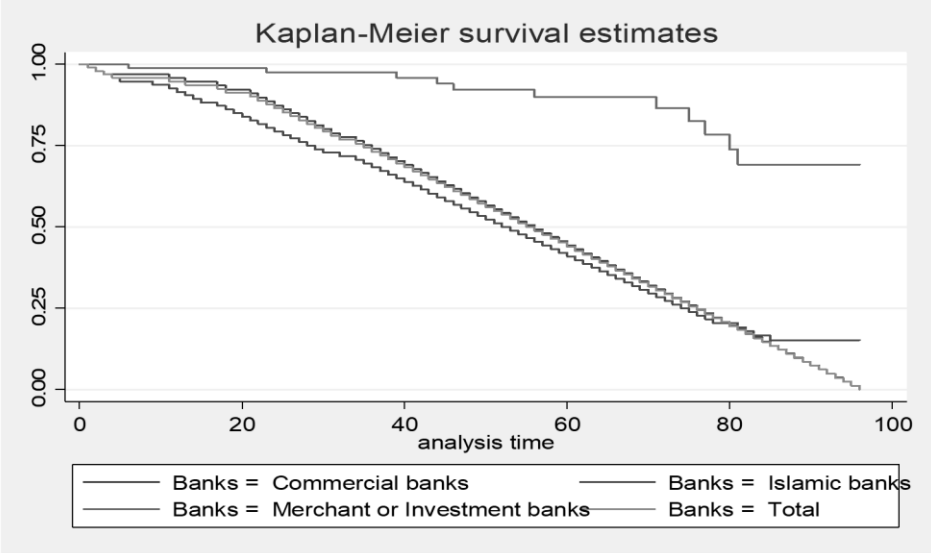

Figure 3: The Benchmark of sixty percent

Table 2 highlights ten outcomes of the inclusive rate per bank based on the allocated benchmark. For instance, the first two months of 2007 indicate that commercial, investment and aggregate banks approved at least fifty percent of home finance applied, that is, it indicates 100 percent, whereas Islamic banks fails approve at least fifty percent of the loans applied.

Table 2: Comparison of the survival estimates

	Fifty percent approved			
Time	Comm.	Islamic	Invest	Aggregate
2007M01	1.0000	0.9896	1.0000	1.0000
2007M12	1.0000	0.9368	1.0000	1.0000
2008M11	1.0000	0.8548	0.9865	1.0000
2009M10	1.0000	0.8182	0.9865	0.9841
2010M09	0.9464	0.6989	0.9512	0.8971
2011M08	0.9047	0.6016	0.9098	0.8208
2012M07	0.7580	0.4604	0.9098	0.7068
2013M06	0.5385	0.3781	0.8311	0.5069
2014M05	0.2475	0.3004	0.7333	0.4119
2014M12	0.2121	0.3004	0.7333	0.4119
Sixty percent approved				

2007M01	0.9896	0.9896	1.0000	0.9896
2007M12	0.9575	0.9154	0.9890	0.9472
2008M11	0.8860	0.8054	0.9756	0.8765
2009M10	0.7645	0.7056	0.9756	0.7562
2010M09	0.6288	0.5804	0.9407	0.6221
2011M08	0.4932	0.4552	0.8998	0.4879
2012M07	0.3576	0.3300	0.8998	0.3537
2013M06	0.2219	0.2049	0.7846	0.2196
2014M05	0.0863	0.1526	0.6923	0.0854
2014M12	0.0000	0.1526	0.6923	0.0000

In the same period, only investment banks are able to maintain sixty percent benchmark whereas the remaining banks experience a shortfall at that moment. However, all the banks under review experience exclusions before September 2010, where none of them are able to approve 100 percent loans at the identified benchmarks of sixty and fifty percent. Consequently, as observed earlier, investment banks performed comparatively better in terms of inclusiveness due to the nature of their businesses and customers' strength. Despite that, the aggregate data of the banks explains the close association with commercial banks behaviour at sixty percent benchmark compared to the fifty percent especially around 2013 to 2014. Islamic banks' inclusion appears lower than that of commercial banks during the month of July 2012, while the bank performed better in the month of May 2014 and December 2014 respectively since it crossed both commercial and aggregate banks values some time in 2013. In sum, despite the performance of the commercial banks in the early stage of the analysis toward inclusiveness, Islamic banks adjusted to better home finance inclusiveness in the most recent period which is closer to their *maqasid shariah* objective (Aliyu, Hassan, Mohd Yusof, & Naiimi, 2017).

Furthermore, apart from inclusiveness consideration through survivability, a hazard of exclusion highlights other findings which are also extended through piecewise exponential model. At this moment, the study focuses on the exclusion recurrence possibilities using dummy covariates of the study periods. Table 3 depicts the exponential outcomes of the quarterly hazard of exclusion for Islamic, commercial and aggregate banks based on sixty percent benchmark. Our findings on the dummy covariates reveal similar significant coefficient immediately after the first quarter of 2009 except few cases of Islamic banks. The coefficients of the hazard of exclusion by time predicts the same results to the three different banks due to similar dummy prediction of attaining sixty percent benchmark applied to all banks. Our findings reveal that Islamic banks was able to approve up to sixty percent at the month of March 2009, which

also affect the aggregate of banks to have higher percentage after adding with commercial banks.

In the third quarter of 2013, the performance of the Islamic banks recorded more than sixty percent of the home finance is approved whereas the commercial banks exhibit consistent hazard exclusion between 2009q2 and 2014q4. Consequently, Islamic banks illustrate inclusiveness at the last three observation periods (2014q2-2014q4). The probability of not having the exclusion recurrence is increasing throughout the trend of our results. For instance, at period 2009q1 the inclusion rate is 85 percent exp (-0.167 x 1), while the exclusion hazard values are continuously reducing at time variation up to period 2013q2 which accounted for 96 percent exp (-0.0455 x 1). Meanwhile, commercial banks maintained the inclusion probability at 96 percent at 2013q3, whereas Islamic banks were able to approve more than sixty percent of the applied housing loans.

Table 3: Hazard of exclusion by time

Time	Islamic Bank	Commercial Banks	Aggregate Banks
2008Q1	1.000	6.02E-08	1.96E-08
2008Q2	0.500	0.500	0.500
2008Q3	0.333	6.02E-08	0.333
2008Q4	0.250	0.250	0.250
2009Q1	0.200	0.200	0.200
2009Q2	0.167*	0.167*	0.167*
2009Q3	0.000	0.143*	1.96E-08
2009Q4	0.125**	0.125**	0.125**
2010Q1	0.111**	0.111**	0.111**
2010Q2	0.1000**	0.1000**	0.100**
2010Q3	0.0909**	0.0909**	0.0909**
2010Q4	0.0833**	0.0833**	0.0833**
2011Q1	0.0769**	0.0769**	0.0769**
2011Q2	0.0714***	0.0714***	0.0714***
2011Q3	0.0667***	0.0667***	0.0667***
2011Q4	0.0625***	0.0625***	0.0625***
2012Q1	0.0588***	0.0588***	0.0588***
2012Q2	0.0556***	0.0555***	0.0556***
2012Q3	0.0526***	0.0526***	0.0526***
2012Q4	0.0500***	0.0500***	0.0500***

2013Q1	0.0476***	0.0476***	0.0476***
2013Q2	0.0455***	0.0454***	0.0455***
2013Q3	0.000	0.0435***	0.0435***
2013Q4	0.0417***	0.0417***	0.0417***
2014Q1	0.0400***	0.0400***	0.0400***
2014Q2	0.000	0.0385***	0.0385***
2014Q3	0.000	0.0370***	0.0370***
2014Q4	0.000	0.0357***	0.0357***
Obs.	28	28	28

***p<0.01, **p<0.05, *p<0.1

It is worth noted that, in the most recent time, Islamic banks are consistently trying to abide with the inclusiveness that reaches at least sixty percent of the applied amount, which constitutes part of their *maqasid shariah* objective compliance of their establishment in the last three-quarters of our sample. In contrast, though inclusiveness to sixty percent of housing loan approved was increasing at the side of commercial banks, but efforts are required to fill up the 4 percent hazard of exclusion during the last three periods of our sample. Nonetheless, apart from time-dummy of exponential analysis, the study extends parameterisation of macroeconomic covariates.

The results shown in Table 4 demonstrate the implications of macroeconomics covariate effects on the home finance exclusion. At this stage, the study uses quarterly observations due to the insufficiency of most frequent data. There are a few important points that prevailed from the above analysis. Firstly, it describes how inflation reduces the likelihood of home loans exclusion since banks increase loan disbursement during inflation with an expectation to gain more returns from customers. Therefore, banking institution allocates higher financing to their clients during inflation with a substantial increase of interest rate. Meanwhile, interestingly the above findings from both the Islamic banks, commercial banks, the aggregate of banks models concur with the previous studies that high-interest rate excludes clients from having access to finance. The compounding effect of the interest shows increase hazards of exclusion among the home loans clients. The analysis also describes a lower volatile house price index encourages banks to distribute loans to clients especially in an economically stable environment. Stability of house price index reduces hazard of client exclusion to loans and increases chances for the client to be inclusive and have access to home ownership. Lastly the findings which reaffirm that income remain an integral component to home ownership via approved loans by financial institutions. Income normally is based on the employability status and is also used to gauge the amount to be loaned out.

Table 4: The Survivability of home financing inclusiveness

	Islamic banks			Commercial Banks			Banks aggregate		
Financial exclusion	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8	Model9
CPI	-0.543***	-0.029	-0.268	-0.573***	0.537*	0.123	-0.573***	0.365	0.107
	(0.193)	(0.328)	(0.360)	(0.202)	(0.324)	(0.383)	(0.202)	(0.356)	(0.377)
INT	2.857***	2.017*	3.570**	2.744**	-0.054	1.310	2.744**	0.831	2.391
	(1.065)	(1.205)	(1.584)	(1.159)	(1.584)	(1.741)	(1.159)	(1.341)	(1.697)
HPI	-0.420**	-0.492**	-0.133	-0.396**	-0.628**	-0.237	-0.396**	-0.459**	-0.053
	(0.194)	(0.217)	(0.309)	(0.188)	(0.270)	(0.339)	(0.188)	(0.230)	(0.334)
GDPC	-0.004***	-0.003**	-0.004**	-0.004***	-0.003**	-0.004**	-0.004***	-0.003**	-0.003**
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
CCRT		1.021**	0.692		1.748***	1.272**		1.694***	1.330**
		(0.475)	(0.500)		(0.560)	(0.586)		(0.549)	(0.567)
UNEMP			7.592*			8.346*			8.134*
			(4.466)			(4.571)			(4.758)
OBS.	28	28	28		28	28		28	28

seEform in parentheses
*** p<0.01, ** p<0.05, * p<0.1

CONCLUSION

For the past few years, affordable home ownership has been considered a challenge for policy makers in Malaysia. Despite many programmes launched by the Malaysian Government, few have succeeded in providing solutions to this complex issue. The government has announced the need for banking institutions to play a more active role in providing more flexibility in mortgage loans. This study proved that banks are able to provide inclusions to home buyers but at the same time uncertainties in the economy may result in downward trend of loan approval. A financial system normally provides loans to society based on societal needs. However, the challenges in the economy certainly have contributed towards the expansion in the gap between the applied and approved housing loan. There are a few important points provided by the above analysis.

1. It describes how inflation reduces the likelihood of home loans exclusion since banks increase loan disbursement during inflation with an expectation to gain more return from customers. Therefore, banking institution allocates higher financing to their client during inflation with a substantial increase of interest rate.
2. Interestingly the Islamic banks, commercial banks, aggregate banks, and the pool banks models confirm that high-interest rate excludes clients from having access to finance. The compounding effect of the interest shows increase hazards of exclusion among the home loans clients.
3. The analysis also describes a lower volatility house price index encourages banks to distribute loans to clients especially in an economically stable environment. Stability of house price index reduces the hazard of client exclusion to loans and increase chances for the client to be inclusive and have access to home ownership.
4. The findings conclude that income as an integral component of home ownership and are also a requirement considered for loans to be approved. The applicant's income is determined based on the employability status and is used to gauge the amount to be loaned out.

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[i] Perbadanan PR1MA Malaysia was established under the PR1MA Act 2012 to plan, develop, construct and maintain high-quality housing with lifestyle concepts for middle-income households in key urban centres.

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THE NEXUS BETWEEN HOUSING GLUT, ECONOMIC GROWTH, HOUSING AFFORDABILITY AND HOUSE PRICE IN MALAYSIA

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Abstract

This paper analyses [1] the relative impact of housing affordability, housing prices and gross domestic product on housing glut, [2] the effects of housing glut on the health of housing market and then [3] suggestion of solutions to mitigate the risks of housing bubble bursting. Results show that housing affordability and housing price exert very mild effect on housing glut contrary to the common belief that these two factors have significant effect on housing glut. In terms of number, our results show that economic growth contributes about 0.15 negative impact on housing glut for every unit increase in economic growth while each unit increase in housing price can increase housing glut as much as 0.0054 unit.

Keyword: Housing glut, affordability, imbalance in supply and demand

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INTRODUCTION

Housing glut can bring about serious damage to the economy as it can lead to rampant default of bank loan repayment, rising abandonment of ongoing housing projects due to weakened capacity of the developers in servicing their bridging loan following poor sales and a host of other disruptions within the industry and also other related industries (Himmelberg, Mayer, & Sinai, 2005). While lenders would take a more cautious stance and as a result causing a credit crunch, buyers take a wait and see position as they expect prices to fall, thus further reducing sales. The ultimate consequence could be a collapse of house prices or the bursting of the housing bubble that inexorably brings about a financial crisis (Yip, Wong & Woo, 2016).

Much research has been done on the causes of and offer solutions to overcome the housing affordability issue, for example Angel, Mayo and Stephens (1993), Angel (2000), Paris (2007), and Gabriel, Jacos, Arthurson, Burke and Yates (2005). However, none of these aforementioned papers have looked into the relationship between housing affordability and housing glut, and their correlation with other factors like housing price and economic growth so that a clearer picture of the housing affordability dynamics can appear and hence, correct remedial policy action can be taken to alleviate the housing affordability problem and thereby mitigates the housing glut problem.

This paper aims to shed some light on the nexus between housing glut and the factors of housing affordability, housing price and economic growth. Specifically, this paper analyses [1] the relative impact of housing affordability, economic growth and housing prices on housing glut using economic analysis and statistical modelling, [2] the effects of housing glut on the health of the housing market using logical deduction and intuition, and then [3] suggestion of solutions to mitigate the risks of the bursting of the housing bubble.

Malaysia is currently facing a residential property glut with oversupply at its highest level in a decade (Bank Negara Malaysia, 2014). If unchecked, can these imbalances lead to property market crash as experienced in 1998? The logical question to ask is therefore: What level of housing glut is considered as serious enough to cause housing market crash if it can cause housing market crash at all? We attempt to answer this question using logical deduction, regression technique and economic analysis. Finally, to overcome the problem of high level of residential units overhang, we analyse three policies options, namely encouraging rental market, increase efficiency in provision of affordable homes and raising efficiency in allocation of affordable homes.

The rest of the paper is organized as follows: Section 2 provides research background, followed by an economic and logical analysis of each of the factors that influences housing glut. Next, the empirical analysis followed with the conclusion for this paper.

RESEARCH BACKGROUND

Literature on housing affordability abounds and the established studies are basically driven mainly by the need to provide more affordable housing. However, literature concerning housing glut and its potential devastating effect is yet scarce. In recent years, many nations, advanced and emerging economies alike have explored the approach of using statutory land-use planning system to implement the provision of additional affordable housing more effectively (Paris, 2007). With intent focus on the method to provide more affordable housing, the efforts have overlooked the fact that as supply is being intensified, it may reach the state when supply exceeds demand, and in the event of this scenario, prices will readjust themselves downwards resulting more houses become affordable because prices are coming down fast. Many of these articles focused on how best to address the affordability issue (Gabriel et al., 2005; Burke et al., 2007; Yates, Wulff & Reynold, 2004; Beer, Kearins, & Pieters, 2007) but missed out the dramatic effect of when the supply rate of houses outpaces demand. All these aforementioned research papers concentrated on solutions for the housing affordability problem but failed to investigate the correlation between the main factors especially housing glut, housing prices and economic growth on housing affordability. This state of housing affordability issue is found in many countries including Malaysia.

Meanwhile, Lawson and Milligan (2007), specifically for the case of Australia at national level, discussed that there is a marked increase in using new strategies to promote new investment in affordable housing to low and moderate-income households. Then we have the provision contained in Section 106 of the Town and Country Planning Act 1990 in England that calls for contribution by a developer to affordable housing as a consideration and condition of planning approval. Gurran, Milligan, Baker and Bugg (2007) revealed that the existence of social housing grant exerts a positive impact on the viability of a site for affordable housing by reducing the impact of a social housing target on residual land value. Additionally, the authors also pointed out that in Ireland, national legislation was introduced through the Planning and Development Act (2000) to enable local authorities to require developers to contribute to social and affordable housing. The enactment of this legislation is based on the application of planning gain mechanisms to deliver housing for rent and sale to low income households (Norris & Shiels, 2007).

The above literature review suggested that housing policy followed by many countries is to provide incentives to developers to build more affordable homes and at the same time, steps are taken not to stress the perfect free housing market. However, none of the articles mentioned the effect of the rate of supply of housing whether high-end, medium level or affordable level. So there is a discernible gap in the literature.

THE MACRO-VARIABLES: HOUSING GLUT, HOUSING AFFORDABILITY, HOUSING PRICE AND ECONOMIC GROWTH

We use logical deduction, common sense analysis coupled with economic analysis to analyse the four important macro variables in a housing market: housing glut, housing affordability, housing price and economic growth. The reason for this analysis is that it is expected that all these four macro variables are interrelated to one another in some way and thus makes regression results not robust and therefore raises the need to be reinforced by qualitative analysis and the application of special regression technique that is instrumental variable regression.

Housing Glut

Bank Negara Malaysia has stated that Malaysia is facing a serious residential property glut, the highest level since a decade ago. Of the total unsold units, 61% are high rise properties of which 83% are of price RM250,000 and above. Two logical deductions can be made from these two percentages.

The percentage of 83% suggests that many of the potential house buyers cannot afford prices above RM250,000. If we use the definition of affordability being no more than 3 times the annual income of the household, then to be able to afford the price of RM250,000, the combined monthly income of the household would be about RM7,000.00. However, as shown in Figure 1 below, only 14.6% of the total households fall within the monthly income bracket of RM6,000 – RM7,999. Figure 1 also shows that households with earnings more than aforementioned monthly income bracket make up a total of 35.2% from the total households in the country. This suggests that only 35.2% of the national households can afford houses with price of RM250,000 and above. Thus, the question arises as to why the unsold houses were built in the first place? Have these developers not conducted prior market research before launching their projects? A further question is whether the housing price of RM250,000 suggests that houses of this price are the socially accepted minimum standard of housing.

The second percentage of 61% represents the unsold high-rise units. The lack of buying response could be due to unaffordable prices or unappealing physical characteristics of the units, the buildings, poor connectivity and amenities at the location and other features. Such scenario also suggested the possible lack of prior comprehensive understanding and consideration on market requirements and development on the part of the developers.

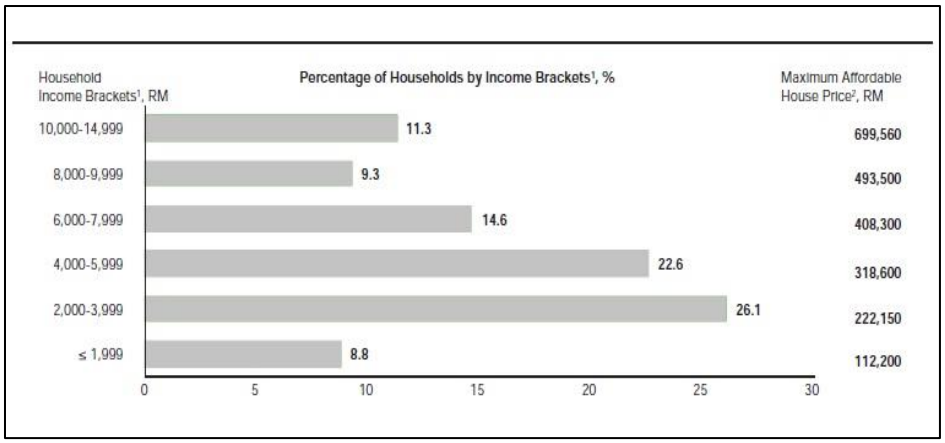

Figure 1: Housing affordability by income levels
Source: BNM Quarterly bulletin-3rd Quarter 2017

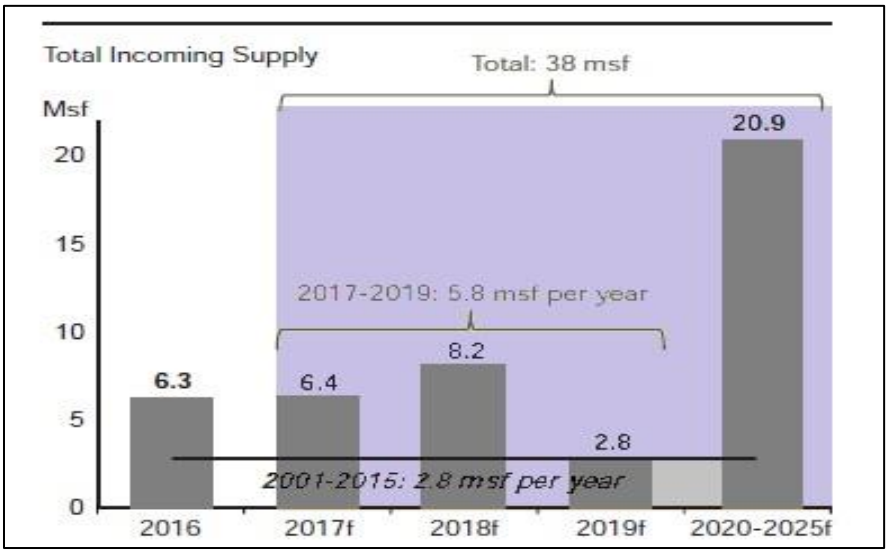

Figure 2: Annual incoming supply from 2017-2019
Source: BNM Quarterly bulletin-3rd Quarter 2017

It is noted from Figure 2, the annual incoming supply of housing for 2017-2019 (3 years) is more than double of the past 15 years. When estimating the incoming supply based on projects in the planning stage, new supply is predicted to enter the market by as much as 45% in 2020 and 55% in 2021. The oversupply of houses of all types including affordable houses increases tremendously for the coming 5 years. Without correction on the supply-demand mismatch, this will likely exacerbate the housing glut issue. What is the reason

behind this rather confusing state? Conventional wisdom would point to lack of coordination between developers and government agencies and/or understanding of consumer demand trend – current and projected over the next 2-3 years.

Housing Affordability

Many countries including Malaysia are experiencing housing affordability problem which effectively means consumers do not have the purchasing capability to acquire the property that they can set up a liveable home. Hence, the problem is we need a house which is socially accepted with a minimum level of standard of housing (SAMASH) and available at affordable price to the potential buyer. SAMASH is different in different locations and countries and it changes with respect to time and economic development of the country. It is the key to housing affordability problem. To date, there is no consensus as to what constitutes SAMASH. It depends on the public perceptions of what constitute socially minimum acceptable standard of housing and also on the quantum of income level increase which is propelled largely by strong economic growth. This trend of analysis is in line with World's senior housing specialist Dao Harrison, who proposes that more detailed data should be collected from consumers to understand the true need for affordable housing in Malaysia and surveys should be done by a third party every 2 to 3 years.

Figure 3 displays the housing affordability index graph which suggests that Malaysia faced no housing affordability problem over the period 1990-2009. The problem has surfaced since around 2009. This computation in Figure 3 is based on the recognized notion that when housing after the affordability index less than 130, housing affordability issue will develop.

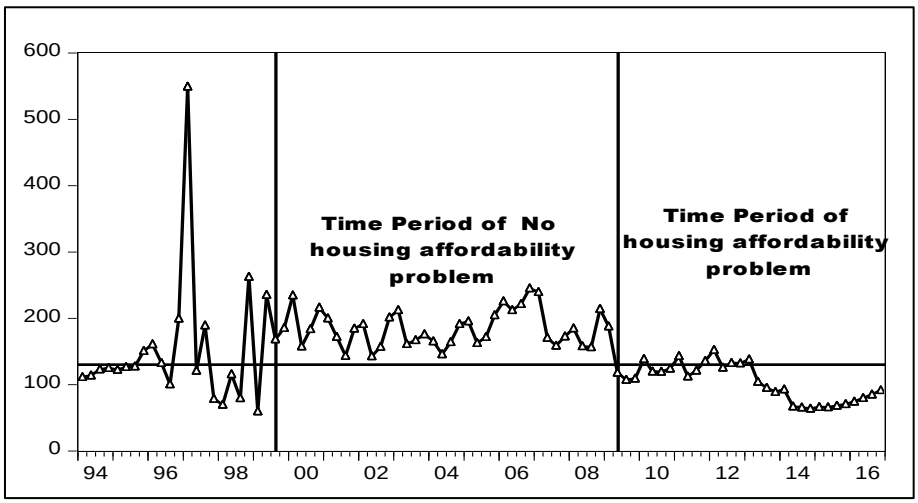

Figure 3: Housing affordability problem
Source: BNM Quarterly bulletin-3rd Quarter 2017

The second issue is housing affordability index has various definitions. We should analyse these definitions and adopt the definition that is most suitable for the Malaysian context.

Housing Price

Between 2001 and 2005, house prices in Malaysia increase by an average of 7.3% per year or 29.2% over the course of 5 years. Over the following 5 years between 2006 and 2010, house prices in Malaysia shot up by an average of 6.1% per year or an accumulated 24.2%. By contrast, from 2010-2012, national real house prices grew by 9.4% per year or 37.6% over the 5 years period. This is more than 30% increase in the annual rate of appreciation when compared with the previous 12 years (2001-2012). This increase of 7.3, 6.1 and 9.4% are rather steep in comparison with the United States market over the ten-year period from 1995-2004, when national real house prices grew at an annual average of only 3.6% (Himmelberg et al., 2005). The house price trend in the Malaysian market over the past 10 years is a worrying phenomenon because it is a vital sign of a protracted booming market, the building up of a housing bubble. And history shows that a collapse or burst will very likely follow. A bursting of a housing bubble poses a very significant risk to the national economy, causing economic and social damage, adversely impacting the banking system, household consumption and the real economy of the nation. Figure 4 shows the price increase from 2010 to 2013 are comparatively not as sharp as the spikes in the 1990s and from 2013-2014, the fall is not as rapid as the one in 1998.

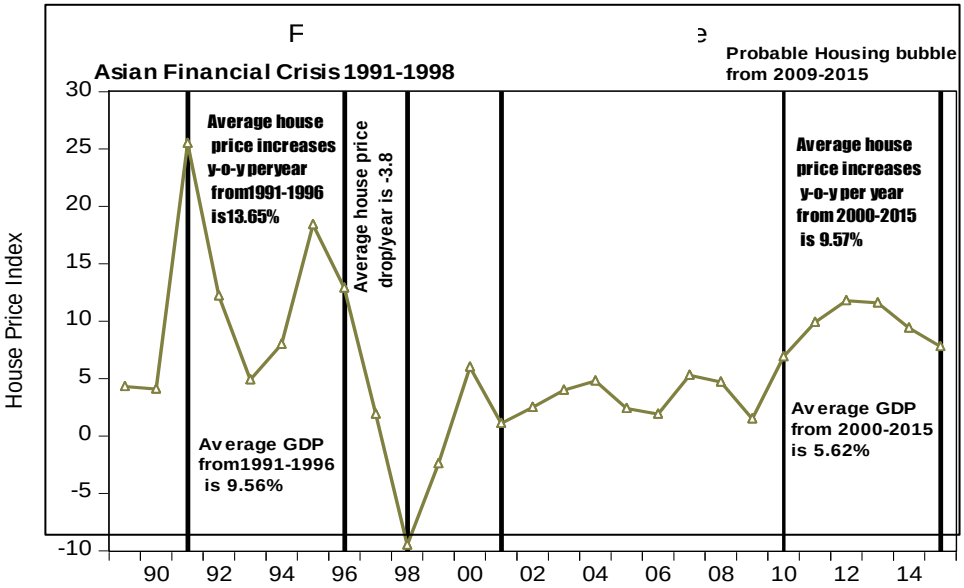

Figure 4: Increase in housing price

The questions are: Can this moderate boom and burst period deteriorate into a severe boom and burst episode? What are the dynamics of the housing prices for this period? Can a severe housing glut turn this housing cycle into a bubble?

Economic Growth

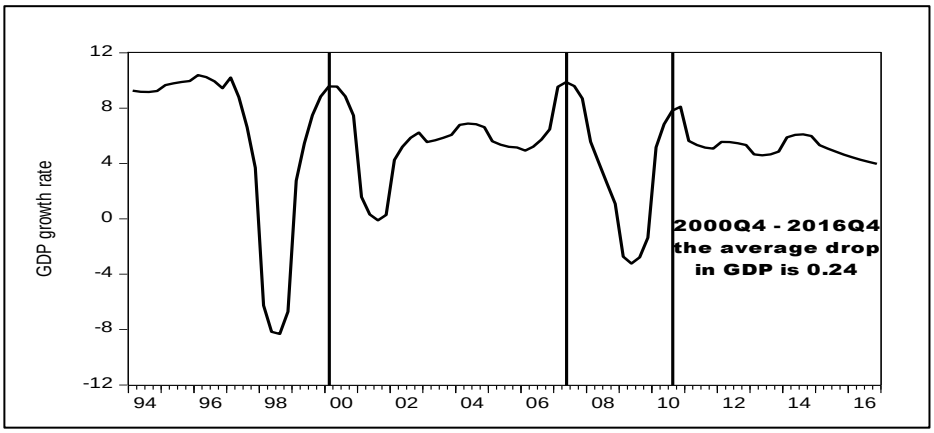

Figure 5: GDP growth rate

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Economic growth (GDP) is the key measure for the economic health of a country. It provides a measure for the household average income. Comparing Figures 3 and 5, we see a downward trend of GDP growth rate that roughly coincides with the period of housing unaffordability for the recent period starting from 2010. It gives an indication that housing affordability, and housing glut are correlated with economic growth as well as housing prices. However, situation like this is true only in big cities like Kuala Lumpur and Penang.

RESEARCH METHOD

In the preceding section, we have discussed the correlation between the four variables - housing glut (HG), housing affordability (HA), housing price (HP) and economic growth (EG). As they are correlated with one another, we cannot use normal regression technique without modification. We trace the correlation matrix for all the four variables. Next, we look for four instruments and then conduct instrumental regression of housing affordability, housing price and economic growth on housing glut.

We have three independent variables and we use two suitable instruments on the simple regression of housing glut on housing affordability, then housing price and next economic growth separately. We test for over identification by using J test. Through literature review and statistical testing, we identify four

instruments: Consumer sentiment index (CI), Kuala Lumpur composite index (KI), Exchange rate (RM/USD) (ER), Oil price (OP).

The formula for the instrumental variable regression is shown in the appendix. The first stage of computation is illustrated by equation (2a), (2b) and (2c) while the second stage of computation is represented by equation in Model 1, 2 and 3. All three are simple linear regression models but computed using two stage least square estimation technique in order to avoid simultaneity, serially correlated and heteroskedastic problem.

EMPIRICAL ANALYSIS AND CONCLUSION

Table 1 shows the results when model 1, 2 and 3 are run by using two stage least square estimation method. The results show that when housing affordability improves by 1 unit, housing glut will decrease by 0.0061 unit, which is small by magnitude. But nevertheless, it shows that improving housing affordability, housing glut will be lessened. On the other hand, housing price exerts a positive impact on housing glut by as much as 0.054 unit for every unit increase in housing price. As for economic growth, housing glut will decrease as much as 0.15 if economic growth picks up by 1 unit. This shows that economic growth has a tremendous effect on housing glut, which is understandable as we know that strong economic growth will increase the level of income and thus increase the financial ability of the people to purchase their own house.

Table 1: Two stage least square estimates of the impact of housing affordability, housing price and economic growth

Dependent Variable: Housing Glut

Regressor	Model 1	Model 2	Model 3
Housing affordability	-0.0061(0.00)	-	-
Housing price	-	0.0054(0.00)	-
Economic growth	-	-	-0.15(0.00)
intercept	11.93(0.00)	10.24(0.01)	11.82(0.00)
Instruments variables	CI, OP	CI,OP	CI, D(OP)
First stage F statistics	32.54	55.58	6.18
p(J statistics)	0.301	0.134	0.054

Note: CI = Consumer sentiment index, OP = Oil price, D(OP)= first difference of oil price
Values in the parenthesis are p-values for testing significance

These three models are significant since J statistics return the result not rejecting both instruments are exogenous and also F statistics for model 1 and 2 are more than 10, confirming that the instruments are strong. However, for model 3, the instrument is weak as F statistics is less than 10 (6.18). Housing affordability will decrease housing glut by a very small percentage (0.061%). This suggests that housing glut is mildly affected by the insufficient supply of

affordable housing contrary to what is presented currently by researchers of property agencies. The same situation applies to the factor of housing price which therefore may not be a main cause of housing glut. Hence this brings the conclusion that housing glut is mainly caused by the lack of proper coordination among the various players in the housing market.

GRAPHICAL ANALYSIS

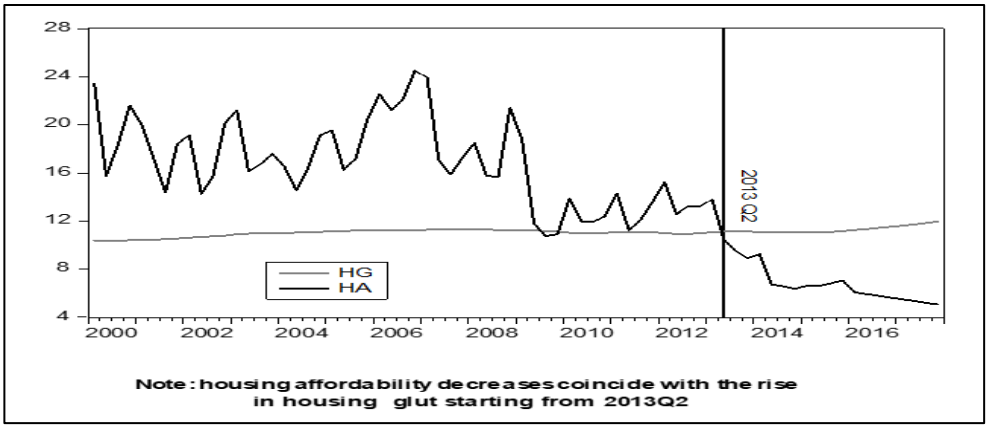

Figure 6a: Housing glut (HG) versus housing affordability (HA)

Figure 6a shows the graph of housing glut with respect to housing affordability. The graph shows that from 2013Q2 onwards, as affordability decreases, housing glut increases. This is in line with our finding using instrumental variable regression analysis as shown in Table 1.

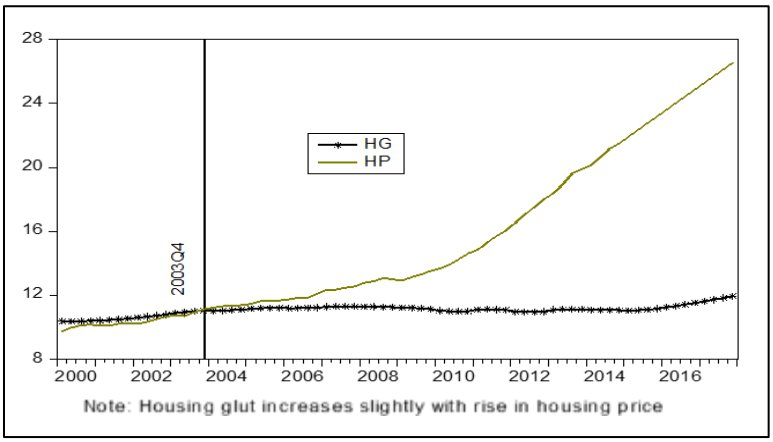

Figure 6b: Housing glut versus housing price

With regard to the relationship between housing glut and housing price, from 2003Q4 onwards, as housing price increases, housing glut moves up only slightly. This debunks the fact that higher housing price is the main cause for housing glut. The graph analysis results corroborate this point that higher housing price can cause slight increase in housing glut only as shown in Figure 6b.

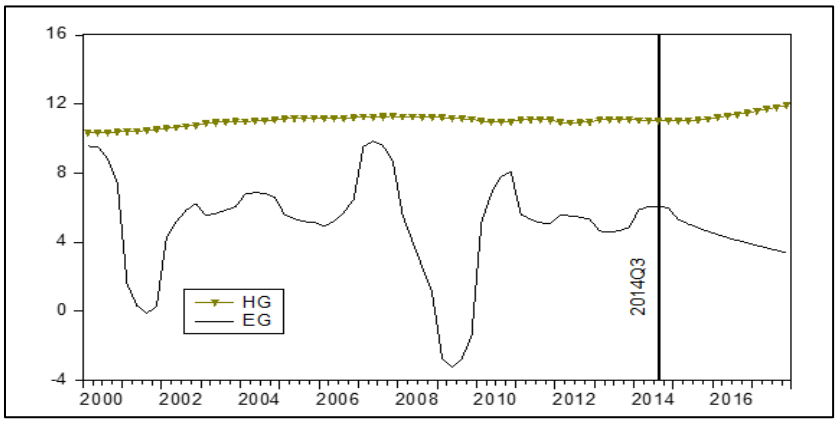

Figure 6c: Housing glut versus economic growth

Figure 6c shows that as economic growth decreases, housing glut starts to rise commencing from 2014Q3 to the current time. The above graphical results are in line with the instrumental variable regression results. Thus, the conclusion is housing price, housing affordability and economic growth do not influence housing glut significantly.

CONCLUSION

It is common to hear that housing glut is caused mainly by spiking up of housing prices and that the developers do not build enough affordable homes. However, the empirical results, graphical and economic analysis from this study suggest otherwise. In fact, housing affordability can affect housing glut in a very small way, roughly 0.0061 unit negatively while housing prices can only impact housing glut by a mere 0.0054 unit positively. Furthermore, the results show that economic growth affect housing glut as much as 0.15 unit in a negative way. Another conclusion is that housing glut cannot cause bubble and at worst, it makes the housing market softer only. Finally, from the analysis and interpretation of the results of our study, we are of the opinion that housing glut is basically caused by developers moving into the housing market without first conducting rigorous housing market demand and supply research to determine the saleability of their projects. The mismatch between supply and demand requirements creates more and more units of unsold houses. Another reason contributing to the mismatch could be traced to the fact that the normal lead

period between submission of application for a development project and official approval is quite long, about 2 years. Within these 2 years, the state of the economy may have changed due to external and internal uncontrollable factors. This is indirectly illustrated by the fact that the incoming housing supply increases tremendously despite softer market as shown in Figure 2. T. Based on this research finding, it is suggested that consumer housing demand survey to be conducted every two to three years and must be conducted by a third party so that the actual state of the housing market on the ground is known. Based on the results of our studies, we would suggest that biennial surveys be carried out by appointed institution of higher learning to collect relevant data such as consumer housing demand, financial capacity and such data should be available to developers and government agencies in their planning for housing policies and development projects.

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APPENDIX

The Instrumental Regression Model:

$$HGi = \beta 0 + \beta 1\ HAi + ui \quad \text{(Model 1)}$$

$$HGi = \beta 0 + \beta 2\ HPi + ui \quad \text{(Model 2)}$$

$$HGi = \beta 0 + \beta 3\ EGi + ui \quad \text{(Model 3)}$$

$$HAi = Л0 + Л1CIi + Л2KIi + Л3ERi + Л4OPi + vi \quad \text{(2a)}$$

$$HPi = Л0 + Л1CIi + Л2KIi + Л3ERi + Л4OPi + vi \quad \text{(2b)}$$

$$EGi = Л0 + Л1CIi + Л2KIi + Л3ERi + Л4OPi + vi \quad \text{(2c)}$$

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THE SAFE AND NURTURING LIVING ENVIRONMENT FOR URBAN CHILDREN

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Abstract

As an inheritor of the nation's future, children should be given the assurance to live and grow in the best possible environment. It is our dream that they would become a persevering, progressive and as well as a well-behaved generation both physically and mentally. In order to achieve that, it is important for the children to be provided with a safe and secure environment to grow up. The research objective is to identify the characteristics of safe and nurturing environment for urban children. The data were collected through focus group interviews with children age 10 and 11 in a research participatory workshop in Sekolah Kebangsaan Seksyen 7, Shah Alam. There were 28 students involved in the workshop. The results indicated the two significant characteristics that promote a safe and nurturing environment for children to roam freely are positive parents and community support.

Keyword: Children, safety, nurturing, living environment

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INTRODUCTION

Today, reading or listening about crime against a child in the radio, newspaper, television or even online websites have become very common. Statistics from the Bukit Aman Sexual, Women and Children Investigation Division disclosed that there were 3,223 missing children under the age of 18 from the year 2008 until April 2011. However, only 1,708 cases were resolved. In 2015, 1,782 cases of missing children were reported and as in January 2016, 140 cases have been reported (The Star, 2016).

The problem of paedophiles has also become more apparent in the recent years in Malaysia. As mentioned by Marret, Satar, and Ismail (2013), the police have highlighted that the cases of missing children may be connected to human trafficking, which in most cases involve the sexual abuse by paedophiles, trading for slavery, forced child labour or money-making sexual works. Hence, parents nowadays are more hesitant to let their children to roam free and play outdoors, as they may be exposed to various hazards such as accidents, the acts and bad intentions of other individuals.

This research seeks to address the issue with a particular focus on safety and nurturing environment for urban children and to have a deep understanding of children's outlook and actions on the issues involved. This study will be a significant endeavour in the literacy of children's environment in the context of urban neighbourhood.

LITERATURE REVIEW

Over a billion kids are experiencing their childhood life in urban areas today, and the number keeps on increasing in the coming years. It is almost two decades now since UNICEF and the United Nations Human Settlements Program together propelled the Child-Friendly Cities Initiative including progressive approaches and systems to address the requirements of kids in urban communities. However, numerous difficulties remain. Growing Up in Cities (GUIC) is a program that involves children in evaluating their urban environments and planning how to improve the conditions of their lives (Chawla, 2002). With the fundamental goal of influencing public policies through the inclusion of children's perspectives, it seeks to build broad alliances of committed people in taking action on children's behalf in community-based and non-government organizations and across different sectors of government.

Nowadays, children's voice in determining the direction or concept of urban planning is becoming more and more important, and this can be exemplified by Malone (2013) through a project in Sydney. This exercise should be conducted more often in Malaysia in response to the needs and aspirations as outlined in the Vision 2020, i.e. what we build today, will be inhabited by today's younger generation in the future. To support this initiative into the real practice project, United Nations Child Friendly City International Secretariat was

established by UNICEF in Florence (Riggio, 2002). Furthermore, other initiatives comprise of the introduction of school gardens, community gardens (Armstrong, 2000), lower speed limits, traffic calming (Pucher & Dijkstra, 2003), walking school buses and safe routes to school campaigns (Watson & Dannenberg, 2008). In supporting these reversing trends, Gleeson and Sipe (2006) supported the child friendly cities and Capon and Blakely (2008) strengthened them as 'healthy cities'. Furthermore, in 2010, the New York City Streets Renaissance Campaign has been organized to reclaim streets as places to play for children (Kaboom, 2010).

Environmental child-friendliness might be threatened by shrinking open spaces, increasing traffic levels and limited independent mobility due in part to social aspects such as adults' safety fears (Bjorklid & Nordstrom, 2007). The world is currently heading to the trend of children growing up within the confines of the four walls of their homes, rather than being adventurous outdoors. This trend is particularly popular in the Western countries (Skar & Krogh, 2009). As this is considered as very unhealthy, actions must be taken by those who are responsible and have the power to stop this from taking a worse turn (Bell, Wilson & Liu, 2003; McAllister, Lewis & Murphy, 2012). Most importantly, the inclusion of children's views in the planning and decision making is deemed necessary (Elsley, 2004; Bjorklid & Nordstrom, 2012).

Foster et al. (2015) identified the factors that shape parents' perception in fear of stranger that their child might be approached, taken or hurt by stranger. In this framework, the attributes that worsen or ease parents' concerns on their children's safety mainly focused on fear of stranger harm and perceived risk from stranger. Neighbourhood design also plays a role in promoting community safety and might impacting parental fear. Jacobs (1961) wrote that a well-used city street is apt to be a safe street and to achieve this function, it requires a substantial quantity of stores and public spaces sprinkled along the sidewalks (Jacobs, 1961). This mix of local destinations can attract more people to the neighbourhood which increases natural surveillance and the additional 'eyes on the street' are thought to help minimize crime and fear of crime (Jacobs, 1961). Some neighbourhoods has been designed to be integrated with the shopping precincts, making them less of a possible crime setting (Foster, Giles-Corti & Knuiman, 2010). More often than not, strangers are welcome here as they offer the natural surveillance into the area (Hillier, 2004). Numerous studies suggested that the presence of other people can limit fear of crime (Jorgensen, Ellis & Ruddell, 2012; Maruthaveeran & Van Den Bosch, 2014) although any benefit may depend on whether these 'others' are viewed as legitimate users of the space (Day, 1999).

Paradoxically, parents desire to keep their children safe from harm can have unintended negative consequences for children's physical and psychological health (Carver, Timperio & Crawford, 2008). Parents and children's concerns about

traffic are well founded. Younger children appear to be more at risk of traffic injury than older children.

As children aged and become more mobile, well-connected streets are associated with greater mobility. In turn, this provides children the opportunity to acquire the basic skills to interact with and move through their neighborhood. Children were given the chance to solve problem, manage risks, make judgements in different traffic situations (such as judge traffic speed, interpret traffic signs and cross roads), explore their surroundings and improve their spatial and way-finding abilities (such as distance estimation, locating north, identifying landmarks and spatial referencing skills) (Rissotto & Tonucci, 2002). These skills are vital for children's healthy cognitive development and are required to build confidence and competence to safely interact with their environments (Rissotto & Tonucci, 2002). However, well-connected streets are often characterized by high traffic exposure as cars and pedestrians may use the same routes.

METHODOLOGY

This research has resorted to use the guiding method concept by taking into consideration the theories, indicators, concepts, models and any research findings from previous research to guide in the undertaking of the whole research process. Apart from that, the research data were obtained through a qualitative method, in exploring children's view in order to identify the barriers of children's outdoor play in urban neighbourhood. The empirical data for research design gathered via focus group interviews from the Child Friendly Neigbourhood Environment (CFNE) Workshop in Sekolah Kebangsaan Seksyen 7, Shah Alam. 28 children age 10 and 11 were selected as the respondents of this research.

This research addresses the interdisciplinary nature of research involving children and how the methods of research can meet children's 'human sense'. According to Robinson (1986), most of children aged11 years old and older are fully able to articulate their perceptions, opinions, beliefs; and with a relatively little adaptation, thus, a survey designed for adults can be used with adolescents. The participants involved were those children living in Zone 3, Shah Alam and has no speech difficulties. Based on the academic performance, these participants were among the average to excellent achievers.

Donaldson (1978) emphasized that the design of the task for children should be possible to reveal their true competencies. The tasks must meet 'human sense' to children. In the workshop, the author and the facilitators have demonstrated that a carefully crafted investigation can offer important insights about children's capacities. Thus, each activity has been planned and designed to be suitable to the participants.

Drawing was used in the workshop as it is regarded as a universal language and it offers children a valuable release for emotion, which may not be verbalized, and it serves as a means of communication. When drawing is used as

a tool for communication, children are able to express themselves and make meaning out of the world around them. Using drawing as a means of communication helps the process of making ideas, thoughts, and feelings available to others (Adams, 2006).

RESULTS AND DISCUSSIONS

A remarkable decline in the level of children's freedom to explore their own neighbourhood independently has occurred over the last few decades in Malaysia. Analysis of this research identified the importance of children's freedom of movement with the combination of diverse environmental affordances to facilitate play which is fundamentally important in a child friendly environment. These findings are congruent with the findings from a research by Hart (1979) in supporting freedom of children movement. He stated that the independent mobility is not only important for the children, but it also gives value for their parents and other adults who are responsible for them, for the wider environment and for the strength and vitality of local neighbourhood communities. As stated by Freeman and Tranter (2011), the level of children's independent mobility is an indicator of the success and resilience of a city.

Extra traffic adds to parental concern on safety and reduces the number of children allowed to walk around the local streets. Most of the participants of participatory workshop noticed, since most people have chosen to drive rather than to walk or cycle, the streets have become lonely, deserted and are seen as dangerous, as there was no one around to provide passive surveillance for them. As expressed by BA5, everyday, he goes to school with his father and came home with his mother. Even though the distance of his house was less than one kilometre from school, his parents were not confident to let him walk or ride independently.

To understand how children felt about their neighbourhood, the workshop facilitator has asked what they liked and disliked about their neighbourhood, their most favourite and least favourite places, as well as the places they identified as child-specific areas in the neighbourhood. They were asked to identify any safety issues that exist in their neighbourhood environment.

Figure 1 shows the neighbourhood's map as drawn by GA7. The neighbourhood lookscomplete with a playground, futsal's court, surau and security guard post. However, when researcher asked about how she felt about her neighbourhood, the girl looked unhappy. She said:

Even though there is a playground near my house, I seldom go there…because I don't have friends here. Usually, it is only the smaller kids who went to the playground, as small as seven years and below. I love to play in natural space. (Translated by the author)

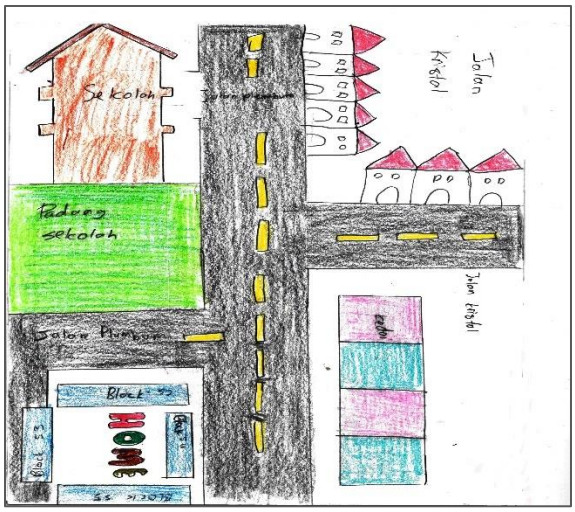

Figure 1: The neighbourhood map as drawn by GA7

The neighbourhood map done by GA4 (Figure 2) shows that a playground was provided in her neighbourhood. She also drew a gate to access the playground, as well as some playing equipment. Based on the map, the researcher asked her about the condition of the playground. In response to that, GA4 explained:

There is a playground near my housing area. However, it is always empty and seems deserted. The location which is at the end of the neighbourhood makes it even more hostile. There seems to be no attraction for children to go to the playground. Much playground equipment is broken and the grasses are left to grow. There was once an incident where a child has seen a snake in that area. (Translated by the author)

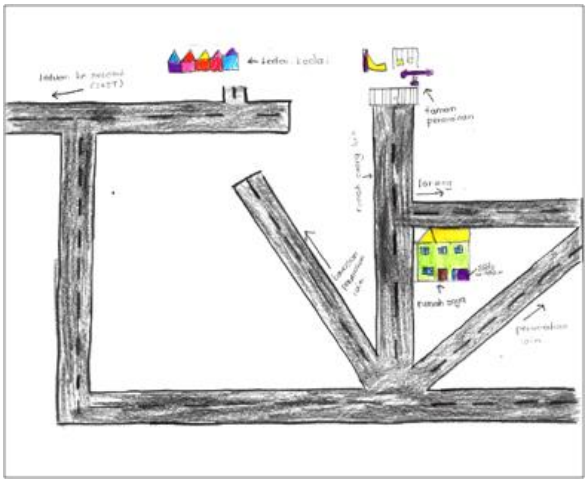

Figure 2: The neighbourhood map as drawn by GA4

In Zone 3, the increasing number of residential, industrial and commercial areas can lead to the loss of open spaces and children are likely to be acutely affected by this. As illustrated in Figure 3, GA5 was staying in an apartment and the apartment was surrounded by a school, a mosque and commercial buildings. She felt that there are no space for nurturing environment within the vicinity of her flat. If she wants to go to the green space, she needs to walk with her parents because crossing the road on her own would be dangerous. She would prefer it very much if the play space or green space is located just below her apartment or that every floor of the flat is provided with one green space for the children.

Figure 3: The neighbourhood map as drawn by GA5

The neighbourhood becomes the story about what they do and play. The neighbourhood has been going through changes by means of the children's narratives. Since the activities, experiences and narratives within the neighbourhood are in some ways rather different from those of the adults, children's perceptions and narratives about the neighbourhood will not be identical to those of the adults.

From the children's comments, it is evident that it is difficult to attain excitement and be imaginative in their neighbourhood because they were often challenged and provoked by the sense of order, neatness, control and safety by the adults. This is also due to the fact that the potential for excitement and imagination at accessible playgrounds differs at a great deal from one neighbourhood to the next. As opposed to GA4, even though she adores badminton, she does not get the opportunity to play frequently. The space to play was limited and was normally occupied by adults.

Figure 4: Drawn by GA4

In this research, the two main characteristics that promote a safe and nurturing environment for children to roam around with freedom are positive parents and community support.

Positive Parents

Parents' perception of safety has a close relationship with their fear of crime towards their children. Sutton (2008) indicated that societal fears have also impacted children's use of outdoors – with concern over crime and children's safety in public space linked with a decreasing amount of time spent by children in the outdoors. The issue of stranger danger seems to be a concern here even though the evidence illustrated that there are little likelihood for stranger danger encounters. This may just be a residue of a cultural fear of strangers pervading Malaysian media.

When discussed about these strangers, BA8 mentioned that**:**

> *I'm staying in the flats… The playground and the field are just nearby…But. I feel much safer playing indoors because I think my neighbourhood is not so safe. I heard about burglary cases in my neighbourhood. I'm scared of these bad people. (Translated by the author)*

It is important for parents to assure children can have their own views on things and they can also express their views freely. The child will develop at an early age the sense that the environment is, in part, created by people including themselves. When parents are very concerned about their children's safety, it will affect the children's independent mobility and limit the allowable boundary for

children to play in places away from home. Parents are concerned about the safety of their children (Veitch, 2005) which are mainly related to the danger of traffic, strangers and other nuisance (Veitch, 2005; Castonguay & Jutras, 2010). In addition, when car becomes the most popular means for the children to go to school, the opportunity for them to visit local parks, engage in natural play in the surrounding neighbourhood area and ride their bikes or scooters in the streets in their free time are made limited. In fact, it appears that driving children to school is more about convenience rather than for safety purposes.

Community Support

The sense of community living is very important for the assurance that parents could trust others to observe their children and this 'others' are their neighbours. If the parents themselves do not have this sense of community support, the number of children using the outdoor spaces would decrease. Parents with a great sense of community will be more open to let their child use the shared outdoor spaces as compared to parents with a relatively lesser sense of community. As stated by Shamsuddin, Zaini andSulaiman (2014), parents who have a close relationship with their neighbours (whose children were their children's peers) do feel more confident to allow the children use the outdoor spaces without the parents' close supervision. The accessibility of children to their play space is also important to create a child friendly neighbourhood environment. Kytta (2004) stated that accessibility is the opportunity for children to be able to access their physical affordances.

The other issue is the case of missing children that make parents become suspicious of their children's surrounding. Therefore, it is the responsibility of every community member to be vigilant and informed about what is happening within the neighbourhood, so that should there be anything out of the ordinary, then the necessary actions such as alerting the police or other neighbours can be taken. Passive surveillance is also reduced by low sense and connection with the community. Thus, a strong sense of community among the residents could increase the sense of belonging amongst the community and to the place itself. Since most of the parents here may be living far from their relatives, therefore, the strong sense of community amongst the residents is very important. Having a loving family, caring and friendly neighbours are the greatest support in a child friendly neighbourhood environment. In overall, the finding shows that the significant features which can promote a safe and nurturing environment for children to roam around freely are positive parents and community support.

CONCLUSION

Everyone experiences fear at some points in their lives. Children, however, are particularly likely to have fears. Adults might see children's fears as silly but they are very real to the children. In this research, positive parents and community

support are the main characteristics to promote a safe and nurturing living environment for children. It is clear that the children who attended the participatory workshop implied that lack of space and the accessibility for ordinary surveillance should be measured. They wanted the play space as their meeting point for all children in the living area. Apart from that, children wanted also a place where they could create their own play opportunities while being safe.

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MEASURING PUBLIC ASSET PERFORMANCE USING OUTPUT-BASED APPROACH: EVIDENCE FROM INDONESIA

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Abstract

Islamic garden is a traditional garden concept that is significantly related to the history of the Muslim civilization. The first establishment of the concept was in the 7th century through the formation of the Persian Garden. Presently, the idea of the Islamic garden is beginning to be overlooked as the contemporary garden design is becoming a current trend. The situation has given a negative impact towards the implementation of the traditional garden concept. This study is conducted to identify the physical characteristics of the Islamic garden. The first objective is to determine the chronology of the Islamic garden design and, second, to categorize the physical characteristics of the garden according to the level of its importance. Three types of methods are embedded in the study, which are the document analysis, site study, and semi-structured interviews. The method of analysing the data is using the Atlas.ti and Microsoft Excel software. The result gathered are categorized into two important aspects: (1) the movement of the Islamic garden concept in response to the history of the Muslim civilization and (2) the list of the physical characteristic of the Islamic garden. The result is triangulated as to develop an understanding on the list of the significant physical characteristics of the Islamic garden that

Keywords: garden, Islamic garden, physical characteristics, Malaysia

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INTRODUCTION

Good governance puts its emphasis on the improvement of the public sector management system to increase efficiency, effectiveness, productivity, and competitiveness in service provision (Gumede & Dipholo, 2014). To conduct good governance, the Government of the Republic of Indonesia has reformed its National Finance, with the aim of restructuring the management of its national finance. This reform started by the issuance of 3 laws, those are: Law 17/2003 on National Finance, Law 1/2004 on National Treasury, and Law 15/2004 on National Audit. Through financial reforms, the government has committed to improve the quality of financial information of the country, in terms of assets, debt, and investment.

To manage public assets in national level, or what is known as State-Owned Asset (SOA), the Indonesian government has regulated the implementation of SOA management at the Central Government level. Article 42 verse (2) of Law 1/2004 on National Treasury stipulates that procurement of SOA is fundamentally meant to be utilized in the conduction of government duties and functions. If there are SOAs not being utilized for the conduction of government duties and functions, Governmental Regulation 27/2014 states that it is mandatory for the Line Ministries serving as the Asset User to hand over the SOA to the Minister of Finance as the Asset Manager, of which in this case is the responsibility of the Directorate General of State Assets Management (DGSAM).

In the past several years, the Government of Indonesia has been actively undertaking changes in national fiscal management, that is by transferring some of the consumptive spendings into something more productive (LKPP, 2016). Such structural reform of national expenditure is part of the Government's efforts in maximizing the role of national expenditures in boosting economic growth, reducing poverty, and creating employment. The government has established a policy to prioritize national expenditure in the sectors of infrastructure, education, health, and social assistance (LKPP, 2016). This policy has been implemented by retrenching expenditures for subsidies and allocating it for more productive spending. On the other hand, efficiencies in the budget allocation of line ministries (K/L) have also been carried out through, among others, the retrenchment of non-priority and non-productive K/L expenditures such as non-infrastructural capital expenditure like office buildings and vehicles (LKPP, 2016). For purposes of retrenchment and improving the quality of non-infrastructural capital expenditure planning, the Government has begun implementing State-Owned Assets Needs Plan (RKBMN/Asset Planning) in several K/L as pilot projects (LBMN, 2016). Under such policy, SOA procurement plan is drawn up based on assets standard, needs standard, and strategic plan of K/L with an emphasis on optimization of existing SOAs (LBMN, 2016).

There are, however, some problems confronted by the Government in maximizing the use of existing SOAs. Firstly, the existence of idle SOAs, which are SOAs that are currently not and are not going to be utilized in the conduction of government duties and functions. The 2015 annual report concerning Idle Public Property issued by the Ministry of Finance (MOF) shows that MOF as SOA Manager was in possession of idle assets worth more than IDR 26 billion – some have been unused for years (LBMN, 2016). This figure does not include idle assets maintained by line ministries, which had either been reported without completing the handover process to the MOF, or those that had not been reported by any means as line ministries failed to recognize them as idle assets. Although idle assets pose a significant problem, their whereabouts can be identified and mapped out by the line ministries.

According to PMK No. 71/PMK.06/2016 on the Management of Idle SOAs for Conduction of Line Ministries Duties and Functions, the idle asset is defined as SOAs in the form of land and/or buildings that are not utilized for the interest of conducting line ministries duties and functions. Based on this definition, the existence of idle assets tends to be easily identified. Hence K/L as Asset Users will be able to map out these assets and implement proper strategies to address them. Attention needs to be given to the existing assets that are not performing optimally. Some instances are empty unused floor areas, abandoned rooms that have been made into temporary storages then eventually forgotten and become permanently idle. These spaces are supposed to be maximized for fulfilling the needs of K/L, yet the crux of the matter lies in how we can measure or assess the optimal utilization of a certain asset. Or in other words, how can we best measure the performance of an asset? As of current, the Government has yet to acquire a tool for measuring asset performance (DJKN, 2017). In response to this issue, this paper proposes a simple and convenient equation on how to measure SOA performance that may be used as a reference for the government in devising its policies.

RESEARCH METHODOLOGY

This is qualitative research that employed descriptive analysis through literature study then implementing it in a formula developed by the authors. The qualitative method was applied to desktop study and interview. The desktop study was held by reviewing the existing literature and related journals. This research was also carried out by conducting interviews and extracting data from the DGSAM, the Ministry of Finance, as the organization tasked with management of public assets in Indonesia. In addition, the authors had also interviewed officials at the Coordinating Ministry for Maritime Affairs (CMMA) as it served as the locus of study in this research.

LITERATURE REVIEW

In the concept of public finance management, asset performance is a part of asset management strategy intended to be aligned with spending/expenditure strategy to accomplish organizational objectives (Brown & Humphrey, 2005). This synergy indicator is apparent with the implementation of Law 1/2004. It shows the strategic role of public assets management as one of the significant indicators in controlling national budget and as an effort of realizing accountability in national financial management (Hadiyanto, 2009).

Provision of public assets is a part of the government's efforts in providing public services. The concept of improving service provision is known as New Public Management (NPM), which refers to bureaucratic reforms of administration and finance in the public sector. The NPM concept assumes that management practices in the private sector are far more superior than public sector management. Several management practices in the private sector that are considered superior, among others, are performance assessment, performance-based promotion and compensation system, cost management, flexible structure, and more advanced budgeting and accountancy system. While the traditional public-sector management system merely draws attention to policy, the NPM management system puts more emphasis on performance.

Public sector management is, thus, expected to improve and become more professional by implementing NPM practices. Concerning the implementation of NPM, change in public assets management and its relevant policies is one of the biggest challenges that must be confronted (Grubisic, Nusinovic, & Gorana, 2008). Study results from Ball et al. (Ball, 1999) show the significant impact that reform in public sector financial management has on fiscal consumption. Their study concludes that an impetus is necessary to maintain control over the efficient use of resources and public expenditure as well as to proactively strengthen the level of accountability pertaining to public resources management, of which public asset is a part of. Tanzi and Prakash (Tanzi & Prakash, 2000) argued that the habit of correlating efficiency with public spending, as is commonly done, may produce erroneous results if government institutions were to utilize public assets without calculating their cost of utilization.

One of the biggest challenges confronted in the implementation of the NPM concept is a change in public asset management and its relevant policies (Grubisic, Nusinovic, & Gorana, 2008). The implementation of NPM in public asset management is translated in some countries via the Strategic Asset Management (SAM) approach, which is an integrated public asset management concept used during the entire lifetime of the asset. The SAM approach includes management of asset for the entire duration of its lifecycle, starting from the planning process up to its disposal. The success of SAM is often linked to the

success of budget retrenchment as an impact of successfully integrating the process of planning and asset management (Hadiyanto, 2009).

The study conducted by Gibson (Gibson, 1994) found that while there had been significant progress made in capturing the quantity and quality of information pertaining to public assets, there was nonetheless a problem in making effective management use of such information. Management could not make effective use of information because there was no performance benchmarking system with appropriate performance indicators. Performance benchmarking of fixed public asset helps to establish if property resources are being managed in an efficient and effective manner (Ngwira & Manase, 2016). Ngwira et al. (2016) also found that performance measurement is a part of monitoring and oversight of public fixed asset management. It is derived to determine whether the management processes are appropriate, whether the intended asset performance and service delivery outcomes are achieved, and whether all the parties are accountable for fulfilling their responsibilities and roles (Columbia, 2002).

Based on service plans of a government agency, asset managers set their departmental standards of fixed asset services. Supervisors, in turn, stipulate their sectional standards as well as individual job standards (Hitt, Middlemist, & Mathis, 1989). Performance standards established by managers of different levels must be results-oriented, comparative, diverse and balanced, stable, realistic, and able to withstand scrutiny (Ngwira et al., 2016). Fixed asset management performance is monitored and measured against all established standards and specific indicators. Generally, appropriate feedback is also simultaneously provided regarding variances between actual results and expected standards, underlying causes, and corrections and improvements to be made (Columbia, 2002).

Output Based Approach in Measuring Asset Performance

Asset management is a systematic and structured process that includes the entire lifetime of an asset. The assumption underlying the implementation of asset management is that an asset exists to support the conduction of government duties and functions (Law 1/2004 on national Treasury, article 42 (2)). From a strategic perspective, institutions should develop and implement a strategy of asset management that defines the asset portfolio required by the institution to support it in providing services. The line ministries need to identify the risks relating to assets that influence the provision of services and the level of asset performance necessary to achieve the desired service performance determined by the management. This strategy should consider whether the assets have been optimally utilized to support the entire business objective or will the role be increased by conducting asset development, by collaborating with a third party or handing them over.

Optimization of existing SOAs can only be accomplished when apparatuses for measuring asset performance have been made. An effort that can be carried out to find out the asset performance employed by the line ministries is by measuring the performance value of an asset. One study done by Almeida and Felix in 2006 concluded that the output-based approach, which compares the actual and potential output levels of public assets, should be applied in order to assess public asset performance (Almeida & Félix, 2006). This approach was developed from Okun (1962) who had introduced a method of measuring output gap. It is a method developed from the Gap Theory, which had been introduced by Wicksell and Keynes (Hauptmeier, 2009), and is known as the Keynesian Concept of Inflationary Gap. In the concept of management, this approach is known as 'utilization.' The concept of utilization is calculating opportunity gap, i.e., measuring the difference between what an asset can produce and what it produces. The actual output ratio could be attained if the percentage of asset utilization approaches 100% (Ellis, 1998).

The development of this utilization concept produced asset utilization indicators, to determine conditions of being fully utilized, underutilized, or unutilized/idle. The three forms of utilization are calculated based on the percentage of asset utilization. By having such performance measurement tool, the performance of each SOA is expected to be properly captured, and quality of public services, in terms of public asset, can subsequently be monitored and be provoked to continue to improve. Mathematically, Asset Utilization can be formulated as follows (Ellis, 1998):

$$AU = \frac{\text{Actual Output (AO)}}{\text{Potential Output (PO)}} \times 100\%$$

Actual Output (AO) is the value of asset unit/size/volume that is utilized in the conduction of line ministries duties and functions including for providing public services. Potential Output (PO) is the value of asset unit/size/volume that can be utilized in the conduction of line ministries duties and functions including for providing public services. The percentage of Asset Utilization (AU) indicates the value of asset unit/size/volume that has successfully been accomplished in terms of asset utilization. Subsequently, the following equation is used to calculate the value of opportunity gap an asset may have (Ellis, 1998):

$$OG = \text{Potential Output (PO)} - \text{Actual Output (AO)}$$

The above asset utilization equation was further developed then implemented on SOAs in the form of state-owned office buildings. This consideration is because such asset had substantial value in terms of its portion in

the balance sheet of Indonesia's Financial Report. In the 2016 report, it is clear that the total value of office building assets owned by the government retained a 40% portion of the total value of assets, which was ± IDR 2,200 trillion of the total IDR 5,456.88 trillion total recorded on the balance sheet (2016 Fiscal Year SOA Report). From the figure above, SOA value in the form of buildings is quite significant, with a 9% percentage of the total value of SOAs.

Another point to consider is that office building currently has a standard as a basis for building utilization potential plan which was instructed by the Minister of Finance through the Minister of Finance Regulation (PMK) No. 7/PMK.06/2016 on the amendment of PMK No. 248/PMK.06/2011 on Assets Standard and Needs Standard of State-Owned Assets in the form of Land and/or Building. This standard is subsequently used as the optimal output of office building utilization. Currently, office buildings are used for supporting in the implementation of line ministries duties and functions to provide public services. However, there is the possibility of utilizing office building spaces for other uses such as ATM centers, non government offices, and meeting rooms.

FINDINGS – PROPOSED CONCEPTUAL FRAMEWORK

In this study, the equation for measuring SOA performance was developed in line with the concept of opportunity gap, and it was implemented on office building SOAs. In accordance with laws and regulations on SOA management, the procurement of an SOA is essentially intended for conducting government duties and functions. If an SOA were not utilized for the conduction of government duties and functions, PP No. 27/2014 stipulates that the SOA should be handed over by the line ministries as the Asset User, to the Minister of Finance as the Asset Manager. PP No. 27/2014 also states that if an SOA were not utilized for the conduction of government duties and functions, then utilization of said SOA can be carried out by engaging in third-party collaboration, via mechanisms of leasing, rent, build-operate-transfer/build-transfer-operate, or utilization cooperation.

Based on the provisions stated in the above regulation, this paper proposes a formula to measure SOA performance as the total obtained by adding up asset performance (KA) for conducting duties and functions (KA_{TUSI}) and asset performance for utilization (KA_{MAN}). The equation developed was made by accommodating provisions on SBSK (Assets Standard and Needs Standard) written in PMK No. 7/PMK.06/2016. Description relating to the calculation of Office Building SOA Performance for the Conduction of Duties and Functions (KA_{TUSI}) and for Utilization ($KA_{MANFAAT}$) is elaborated further in the following section:

$$\% KA_{TOTAL} = \% KA_{TUSI} + \% KA_{MAN}$$

Calculating Office Building SOA Performance for Duties (KA_{TUSI})
By accommodating the stipulations on SBSK written in PMK No. 7/PMK.06/2016, the performance of SOA was formulated to be the total number of employees (potential) multiplied by the need for building space per employee based on their title and function then added by the dimension of supporting facilities, and dimension of dead space (if any). The equation is thus formulated as follows:

$$\mathbf{L_{SBSK}} = \sum (\text{amount of employees}_{(\text{potential})} \text{ x dimension of building space per function}) + \sum \text{dimension of facilities} + \sum \text{dimension of dead space (if any)}$$

Apparently, calculating office building SOA performance can be done by comparing the value of actual assets currently utilized to the value of assets suggested and contained in the Asset Standard and Needs Standard (SBSK). Different from the L_{SBSK} calculation above, which is based on the number of potential employees, the actual value (L_{ACT}) calculation is based on the number of an actual number of employees at a given point in time. The equation is formulated as follows:

$$\mathbf{L_{ACT}} = \sum (\text{amount of employees}_{(\text{actual})} \text{ x dimension of building space per function}) + \sum \text{dimension of facilities} + \sum \text{dimension of dead space (if any)}$$

Hence, the percentage of office building SOA Performance utilized for the conduction of duties and functions (KA_{TUSI}) can be presented as follows:

$$\mathbf{\%\ KA_{TUSI}} = L_{ACT} / L_{SBSK} \text{ x}100\%$$

Calculating Office Building SOA Performance for Utilization ($KA_{MANFAAT}$)
The value of asset utilized is the real value produced through the collaboration between the line ministries and their Partners. Collaboration conducted with a partner to set up a Café for guests, is an example. In this case, the calculated values are real values of the booth, sitting area for costumers, storage space, and pantry. Based on such consideration, the authors formulated an equation relating to the value of utilized asset performance as follows:

$$\mathbf{\%\ KA_{MAN}} = L_{MAN} / L_{SBSK} \text{ x } 100\%$$

Calculating Office Building SOA Performance for Duties (KA_{TUSI})
Based on the equations above, the total performance value of office building SOA is likely to be acquired by employing the following formulation:

$$\textbf{\% KA}_{\textbf{TOTAL}} = \% \, KA_{TUSI} + \% \, KA_{MAN}$$

$$\textbf{\% KA}_{\textbf{TOTAL}} = (L_{ACT} + L_{MAN}) / \, L_{SBSK} \times 100\%$$

MEASURING ASSET PERFORMANCE: A CASE STUDY

To test the possibility of applying the equations formulated above, a case study measuring the performance of a building in one of the line ministries, namely the Coordinating Ministry for Maritime Affairs (CMMA), has been conducted. The data used in this study is based on the 2016 Fiscal Year State-Owned Asset Needs Plan data.

CMMA occupies a 21-story building in the Central Jakarta area to conduct its duties and functions. The building is shared with a few other line ministries, namely the Indonesian National Standardization Agency (BSN) and the Indonesian Agency for the Assessment and Application of Technology (BPPT). Several data, shown in the tables below, had been collected to calculate SOA performance of the CMMA. Table 1 shows building specifications. Table 2 contains data on building dimension and utilization. CMMA utilizes 14 of the total 21 available floors, wherein each floor has an area of 864 m^2. Most of the area on the 17th floor is occupied by the BPPT, leaving a total area of 11,664.00 m^2 (12,096 m^2 – 432 m^2) to be utilized by CMMA. Table 3 contains data relating to the number of both existing and potential employees.

The needs standard of SOA in the form of office building refers to the provision regulating Assets Standard and Needs Standard (SBSK) of SOA, which had been established in PMK No. 7/PMK.06/2016 on Assets Standard and Needs Standard of State-Owned Assets in the form of Land and/or Building. Table 4 contains SOA SBSK data concerning workspace and supporting space. Both SOA SBSK in the table is aligned with PMK No. 7/PMK.06/2016.

Table 1: Building Specifications

Name of Ministry/Institution	:	Coordinating Ministry for Maritime Affairs (CMMA)
Total Building Floors	:	21 Floors
Total Building Area	:	Mezzanine : 723 m^2 Floors 1 - 21 : 18,144 m^2 Total Area : 18,867 m^2
Total Floors Effectively Utilized by CMMA	:	14 Floors
Total Area of Floors Effectively Utilized by CMMA	:	11,664 m^2

Source: CMMA, 2016

Table 2: Employee Data

DESCRIPTION	NUMBER OF EXISTING EMPLOYEE	NUMBER OF POTENTIAL EMPLOYEES
MINISTER	1	1
ECHELON I A	5	5
ECHELON I B	0	4
ECHELON II A	23	24
ECHELON III	54	68
ECHELON IV	33	38
IMPLEMENTERS	100	100
TOTAL	**216**	**240**

Source: CMMA, 2016

Based on the above data, the necessary area according to SBSK (L_{SBSK}) had been calculated, and the acquired results are shown in Table 3.

Table 3: Calculation of Expected Dimensional Needs for Office Building

	Description	Based on Potential Employee Data			Based on Existing Employee Data		
		Officer	Area (SBSK)	Total Area (m^2)	Officer	Area (SBSK)	Total Area (m^2)
Work Space							
1	Minister Room	1	223	223	1	223	223
2	Echelon I A	5	102	510	5	102	510
3	Echelon I B	4	79	316	0	79	0
4	Echelon II A	24	70	1,680	23	70	1,610
5	Echelon III non-Office Head	68	21	1,428	54	21	1,134
6	Echelon IV non-Office Head	38	11	418	33	11	363
7	Echelon V / Implementer	100	5	500	100	5	500
	Area of SBSK Work Space	**240**		**5,075**	**216**		**4,340**
8	Total Number of Employee	240					
9	Total Number of Staff	100					
Supporting Space							
10	Main Assembly Room of Ministry	1	140.00	140.00	1	140	140
11	Main Assembly Room for Echelon I	9	90.00	810.00	5	90	450
12	Main Assembly Room for Echelon II	24	40.00	960.00	23	40	920
13	Assembly Room/Aula of Line Ministries	1	400.00	400.00	1	400	400
14	Assembly Room/Aula of Echelon I unit Managers	9	150.00	1,350.00	5	150	750
15	Archive Space (0.4 m^2 x Number of Employee)			96.00			86.40
16	Functional Space (0.8 m^2 x Number of Employees)			192.00			172.80

	Description	Based on Potential Employee Data			Based on Existing Employee Data		
		Officer	Area (SBSK)	Total Area (m^2)	Officer	Area (SBSK)	Total Area (m^2)
17	Toilet (5 m^2 for every 25 employees)			41.20			37.40
18	Server (0.02 m^2 x Number of Employees)			4.80			4.32
19	Lobby/other facilities (20 m^2 per 1000 m^2 of gross area excluding the lobby)		9,069.00	181.38		7300.92	146.01
	Area of SBSK Supporting Space			**4,175.38**			**3,106.93**
	Floor Area of Building			**9,250.38**			**7,446.93**
	Floor Area:						
	Non-Simple Multiple Level Building (dead Space 30% of Building area) *		70.00%	70.00%			70.00%
	Gross Floor Area of Building			**13,214.83**			**10,638.47**

*) PMK No. 7/PMK.06/2016

Using the equation of: % KA_{TUSI} = L_{ACT} / L_{SBSK} x 100%, then % KA_{TUSI} can be calculated as follows:

% KA_{TUSI} = L_{ACT} / L_{SBSK} x 100%
= (10,638.47 : 13,214.83) x 100% = 80%

The source person from CMMA stated that a part of the office building areas is planned to be utilized for the ministry's partners, that is a total area of ¾ of the floor measuring 648 m^2. Hence, KA_{MAN} can be calculated as follows:

% KA_{MAN} = L_{MAN} / L_{SBSK} x 100%
= (648 : 13,214.83) x 100% = 4%

Based on the above calculations, the performance of SOA in the form of an office building at CMMA will be:

% KA_{TOTAL} = % KA_{TUSI} + % KA_{MAN}
= 80% + 4% = 84%

By applying the above formula, it is known that 84% of the office building has been utilized by CMMA for running its duties and functions, while 16% of office floor area or a total floor area of 1,866.24 m^2 has not been optimally used. The office building SOA performance can, accordingly, be categorized as underutilized. Considering this findings, CMMA as Asset User is suggested to take some actions for the 16% of unutilized space, including construct some alternatives of asset utilization scheme and propose the utilization to DGSAM, Ministry of Finance as Asset Manager. Once CMMA solves the 16% of unutilized space, it will give impacts on National Budget as budget efficiency through maximising the use of existing asset rather than buying the new one or through

generating non-tax revenue by leasing the space to third party that meets the regulations requirement.

CONCLUSION

The development of public asset performance measurement is vital for the government to be able to measure how best a certain public asset has delivered its service to the public. Nevertheless, the absence of tools for measuring those performances becomes an important issue. This study proposes a simple and convenient equation on how to measure SOA performance by adopting the Output-Based approach. This study shows that by referring to the case of the CMMA, it is feasible to use the proposed formula to measure SOAs performance, especially for an office building. From applying the formula into the case study and analyze it, it can be concluded that 84% of the CMMA office space has been fully utilized, while 16% of the space is not performing optimally. This study suggests that the CMMA may construct some alternatives of asset utilization scheme and propose them to the Asset Manager. For further research, this paper suggests that other types of public assets such as land, toll roads and dams be measured. This paper also suggests conducting further analysis on how to measure public asset performances using outcome basis for future studies.

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ACTIVE AGEING AND HOUSING ENVIRONMENT CONCEPT AMONG ELDERLY MUSLIMS

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Abstract

Malaysia is expected to face ageing population in year 2030. This phenomenon is a challenge that hinders the provision of an excellent environment, including housing them. Active ageing refers to the process of improving the quality of life amongst the elderly in terms of health, social, physical, and environmental aspects. Provision of environment that is conducive and promotion of active surrounding highly influence the elderly to stay active. Nonetheless, literature pertaining to this particular topic area from the stance of elderly Muslims is in scarcity. Hence, the objective of this study is to determine terms associated to active ageing from the Muslim perspective and to identify the appropriate housing environment for them. Data collected from questionnaires distributed to 411 respondents residing in Johor were analysed quantitatively. The outcomes suggest that active ageing amongst elderly Muslims displayed positive effects on spiritual and religious activities. Upon providing housing for them, active ageing is essential so as to perceive active living and exceptional well-being.

***Keywords*:** active ageing, muslim elderly, housing elderly, spirituality, religiosity

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INTRODUCTION

Active ageing is a common term in a number of nations, such as Japan, United Kingdom (UK), and United States of America (US), which seem to better appreciate their seniors and the elderly contributions towards social, economy, and physical aspects for national development. As for the case in Malaysia, our elderly are not given much priority since they are always seen as incapable, weak, and helpless. Through provision of an environment that is conducive, the view towards active ageing among Malaysians is bound to receive a fresh perspective of living. Therefore, it is vital to classify those who experience active ageing since the environment and culture in Malaysia may differ from other countries, especially in terms of their spiritual aspect. The existing active ageing determinants do not exclusively specify the Muslim elderly. Thus, it is crucial to probe into this topic since the main focus of their activities may vary from other ethnicities in Malaysia. With that, this research introduces a new concept of housing for the elderly based on active ageing living perceived by various scholars, including the function of spiritual and religiosity domain in enhancing active living amongst Muslim elderly. Some aspects of the literature have detailed and tested these elements with least attention given to Muslim elderly (Tohit, Browning & Radermacher, 2012; Majid et al., 2013; Ahmad & Khan, 2016). Although Elsawahli, Ali, Ahmad and Al-obaid (2017) suggested the potential environment of active ageing, they failed to emphasise on Muslim. This study bridges the gap highlighted in a prior study by interpreting active ageing and housing features associated with spiritual and religious elements from the Muslim elderly perspective, apart from suggesting a housing environment that could potentially fit their needs and demands.

ACTIVE AGEING AND MUSLIM OVERVIEW

The World Health Organisation (WHO) defined 'active ageing' as the 'process of optimising opportunities for health, participation, and security in order to enhance the quality of life as people age' (WHO,2012). Accordingly, WHO categorized active ageing based on six determinants, which are health and social services, behavioural determinant, personal determinant, physical environment, social determinant, and economic determinant (Lai, Lein, Lau, & Lai, 2016). Active ageing is aimed at extending life expectancy and quality of life without giving burden to others. Meanwhile, the International Council on Active Aging (ICAA) illustrateed active ageing as synonymous to "engage in life". The engagement is towards wellness, emotional, environmental, physical, social, and spiritual, among others, regardless of age, socioeconomic status or health (ICAA, 2015). Successful ageing refers to multidimensional involvement that is inclusive of physical, functional, psychological, and social health (Phelan, Anderson, LaCroix, & Larson, 2004). In determining active ageing, the elderly should be physically active and indulge in biking, walking, and fitness trails, to name a few,

so as to gain strength, maintain flexibility, and increase endurance (An, S., Lee, Y. and Kim, 2013; Dahany et al., 2014; Sykes & Robinson, 2014). Paúl, Ribeiro, and Teixeira (2012) revealed that the economic determinants, physical environment, health, and social services are relevant to active ageing, which are also closely linked with personal needs, resources, and outcomes. Similarly, Boudiny (2013) supported this notion by encouraging participation amongst the in economic and social activities in order to remain active and independent. As for social terms, Bowling (2008) asserted that those ageing and are actively involved in leisure and social events are bound to increase their social relationships, apart from improving their active living.. Hence, being actively engaged in life events, such as participating in elderly club and community activities, enhances the health aspect amongst the ageing (Rattanapun, Fongkeaw, & Chontawan, 2009; Sutipan & Intarakamhang, 2017). Table 1 summarises the determinants and perceptions of active ageing outlined by varied scholars. Some essential criteria that interpret active ageing are social participation, health, physical ability without disability, as well as economy and financial stability.

Table 1: Summary Active Ageing Determinants from Different Scholars

Scholar's	***D1**	***D2**	***D3**	***D4**	***D5**	***D6**	***D7**	***D8**	***D9**
Rowe & Kahn, 1997				/				/	/
Phelan et al., 2004	/			/		/		/	/
Mayhew, 2005				/		/			
Bowling, 2008	/		/	/	/	/			/
Rattanapun et al., 2009	/			/					/
McLaughlin, 2010.	/			/					/
Paúl et al., 2012	/	/	/	/		/			/
An, Lee & Kim, 2013					/				/
Boudiny, 2013	/	/	/	/	/	/		/	
Sidorenko & Zaidi, 2013	/		/	/		/	/	/	/
Dahany et al., 2014						/			/
Lai et al., 2016	/			/	/	/			
ICAA, 2015	/			/			/		/
WHO, 2012	/	/	/	/					/

**Notes: D1= Health, D2= Behavioral & Personal, D3= Economic, D4= Social Participation, D5 Independence, D6= Physiology & Mental Wellbeing, D7= Spiritual, D8= Productive, D9= Physical Ability*

For a Muslim to be considered successful in ageing, the sole act of praying is insufficient. Muslims should also focus on their health from physical and emotional aspects. This is because; good physical health is an important resource that can facilitate one's commitment to their spiritual activities as spirituality is fundamental for healthy ageing (Tohit et al., 2012). There is

continuous debate pertaining to the relationship between religion and health, however, it has been widely accepted that the overall well-being of people is enhanced by religious beliefs and practices (Ahmad & Khan, 2015). Despite being ill, lonely or depressed, the elderly, generally, will find the meaning and support of life spiritually (MacKinlay, 2006). The integration between spirituality, religiosity, and participating in religious activities has an effect on social, health and psychological well-being. It is important to comprehend this notion in providing better living for Muslim elderly since their religion and spirituality have a strong interconnection, hence appreciating the true meaning of healthy ageing (Abolfathi Momtaz, Hamid, Ibrahim, Yahaya, & Abdullah, 2012). A study by various authors revealed that being religious can increased life satisfaction and hinder depression, when compared to those elderly who disregard such activities. Religious activities may influence one's mental health and psychological well-being towards healthy living as a whole (Levin, Markides & Ray, 1996). Basically, religion referred as a personal or institutional system of organised beliefs, practices, rituals, or ways of worship; while spirituality describes the feeling of connectedness with a higher power or consciousness and the search for answers to questions about the meaning of life, of illness and other sufferings, of death, and the very purpose of life itself (Ahmad & Khan, 2016). This also reflects the interconnection between spiritually, religion, and their faith in promoting healthy life in adherence to Quran and Sunnah. Moreover, active ageing in Islamic principles has highlighted the relationship of the older with their neighbours by participating in society, such as visiting the ill neighbour, admonishing or greeting them in a good way, looking for each other's needs, and offer help when required (Al-Shabani, 2005). Ultimately, this encourages active interaction between neighbours and those social networks make the elderly feel better, healthier and, consequently, better equipped to deal with life stress (White et al., 1999). Overall, not many variances have been drawn between active ageing among western scholar and Muslim elderly in determining the essential elements and characters, such as in terms of social participation, health condition, and physical needs. As for Muslims, their spiritual is guided by religious belief that influences their way of living.

HOUSE FOR MUSLIM AND ACTIVE AGEING LIVING

According to Maslow's Hierarchy of Needs, a house is refers to shelter, which is a basic physiological need for humans, along with food, clothing, and water (Maslow, 1970). For Muslims, this function is expanded to spiritual needs. As stipulated in Surah Al Nahl 16:80 "And Allah has made for you from your homes a place of rest and made for you from the hides of the animals tents which you find light on your day of travel and your day of encampment; and from their wool, fur and hair is furnishing and enjoyment for a time." Indeed the use of house is referred to as its role in connecting human relationship and the creator in search

of blessing in life (Musa, Talib, & Dani, 2011). In precise, a house is a place for people to perform worship with comfort, in peace, and achieve spiritual needs. Islam also emphasises on the importance of home in attaining spiritual peace, hence the serenity, the space in home, the ability to accommodate, and the ability to respond to the spiritual needs of human beings are some major factors of a comfortable home (Manesh & Azizi, 2016). From Islamic view, a house refers to a place of expression and strengthening family relationships. According to Omer (2010), the house is believed to be part of the source of family happiness and fortune, together as a principle social institution and family development hub. As people aged, their house preferences may become more adaptable to modifications that can assist their declination of functional capacity in order to maintain a sense of well-being and independence (Oswald et al., 2007). A serene home environment should accommodate to both housing and health, which are significant in ensuring healthy ageing since most elderly are vulnerable to environmental challenges (Iwarsson, 2005). Similarly, the decision of housing preferences among the elderly was dictated by health and financial statuses (Ogilvie, 2011). However, their level of housing needs differs. The size of a house is closely associated with the size of its household. Large houses are difficult to maintain, especially when only one occupant is left once their children move out. The other argument is that housing for elderly reflects a higher attachment with the surrounding neighbourhood, such as a quiet neighbourhood, sufficient shopping facilities, proximity to downtown, and scenic environment (Kramer & Pfaffenbach, 2016). However, in terms of ability to own a house, the elderly nowadays possess some degree of wealth since the present generation is better educated and has greater financial resources, when compared to previous ones (Chan & Davanzo, 1996; Aini, Aziz, & Hanif, 2015; Kramer & Pfaffenbach 2016). They have different expectations in acquiring a house as they have experienced more education opportunities, emancipation, and participation (Jong, Rouwendal, Hattum, Jong, & Hattum, 2012). This phenomenon seems to affect their lifestyles and lead them to have varying housing preferences upon retirement. Residency is related to the existing sociocultural background of a person as mentioned by Rubinstein, and Medeiros (2003). The environmental gerontologists have asserted that as people aged, they increasingly become devoted to the place they live, simultaneously become more sensitive and vulnerable to their social and physical environment (Iecovich, 2014). With long-term duration residing at the same home, their attachment to familiarity, process, and housing is reflective of new meanings for those elderly (Oswald et al., 2007). This leads to the decision of not moving, but staying in the same pleasant environment throughout their lifespan (Aini, Aziz, & Hanif 2015). Hence, it is important to have such a good environment attached to elderly in housing choice. In discussing housing preferences among the elderly, the factors of sociocultural,

daily routine, health, and environment must be weighed in as they are closely linked together in providing suitable housing for them.

Overall, this study recognised the factors that can influence active ageing living through their housing environment. This is because; the elderly spends most of their time at home. Nevertheless, our national policy does not address the housing needs of the elderly and denies the needs of active urban elderly in the housing programmes specifically for Muslims. Hence, this study suggests the possible environment to encourage active living among those elderly by introducing viable housing environment that can fulfil their spirituality and religiosity aspects. Unfortunately, not many housing developments cater to this group, although Malaysia is known as an Islamic country where the majority of its people are Malays and Muslims. In response to this issue, several principles in Islamic values can be applied as the basis for developing housing suitable for Muslim living. As the focus amongst the elderly on religion may increase; preferences of faith and religion in housing environment and neighbourhood need deliberation.

METHODOLOGY

In order to address the research objective, this research reviewed all the available literature from prior studies to identify the active ageing determinants and housing preferences amongst the ageing Muslims. The data collection had been mainly quantitative in nature obtained via questionnaire survey. This study used random sampling so that everyone was presented equal chance of being selected for this study. For the sampling, the researcher had to be precise in selecting the potential population. In this case, the researcher applied the Taro Yamane formula to use the size of the population in representing the respondents. The selected degree of confidence was 95% by assuming a 5% chance that the actual percentage was not within the selected confidence interval (Yamane, 1967). Smaller range gave greater precision in the end outcomes. Based on the total population in Johor with age 50 years old and above, it was determined that the total number of respondents for this study was at least 400. Hence, the detailed calculation of the sample size had been based on the following formula:

$$n = \frac{N}{1 + N\,(e)2}$$

** (n= sample size , N= population, e= degree of confidence)*

As for the location and sampling, this study focused on Johor as it has the second highest elderly population of in Malaysia. Respondents who were 50 years old had been selected for this study as they were bound to experience ageing and the preparation that they would need to think about to go through the next decade. As the WHO did not state the age number of active ageing, their determination was based on their ability to contribute to the nation's development,

thus this study did not limit on active ageing by pointing those in the young ageing group (60-70 years old), but instead incorporated a different ageing group of people. The sample examined the religiosity and ageing personality, as well as their connection to active ageing, specifically to housing and living environment. This research used the 4-point Likert scale (totally disagree, disagree, agree, and totally agree) to avoid respondents from giving neutral response. The choice to omit the neutral response may reduce bias and this study would be able to capture a clearer stance if the respondents agreed or disagreed with the statements. It also could speed up the process of answering the questionnaire as the scale had been limited to four options only. In fact, the survey in this study applied a relatively long questionnaire and the length may influence negative response rate; thus limiting the options may prevent inaccuracy of data collection (Cerin, Saelens, Sallis & Frank, 2006). The data were analysed using Statistical Package for Social Science (SPSS). For nominal data, they were analysed by using frequency table and category proportions by percentages, while the ordinal data were arranged in scale to evaluate the views of the respondents on active definitions, characteristics of housing, as well as spiritual and religious of housing elements, for Muslim living. The data were analysed using rank order median and standard deviation that assessed the level of agreement by the respondents.

RESULTS AND FINDING

a) Demographic profile of respondents

This section reports the results of the survey analysis. As presented in Table 2, the demographic information of the respondents is listed in terms of gender, age, marital status, employment, living arrangement after retirement, and house ownership. This profile demonstrates mostly equal participants in male and female respondents; the average age of the group was below 55 years old, mostly married, and employed. Although some of them appeared to be retirees from their previous job, they were still working subject to their capability of age and to fulfil their free time by operating small businesses, farming, being self-employed, and so on. In terms of living arrangement, Muslim elderly chose to stay with their children and partner, instead of staying alone. It shows that Muslim family bonding is still in strength, in fact, in Islam; the responsibility to taking care of elderly parents falls under their adult children.

Table 2: Demographic background

Demographic variable	n	%
Gender		
Male	202	49.1
Female	209	50.9
Age		
50-55 Years old	148	36
56-60 Years old	101	24.6
61-65 Years old	70	17
66-70 Years old	51	12.4
71 Years old and above	41	10
Marital status		
Married	331	80.5
Single	23	5.6
Widow	57	13.9
Employment		
Employ	203	49.4
Not employ/Retired	208	50.6
Living arrangement after retirement		
Alone	31	7.5
Couple without children	87	21.2
Couple with children	231	56.2
Children without couple	43	10.5
With other retiree	14	3.4
Others	5	1.2

b) Housing for Muslim elderly

Subsequently, this research investigated the housing criteria selected by the Muslim elderly in regard to active living. Table 3 demonstrates the different responses regarding housing impact on elderly people in physical and its surrounding, social environment, as well as spiritual and religious context. Most of them (91.5%) favoured small houses for better management and handling. The placement of houses should be close to the market for easy shopping. However, a handful of them (4.4%) strongly disagreed and disagreed towards the mentioned aspects. The other elements, such as sufficient facilities to all residents, prioritisation of safety and security, disability features, and housing location, were viewed as important elements to influence active and independent living among the elderly in their neighbourhood. The least mean score recorded for this physical attribute referred to provision of public transportation. As discussed in the literature review, since the younger generation of elderly is more educated, financially stable, and possesses high self-reliance, private vehicles were opted over public transport. As for housing from the social point of view, the respondents agreed that long attachment to the neighbourhood made them feel comfortable with the community, hence no intention to move. Their participation

in communities, neighbourhoods, and family is believed to assist them in experiencing active ageing. Meanwhile, housing from spiritual attributes indicated that maintaining privacy amongst the Muslims was strongly agreed with the highest mean score (mean=3.57) among others. Private space and time are significant in protecting the honour of elderly women especially, and make them feel comfortable to stay. Similarly, 208 respondents strongly agreed that the facilities and provision of space for religious activities are important for the comfort of their religious knowledge and education. Hence, the use of mosque or *surau* as the centre of community and perceiving more religious and charity activities are also significant amongst the elderly Muslims in maintaining Muslim belief and encouraging active living.

Table 3: The distribution on respondent's feedback on housing context

Housing Physical	SD	D	A	SA	MEAN
	%	%	%	%	
Small house is more manageable	0.2	8.3	54	37.5	3.29
Accessibilities to facilities	0.5	3.9	51.1	44.5	3.4
Adequate Facilities	0.2	4.6	54.5	40.6	3.36
Safe and security prioritisation	0.2	6.6	57.7	35.5	3.28
The provision of public transport	2.4	18.2	53.5	25.8	3.03
Disability feature	0	4.6	50.6	44.8	3.4
Housing location	1	18.5	49.9	30.7	3.1
Housing Social					
Community-based design	0	5.6	49.4	45.0	3.39
Social participation	1.7	1.0	48.9	48.4	3.44
Long attachment to the neighbourhood	.2	2.7	44.8	52.3	3.49
Community centres	1.2	1.2	59.6	38.0	3.34
Housing spiritual					
Space for religious activities	2.9	3.6	42.8	50.6	3.41
Mosque as a community centre	3.6	6.3	48.2	41.8	3.28
Designs based on Islamic beliefs	2.9	14.8	36.5	45.7	3.25
Private space for personal privacy	.7	9.2	21.9	68.1	3.57
The involvement of family	2.4	7.3	59.9	30.4	3.18
Religious activities & charities	1.7	10.0	48.9	39.4	3.26

**Notes: SD = strongly disagree, D= disagree, A= agree, SA= strongly agree, n= frequency number*

DISCUSSION AND IMPLICATION

This study had implicated the housing for elderly in the context of physical and social environment, as well as spiritual elements through the lens of elderly Muslims. The physical attributes, such as smaller housing, accessibility, transportation, adequate facilities, disability features design, and location of housing, may influence active living as higher percentages were retrieved to support this idea. As such disability features and accessibility to the facilities,

merchandise, and clinic were considered as the most important physical factor in defining the home environment for active elderly. As mentioned earlier, the perception of the elderly towards home is no longer for the purpose of wealth, but for protection and sustainability of the present. As people aged, their ability is constricted. Therefore, it is necessary to design a home that can support their inability someday, such as large bathroom space, handrails, and non-slip floors. Similarly, respondents also support the idea of housing aspect in social contexts, such as social participation, community-based design, and establishment of the community centre, to make them feel more 'liveable' and support their ageing life. The main purpose of this social environment is to strengthen their social interaction and to improve their social bonding in maintaining their well-being with the community. In Islam, housing and neighbourhood should be portrayed as a social centre and to foster their relationships. Generally, the physical and social domains mentioned above are helpful in defining suitable housing for elderly. Hence, with additional spiritual and religious elements, it may make the term 'housing' for the active ageing living among Muslims achievable. Among the elements, the privacy attribute plays an important role as it protects the dignity of elderly women, aside from assuring that they stay comfortably while maintaining their social relation to others. Islam also stressed out on this particular privacy matters in housing arrangements prior to development of housing. Privacy, which can be in the form location of openings, sleeping places and separation area, windows, and so on, should be considered in the planning and design process. If the residents feel comfortable living in the house, they are bound to feel happier and healthier, thus an active life. There was also a higher percentage for providing religious space for religious activities and religious education. In normal circumstances, this space is usually equated with the use of the prayer room in the mosque or surau in their residential area. Meanwhile, some respondents thought that the space should be isolated and a special place for them to worship more comfortably. For example, Muslims can learn al-Quran in private with other Muslims in special spaces. If more space for religious activities is provided, more religious activities can be implemented and this will help them in becoming more active. Studies also showed that Muslim elderly were more attracted to religious activities, instead of other activities, such as leisure, exercise, and walking. Yet, there is no obligation to create isolation of this space because some mosques are equipped with special spaces for religious activities without disturbing the existing prayer space. Overall, this study had proposed a conceptual framework of this housing environment for Muslims active living as in Figure 1. This figure indicates the elements of physical and social environment contexts of housing associated with spiritual and religiosity that can perceive Muslims experiencing active living in terms of their social, health, physical, economy and spiritual needs.

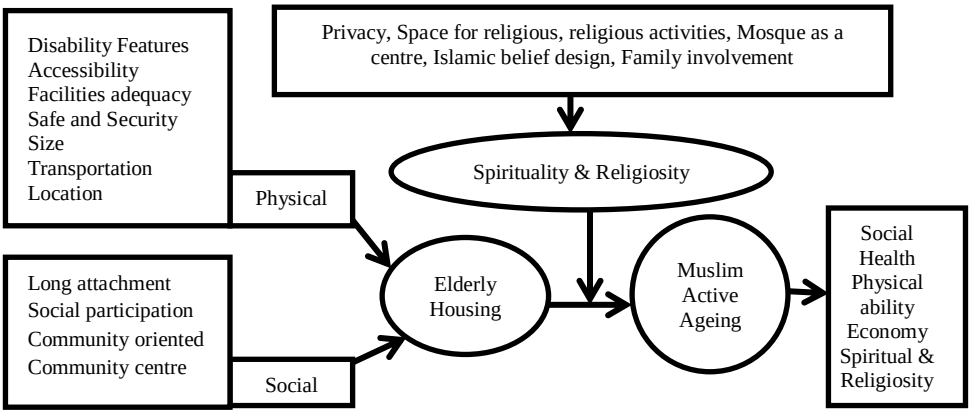

Figure 1: Conceptual framework of Housing environment for active ageing Muslims

CONCLUSION

Similar characteristics have been drawn in preserve housing determination from western scholars and from the stance of Muslim elderly. Most of the scholars only mentioned the physical environment and social factor when considering the housing design, while excluding the needs amidst Muslims. The fundamental idea of housing is to fulfil needs, and to offer a place that is safe and comfortable to occupy. Meanwhile, for Muslim elderly, housing appears to be not limited to fulfil the basic needs alone, but also emphasises on spiritual and religious activities, importance of strengthening relationship among family members and neighbours, modesty, and privacy. It was agreed that both housing and the environment can influence active living amongst the elderly. Nevertheless, the existing housing environment in Malaysia caters to the multiracial residents although Muslims make up the majority of the Malaysian population. Therefore, this study proposes suitable housing and environment by considering their special needs, such as accessibility, transportation, safety and security, elderly-friendly facilities, and community centres. In order to cater to their spiritual needs, the housing should provide the following: privacy, religious space, and mosque as a centre of community. The Muslim view towards a home is not only as a shelter and to meet basic needs, but it is also a place of worship. Therefore, the environment should reflect their will, especially in terms of the comfort of performing worship at any time. However, the extension of the housing genre, design, and implementation towards all the elements should be enhanced and addressed in the next research. Hence, phenomenological approaches in detailing the variables are recommended to look at their perspectives appropriately and the view from the stakeholder and developers as the implementer that needs to be deliberated precisely.

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MEASURING TECHNICAL EFFICIENCY OF MALAYSIAN REAL ESTATE INVESTMENT TRUSTS: A DATA ENVELOPMENT ANALYSIS APPROACH

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Abstract

The research examines the technical efficiency (TE) and economies of scale for the Malaysian Real Estate Investment Trust (M-REITs) from 2010 to 2014, using a non-parametric approach of Data Envelopment Analysis (DEA). The non-parametric approach of Variable Return to Scale DEA (VRS-DEA model) was used to estimate the efficiency scores for M-REITs. The negative inefficient value for the technical inefficiencies is identified as a result of both poor input utilisation (managerial inefficiency) and failure of M-REITs to operate at optimum scale (scale inefficiency). The mean technical efficiency (TE) measures ranged from as low as 41.70% in 2011 to as high as 84.30% in 2014. Despite having the Sharia requirement, Islamic REITs in Malaysia provide an effective investment opportunity evidenced by the higher scores for all efficiency measures, as compared to conventional REITs for the period under study. Pure technical inefficiency has a greater deviation in the efficient frontier than scale inefficiency, suggesting that M-REITs inputs are not fully minimised to produce more outputs. With regard to scale inefficiency, M-REITs are operating at economies of scale, indicating the importance of expansion or growth to improve on efficiency performance. This will then allow M-REIT managers to formulate better strategic investment decisions.

Keyword: ata envelopment analysis; efficiency, REITs; Scale; Technical

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INTRODUCTION

Real estate investment trust (REIT) managers need to evaluate the performance of their REITs in order to survive and stay competitive in the global market. Therefore, many real estate researchers have tried to measure the performance of these REITs using a variety of measurement methods. Previous studies in real estate performance measurement focus on conventional methods such as the mean-variance portfolio theory of Markowitz (Markowitz, 1952, 1959, 1991), Sharpe ratio (Sharpe, 1966), Treynor ratio (Treynor, 1965) and Jensen's alpha ratio (Jensen, 1968) with limited studies focused on methods for modern performance measurements such as efficiency and productivity.

The REIT efficiency measurement has become the main concern in the investment portfolios of developed countries. However, limited studies have been conducted to measure the REIT efficiency of emerging markets such as Malaysia. This paper, therefore, intends to address this gap by measuring Malaysian REITs (M-REITs) efficiency, post Global Financial Crisis (GFC) using the non-parametric approach of Data Envelopment Analysis (DEA). The efficiency measurement benchmarks an REIT performance against its peers, which allows the REIT manager to identify the sources of inefficiency and the best practice operation to be adopted. For instance, if scale is found to be the source of inefficiency, scale efficiency scores measured by DEA will provide information for the REIT managers as to whether an REIT is operating at increasing return to scale (IRS) or decreasing return to scale (DRS). REIT managers will then use this information to formulate a strategy to ensure that REITs operate at the optimum size or the most productive scale size. The results of the efficiency scores can also be used by REIT investors to benchmark and identify potential investment prior to investment portfolio construction.

LITERATURE REVIEW

Efficiency could be defined as "using a specific quantity of resources to get the largest possible output at the lowest possible price" (Lindeman, 2002, p.85). Therefore, efficiency needs to be addressed to avoid the wastage of resources or factors of production, in order to achieve the optimum production. The efficiency scores determine the efficiency of the REITs, as the greater the efficiency scores, the more efficient the REITs are. These efficient REIT can produce more output, given the same level of inputs.

Measuring the efficiency of firms was first introduced by Farrel (1957), which created the basic concept of efficiency measures and discussion of frontiers. Many studies measure the REIT efficiency using the parametric approach or non-parametric approach, in which REIT operating efficiency is indicated by economies of scale. The initial REIT efficiency study by Bers and Springer (1997) used translog cost function for US REIT, and they discovered significant evidence of economies of scale for REITs. A year later, Bers and Springer (1998) identified the two significant sources of economies of scale for

REITs as general and administrative expense and management fee. Similarly, Sham, Sing, and Tsai (2009) used the semi-log quadratic models where the Asian REITs show significant economies of scale in all expenses, except property management fees. REIT managers, therefore, need to emphasise these operational expenses for greater efficiency. Topuz (2002) used both the parametric approach of Stochastic Frontier Analysis and the non-parametric approach of Data Envelopment Analysis (DEA) to measure the allocative and technical efficiency of US REIT. They found that the US REIT industry on average has low efficiency scores. Similar results are produced using the non-parametric approach of DEA where most US REITs are found technically inefficient, due to scale inefficiencies and poor REIT input utilisation (Anderson & Springer, 2003; Anderson, Fok, Springer, & Webb, 2002; Topuz, Darrat &Shelor, 2005).

The non-parametric approach of DEA is considered as a viable technique and is comparable with the conventional performance measurement, due to the fact that there is a highly correlated relationship between the DEA efficiency score with traditional REITs' performance measures, such as in the Sharpe, Treynor, and Jensen index (Brockman, Mcleod, & Anderson, 2006). The results highlight the importance of being efficient, because efficiency will lead to an improvement in the profitability of a firm.

However, there are limited studies using the non-parametric approach of DEA to measure the efficiency performance for M-REITs. Chuweni and Eves (2016) measured technical, allocative and scale efficiency for Malaysian REITs for the period of 2013 to 2014. Their findings show low scores of cost efficiencies with negative inefficient value identified in the allocative inefficiencies, implying the input mix is not correctly utilised. Another study using the different efficiency formula of the ratio of property income to assets by Leong and Abdul Aziz (2015), reveals that Islamic REITs underperform the conventional REITs in terms of the efficiency ratio of assets generating property income.

The Malaysian REIT investors have questioned whether these Sharia requirements affect the performance of Islamic REIT as compared to the conventional REITs. Therefore, this study proposes a new approach to measuring the REIT performance, which incorporates the specific requirement of Islamic REITs into the measurement model. The remainder of the paper is structured as follows. The next section looks into data and research methodology. This is followed by section 3 with the results and discussion. Finally, section 4 concludes the article.

METHODOLOGY

This study is confined to all listed M-REITs for the period 2010-2014. The primary source for financial data was obtained from various annual reports, Thomson Reuters Datastream and Osiris via Bureau van Dijk, which provide the necessary financial statements. The study employs an unbalanced sample of panel

data due to the entrance and exit factor of M-REITs in Bursa Malaysia, yielding 76 observations. Since the number of M-REITs differs from 2010-2014, the construction of separate frontiers are more appropriate to determine the efficient REIT for different years (Isik & Hassan, 2002). For instance, Al-Hadharah Boustead REIT is only included in the study for the years 2010 to 2012 as the REIT was delisted in February 2014. The stapled KLCC REIT, which was listed under the REIT section starting in May 2013, is only included in the study for 2013 to 2014. The number of M-REITs used in the study increased from 13 REITs in 2010 to 15 in 2011 and 16 REITs for 2012-2014.

Data and empirical design

As illustrated in Figure 1, this study employed three input and one output variable. The three input vector variables used were x1: property operating expense (POE), x2: interest expense, x3: administrative & management expense, while the output variable was y1: total asset (Anderson & Springer, 2003; Lewis, Springer, & Anderson, 2003; Topuz, 2002; Topuz et al., 2005). The M-REIT efficiency scores were estimated in the form of technical, pure technical and scale efficiency. The efficiency scores, which are measured using the VRS-DEA model, range from 0 to 1, with 1 being the most efficient. We could also see an increase in standard deviation for the period of 2010 to 2014 due to the increase in the value for the input and output variables. The significant difference between the minimum and maximum value for input variables is likely due to the size of the REIT measured by the output.

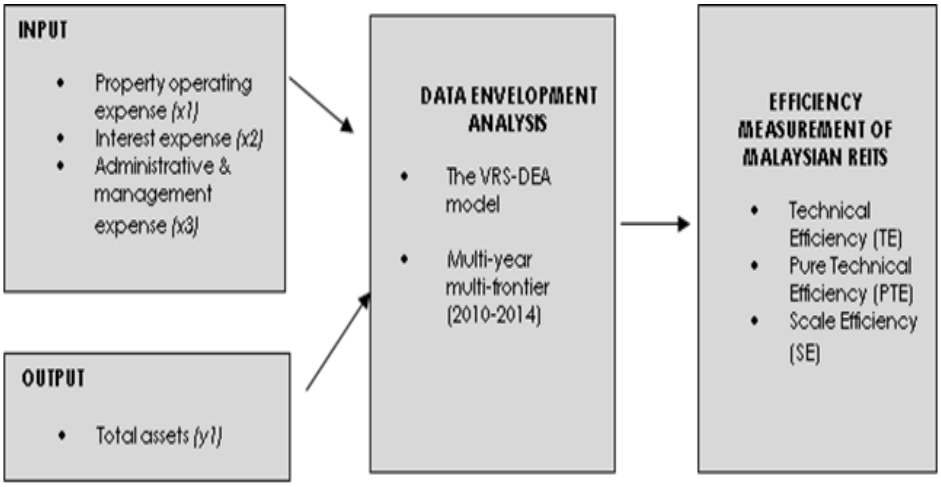

Figure 1: Efficiency measurement model for M-REITs

RESULTS AND DISCUSSIONS

Before proceeding with the DEA result, as a general rule of thumb, the sample size must be at least three times the sum of the number of inputs and outputs (Avkiran, 2004; Coelli, Prasada Rao, O'Donnell, & Battese, 2005; Sufian, Kamarudin, & Mohd Noor, 2014). The selection of a sample size of 16 was more than three times the sum of input/output number (3[3 inputs + 1 output]). Therefore, the selection was considered valid and allows DEA to measure the efficiency scores in terms of technical, pure technical and scale efficiency scores of M-REITs for the period 2010-2014.

The DEA estimation revealed that the inefficiency sources are due to pure technical and scale inefficiencies. Table 1 presents mean scores of the various efficiency scores for M-REITs (Panel A), Islamic REITs (Panel B) and conventional REITs (Panel C). The various efficiency scores are M-REITs' technical efficiency (TE), and its mutually exhaustive pure technical efficiency (PTE) and scale efficiency (SE) for the years 2010 to 2014. Results presented in Table 1 suggest that M-REITs' mean technical efficiency scores were on a declining trend during 2010 and 2011, and increased between 2012 to 2014.

Table 1: Mean efficiency scores for M-REITs 2010-2014

	Technical efficiency	**Pure technical efficiency**	**Scale efficiency**
Panel A: M-REIT			
2010	0.6560	0.7910	0.8380
2011	0.4170	0.5880	0.6580
2012	0.6360	0.7180	0.8830
2013	0.6390	0.7250	0.8880
2014	0.8430	0.8670	0.9720
Overall	*0.6382*	*0.7378*	*0.8478*
Panel B: Islamic REIT			
2010	0.8273	0.8957	0.9003
2011	0.7647	0.8543	0.8713
2012	0.7987	0.7993	0.9983
2013	0.8000	0.8167	0.9633
2014	0.9463	0.9483	0.9977
Overall	*0.8274*	*0.8629*	*0.9462*
Panel C: Conventional REIT			
2010	0.6044	0.7599	0.8188
2011	0.3295	0.5215	0.6046
2012	0.5986	0.6993	0.8562
2013	0.6012	0.7036	0.8705
2014	0.8186	0.8479	0.9668
Overall	*0.5905*	*0.7064*	*0.8234*

Source: Authors' calculation and secondary data analysis (2018)

The mean TE measures range from a low of 41.70% in 2011 to 84.30% in 2014. In other words, on average, the input (REIT expenses) could be reduced by another 58.30% in 2011 and 15.70% in 2014 to produce the same level of outputs. The declining trends of REIT efficiency could be caused by the increase in operational expenses over time, leading to REIT operating inefficiency. A study by Anderson et al. (2002) showed a similar declining trend for USA REITs for the year 1992 to 1993 before the efficiency scores increased afterwards. Another key event that could contribute to higher efficiency scores for 2012 through 2014 was the listing of the stapled KLCC REIT under the REIT section. The listing of KLCC REIT leads to a substantial increase in REIT investment value, measured by the total asset, which is a proxy for REIT output. Therefore, the REIT managers should be more cautious in implementing mergers and acquisitions with other REITs to obtain efficiency gains.

The TE, PTE and SE scores indicate the degree of M-REIT technical inefficiency and are bounded between a minimum of 0 and a maximum of 1. The decomposition of technical efficiency into pure technical efficiency and scale efficiency allows the sources of inefficiencies to be identified. In this study, the pure technical inefficiency, due to poor input utilisation, contributed a greater deviation in the REIT efficient frontier than scale inefficiency. In other words, pure technical inefficiency has dominated scale inefficiency when SE scores are higher than PTE scores for all years. The mean PTE scores ranged from 58.80% in 2011 to 86.70% in 2014 while mean SE scores varied from 65.80% in 2011 to 97.20% in 2014. The result shows the efficiency gains could be achieved with better utilisation of REIT input than the economies of scales for 2010-2014.

Our results from Table 1 (Panel B) suggest that Islamic REITs exhibited mean overall efficiency scores of 0.8274 for technical efficiency, 23.69% higher than the conventional REITs. The average scores of technical efficiency for 2010-2014 of Islamic REITs suggest the mean input waste of 17.26%. In other words, Islamic REITs could have produced the same amount of outputs by only using 82.74% of the amount of input they currently used. Similar to the industry, our result suggests that the Islamic REITs' inefficiency is mainly caused by pure technical inefficiency, rather than scale inefficiency.

Scale economies for M-REITs

The results above represent the sources of technical inefficiencies for M-REITs 2010-2014. We next turn to discuss the sources of the scale inefficiencies for M-REITs. Overall, M-REITs mostly do not operate at constant return to scale, with 47% of them operating at economies of scale or IRS. A total of 29% of M-REITs operate at the optimum size of constant return to scale, while the balance of M-REITs operating at DRS or diseconomies of scale (see Table 2). The result of the majority of M-REITs operating at IRS is similar to the efficiency measurement for US REITs (Anderson et al., 2002). REITs, which have been operating at IRS, could achieve efficiency

gains by increasing their scale of operations. In other words, these REITs could obtain benefits if they implemented growth and expansion strategies to become efficient. Similarly, as illustrated in Table 2, no M-REITs operated at DRS in 2011, with most operating at CRS and IRS. This was likely due to the recovering Malaysian economies, post financial crisis.

In essence, the sources of technical inefficiencies for M-REITs are due to the failure of M-REITs to operate at constant return to scale and managerial inefficiency in controlling costs. The Islamic REITs, on the other hand, exhibited a slightly higher mean for all efficiency scores for all years as compared to the conventional REITs, implying Sharia requirements of Islamic REITs do not hinder their investment potential.

Table 2: Return to scale for M-REITs 2010-2014

	IRS	**CRS**	**DRS**
2010	4 (30.77%)	4 (30.77%)	5 (38.46%)
2011	11 (73.33%)	4 (26.67%)	0 (0%)
2012	8 (50.00%)	5 (31.25%)	3 (18.75%)
2013	9 (56.25%)	3 (18.75%)	4 (25.00%)
2014	4 (25.00%)	6 (37.50%)	6 (37.50%)
2010-2014	36 (47.37%)	22 (28.95%)	18 (23.68%)

Note: The percentage of total may not add up to 100% due to rounding; increasing return to scale (IRS), constant return to scale (CRS), and decreasing return to scale (DRS)
Source: Authors' calculation and secondary data analysis (2018).

CONCLUSION

In measuring the TE, PTE, and SE for M-REITs 2010-2014 using the non-parametric approach of DEA, the inefficiencies are most likely caused by both poor utilisation of inputs (managerial inefficiency) and failure to operate at constant return to scale (scale inefficiency). Since managerial inefficiency has more deviations than the scale inefficiency in the M-REITs' efficient frontier, efficiency gains could, therefore, be achieved with better utilisation of M-REIT input rather by than taking advantage of the economies of scale. In other words, M-REITs can improve efficiency through minimisation of resources such as interest expense, property operating expense, and administrative expenses. In terms of scale inefficiency, most REITs are operating at economies of scale suggesting they can improve efficiency through expansion and growth. The findings will enable the REIT managers to address these sources of inefficiencies and make necessary improvements.

The REIT efficiency scores varying from zero to one, with one as efficient, could be used as the benchmark to identify the industry leaders. REIT investors could use these efficiency scores as the filtering criteria prior to the construction of their investment portfolio. The scores are helpful for REITs to identify the investment potential and add the diversification benefits of having the most efficient industry leader REITs in their portfolio. By including the Sharia requirement in the selection

of the input and output variables used in the efficiency measurement model, we pave the way for future research in the area of efficiency and productivity for the similar specific market of Sharia compliant investment or ethical investment. Our results suggest that regardless of the Sharia requirements, Islamic REITs in Malaysia provide an effective investment opportunity for the investors who seek higher profit by diversifying into Islamic REITs. This is evidenced by the higher scores for technical, pure technical and scale efficiency than conventional REITs for all years, implying the effective investment potential of Islamic REITs.

Investigating changes in productivity using the Malmquist Total Factor Productivity Index could identify the result of technical change or technological progress/regress for M-REIT 2010-2014. Further analysis in determining other key drivers of REIT characteristics, using the parametric approach, will enhance the robustness of the existing efficiency measurement model.

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RESIDENTIAL PROPERTY PRICE HIKE AND SPECULATION

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Abstract

This study analyzes the behaviour of property price in Malaysia by examining factors influencing the residential property prices. It aims to determine whether property prices hike in Malaysia can be explained by the fundamental factors or it is due to other unexplained factors, such as speculation. Findings from the study reveal that most of the factors did have significant influence on property price. In addition, the cointegration analysis indicates that the property price and its factors are cointegrated for all property market segments across states. This implies the presence of a long run relationship between the property price and its determining factors, despite slow adjustment of property price towards equilibrium in the long run. This study concludes that the residential property price hike in Malaysia is impacted by fundamental factors and is not speculative in nature.

Keywords: price hike, residential, property, speculation

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INTRODUCTION

Empirical research documents that property price is closely related to a set of macroeconomic factors and market-specific conditions, which are expected to influence both the demand and the supply side of the property market (Ciarlone, 2015). Property prices in general are influenced by economic fundamentals as well as supply and demand dynamics of the local housing market. In general, property price has been showing an increasing pattern over time worldwide (Osmadi, Kamal, Hassan, & Fattah, 2015; Kamal, Hassan, Osmadi, & Fatah, 2015; Topalov, 2018).

Literature shows that researchers use the aggregate House Price Index (HPI) to represent property price. Glindro, Subhanij, Szeto and Zhud (2011) used the HPI in their studies on factors affecting property price in Asia-Pacific economies. Similarly, studies on Malaysia also used the HPI to represent property price (Lean & Smyth, 2014; Ibrahim & Law, 2014; Zandi, Supramaniam, Aslam, & Theng, 2015; Tang & Tan, 2015). The HPI is made available by the National Property Information Centre (NAPIC). Apart from the aggregate HPI, NAPIC also publishes four sub-indices corresponding to various types of houses, namely, Terraced Houses, Semi-Detached Houses, Detached Houses and High-Rise Houses. Among the various types of houses, terraced houses seem to be the most important type of houses since it received the dominant weight in the construction of the aggregate HPI i.e. 72.7% (Ibrahim & Law, 2014). The phenomenon of property price hike has caught considerable attention from researchers and policy makers worldwide. Most studies focus on determining the factors contributing to the increasing pattern of the property price regardless of the economic landscapes. In doing so, researchers incorporate various possible factors based on different methods that may influence property price which include macroeconomic, demographic, industry, location and land/zoning (Ibrahim & Law, 2014; Pillaiyan, 2015; Tang & Tan, 2015; Kamal, Hassan, & Osmadi, 2016; Topalov, 2018).

This study analyses the relationship between residential property price hike and speculation and is focusing specifically on the following objectives:

i. To determine the significant fundamental factors influencing the residential property price hike in Malaysia for the period of 2000-2015.
ii. To examine the long run behavior of the residential property price. This includes measuring the speed of adjustment towards the equilibrium, and
iii. To conclude on the presence of speculation in the residential property market in Malaysia.

FACTORS AFFECTING PROPERTY PRICE

Several commonly cited factors affecting property price have been highlighted in previous literature like the gross domestic products (GDP) (Ciarlone, 2015;

Pillaiyan, 2015), interest rates (Ramazan, Bradley, & Bahadir, 2007; Tang & Tan, 2015), inflation (Tsatsaronis & Zhu, 2004), property loans growth (Ibrahim & Law, 2014; Pillaiyan, 2015), money supply (Koivu, 2012; Pillaiyan, 2015), stock market performance (Lean & Smyth, 2014), population growth (Jud & Daniel, 2009; Ong, 2013) and cost of construction (Jud & Daniel, 2009).

Following past literature, GDP is measured based on real GDP, interest rates based on average lending rates, inflation according to Consumer Price Index (CPI), property loans growth based on growth rate on housing loans, money supply based on M2, stock market performance according to the stock market index (KLCI), population growth based on growth in total population and cost of construction according to the producer price index (PPI).

METHODOLOGY

Research Method

To examine the relationship between property prices and the influencing factors, this study used the time-series econometric analysis including Dynamic Ordinary Least Square (DOLS), Johansen Cointegration Test, Autoregressive Distributed Lags Long Run Estimation (ARDL) and Vector Error Correction Model (VECM).

Data Collection

This study covers a period ranges from 2000 to 2015. This study utilized quarterly data spanning from Q1 to Q4 of five house price indexes (HPI) for the national as well as the states level i.e. Aggregate HPI, Terraced HPI, Detached HPI, Semi-Detached and High-Rise HPI. These data are sourced from NAPIC (www.napic.jpph.gov.my).

The data series were transformed into logarithm for consistency and standardization of measurement, obtaining linearity and reducing the problem of heteroscedasticity.

DATA ANALYSIS AND FINDINGS

Preliminary Analysis

Based on the data on the HPI, the average annual growth rates are computed to compare the rate between market segments and states in Malaysia. Table 1 shows the detail of the average annual growth in the HPI over the years (2000-2015).

Table 1: Average Annual Growth Rate per Quarter of HPI (2000-2015)

	Aggregate	Terrace	Detached	Semi-Detached	High-Rise
National	0.82	0.80	0.93	0.83	0.84
Kuala Lumpur	0.97	1.01	1.11	0.98	0.82

Selangor	0.81	0.83	0.82	0.85	0.61
Johor	0.56	0.54	0.71	0.68	0.67
Penang	0.92	1.01	0.64	0.64	1.01
Perak	0.84	0.81	1.04	0.88	n.a.
Negeri Sembilan	0.75	0.77	0.74	0.76	0.24
Melaka	0.24	0.26	0.15	0.21	0.11
Kedah	0.78	0.73	1.08	0.85	n.a.
Pahang	0.95	0.92	1.13	1.01	n.a.
Terengganu	0.98	0.91	1.14	1.04	n.a.
Kelantan	0.71	0.75	0.89	0.79	n.a.
Perlis	0.88	0.91	n.a.	0.95	n.a.
Sabah	1.12	1.11	1.38	1.16	1.03
Sarawak	0.85	0.79	1.01	0.87	n.a.

Note: n.a.= data is not available
Source: Authors' calculation and secondary data analysis

Based on Table 1, the HPI (detached) recorded higher quarterly growth rate compared to other market segments. At the aggregate level, noticeable increases are recorded in Kuala Lumpur, Penang, Pahang, Terengganu and Sabah. These states also have recorded a higher quarterly average annual growth rates as compared to the national level.

Dynamic Ordinary Least Square (DOLS) Regression

This study employs DOLS regression to determine which factors are affecting property price in Malaysia, in line with the first objective of this study. The following discussion summarizes the result according to the property market segments.

Aggregate segment

GDP influenced residential property price only in Sabah. Interest rate influenced residential property price in all states except KL, Johor, Penang, Pahang, Terengganu and Sarawak. Loan growth does not influenced residential property price in any state. Money supply influenced residential property prices in all states except Johor and Kelantan. KLCI influenced residential property price only in KL. Population change influenced residential property price only in Perlis. Cost of construction influenced residential property price in all states except Terengganu and Sabah.

Terraced segment

GDP influenced residential property price only in Perlis. Interest rate influenced residential property price in all states except KL, Johor, Pahang and Sarawak. Loan growth influenced residential property price in Sabah and Sarawak. Money

supply influenced residential property prices in all states except Johor, Kedah, Kelantan and Perlis. KLCI influenced residential property price only in Sarawak. Population change influenced residential property price in Terengganu and Perlis. Cost of construction influenced residential property price in all states except Kedah, Terengganu, Kelantan and Sarawak.

Detached segment
GDP influenced residential property price in Penang, Perak, Kelantan and Sabah. Interest rate influenced residential property price in all states except KL, Penang, Melaka, Pahang, Terengganu and Sarawak. Loan growth influenced residential property price only in Johor. Money supply influenced residential property prices in Selangor, Johor, Penang, Perak and Sarawak. KLCI influenced residential property price in KL, Selangor, Kedah and Sabah. Population change influenced residential property price in Negeri Sembilan and Kelantan. Cost of construction influenced residential property price in all states except Melaka, Pahang, Terengganu, Kelantan, Perlis and Sarawak.

Semi-Detached segment
GDP influenced residential property price only in Sabah. Interest rate influenced residential property price in Melaka, Kedah, Pahang, Terengganu, Perlis and Sabah. Loan growth influenced residential property price in KL, Selangor, Johor and Kedah. Money supply influenced residential property prices in all states except KL, Johor, Pahang, Terengganu, Kelantan and Sabah. KLCI influenced residential property price in KL, Selangor and Penang. Population change influenced residential property price only in Kedah. Cost of construction influenced residential property price in all states except Penang, Pahang, Terengganu, Kelantan and Sabah.

High Rise segment
GDP influenced residential property price in Melaka and Sabah. Interest rate influenced residential property price in KL, Selangor, Negeri Sembilan, Melaka and Sabah. Loan growth influenced residential property price in Penang and Sabah. Money supply influenced residential property prices in KL and Penang. KLCI influenced residential property price only in Negeri Sembilan. Population change does not influenced property price in any state. Cost of construction influences residential property price in KL, Selangor, Johor, Penang, Negeri Sembilan, Melaka and Sabah.

In conclusion, this study found that the HPI are influenced by the identified factors. However inconsistencies are reported. For example, for detached segment, GDP is found to influence the property prices in Penang, Perak, Kelantan and Sabah but not in other states. Comparing between the factors, it is observed that the cost of construction and interest rates are the dominant

factors influencing residential property prices (across states and market segments). The least influencing factors are loan growth and population change. In term of states, it is found that Kelantan, Terengganu and Pahang are the least influenced by the fundamental factors. Overall, the DOLS regression results indicate that the property price in Malaysia is explained by the fundamental factors.

Johansen Cointegration Test

This study proceeds with the co-integration test to examine the presence of co-integration between the property price and the identified factors. The presence of co-integration will indicate the existence of long run relationship between property price and the identified factors. A long run relationship will eventually establish equilibrium between property price and its factors.

Table 2: Johansen Co-integration Test

Segment	National	KL	Selangor	Johor	Penang	Perak	N 9
Aggregate	4	3	4	2	3	2	2
Terraced	4	3	4	2	3	3	2
Detached	2	2	2	2	2	2	2
Semi-D	4	3	3	2	3	4	2
High-Rise	3	3	3	3	2	1	3

Segment	Melaka	Kedah	Pahang	Terengganu	Kelantan	Perlis	Sabah	Sarawak
Aggregate	2	2	2	2	2	2	2	2
Terraced	2	2	3	3	2	2	3	2
Detached	2	3	3	2	2	-	3	2
Semi-D	2	2	2	2	3	3	3	2
High-Rise	3	-	-	-	-	-	4	-

Notes: The above numbers represent the Trace test. The test indicates the number of co-integrating equations at the 0.05 level. Johansen Co-integration tests were based on the assumption of a constant and no trend in estimation equation.
Source: Authors' calculation and secondary data analysis

Based on Table 2, property prices and factors are co-integrated for all the property market segments, hence indicating the presence of long run relationship between property price and its determining factors. With the presence of co-integration between property price and factors, this study further analyzes the significance of the long run relationship in the following section.

ARDL Long-Run Relationship

This study employed the ARDL to determine the long run relationship between property price and its factors, in line with the second objective of this study. In conclusion, the study found that there exist a long run relationship between

residential property price and the influencing factors. However, inconsistencies are reported. For example, at the semi-detached segment, interest rates influenced the property prices in Kuala Lumpur, Selangor, Penang, Perlis and Sabah but not in other states. Comparing between factors, interest rates was the most dominant factor influencing residential property prices (across states and market segments). The least influencing factors were loan growth and population change. These results enhance our earlier finding based on the DOLS regression.

Vector Error Correction Model (VECM)

The presence of a long run relationship leads to the establishment of equilibrium whereby any deviation from equilibrium will eventually converge to equilibrium and stabilize. Following this, there is a need to examine the speed of adjustment (convergence) to equilibrium. As an example, in the long run, when the property price deviates from its equilibrium, it will converge at a certain speed of adjustment to its equilibrium. For this purpose, the VECM is suitable in measuring the speed of adjustment. The speed of adjustment is represented by the error correction term (ECT) in VECM.

Table 3: Error Correction Term (ECT) (λ)

Segment	National	KL	Selangor	Johor	Penang	Perak	N9
Aggregate	0.0291	0.0938	0.0647	0.0021	0.0309	-0.0832	-0.0453
Terraced	0.0145	0.0679	-0.0476	0.0101	-0.0188	-0.3403	-0.0216
Detached	-0.1420	-0.2718	-0.1499	-0.0503	0.0883	-0.0284	-0.2807
Semi-D	0.0619	-0.0431	0.0078	0.0331	0.0338	-0.3387	-0.2901
High-Rise	0.0399	0.0875	0.0317	0.0402	0.0380	n.a.	-0.1789

Segment	Melaka	Kedah	Pahang	Terengganu	Kelantan	Perlis	Sabah	Sarawak
Aggregate	0.0273	-0.0519	0.0146	-0.0146	-0.0289	0.0281	-0.0489	0.0440
Terraced	0.0298	-0.1302	0.1013	0.0730	0.0605	0.0240	-0.1897	-0.0193
Detached	-0.0026	-0.3208	-0.0621	-0.1418	-0.1018	n.a.	0.0575	0.0212
Semi-D	-0.0488	0.0505	-0.0170	-0.0241	-0.0397	-0.1195	-0.0588	0.0494
High-Rise	-0.3059	n.a.	n.a.	n.a.	n.a.	n.a.	0.0006	n.a.

Notes: n.a. = data is not available
Source: Authors' calculation and secondary data analysis

Table 3 shows the significance of the ECT for all the property market segments. This indicates the presence of adjustment towards equilibrium. Comparatively, the detached segment has the highest rate of adjustment compared to other market segments. However, the magnitude of the adjustment was too slow. For example, for terraced, the speed was merely 1.45% (national). As a rule of thumb, the speed of adjustment ( ) must be between -2 < < 0. This

finding supports the previous finding of Ibrahim and Law (2014) in which they recorded speed of adjustment of 10% (Aggregate National) and 13% (Terrace National) but no adjustment for other property market segments in their study on Malaysian property market.

Based on the ARDL and the VECM, this study concludes that despite the existence of the long run relationship between property price and its factors, convergence to equilibrium is too slow. This indicates a persistent deviation of property price from its equilibrium. This finding therefore supports Tang and Tan (2015) conclusion on the inefficiency of property market price in Malaysia.

CONCLUSION

The increasing trend of property price in Malaysia has raised the attention of many parties, be it from home buyers, investors, researchers, policy makers and economists. Factors influencing property price have been widely discussed and numerous factors have been examined by past researchers in the attempt to better understand the property market price behavior. Some common factors in the literature display consistent results whereas others are specific to particular economies and market segments. Accordingly, this study examines the factors influencing property price in Malaysia.

The findings from this study show that based on the different segments of property prices (aggregate, terraced, detached, semi-detached, high-rise) at the different states, most of the factors do have significant influence on residential property price hike. By examining the national and states level data, this study differs from the previous studies such as Pillaiyan (2015) that concludes the presence of speculation in the Malaysian property market. Pillaiyan (2015) concludedthat the property price has deviated from the economic fundamentals for the last 15 years due to insignificant influence of GDP on property price based only on the national data (aggregate). Having analyzed the national and states level data, this study hence provides rigorous information on the behavior of property price in Malaysia.

This study expands the analysis and looks into the dynamic nature of the property price by examining the long run behaviour of the price and its association with the identified factors. The co-integration analysis indicates that the property price and its factors are co-integrated for all property market segments across states, hence implying the presence of a long run relationship between the property price and its determining factors. By using the ARDL to determine the long run relationship between property price and the factors, this study found that most of the factors significantly influence property price in the long run.

This study however recorded a slow adjustment of property price towards equilibrium in the long run. This implies a persistent deviation from price equilibrium reflecting inefficiency in the residential property market in Malaysia.

The inefficiency could be attributed to the slow response in supply of housing units in responding to demand due to among others, land scarcity and preference of developers in building specific residential projects.

In conclusion, with the significant influence of factors affecting residential property prices and the presence of long run integration, this study concludes that the residential property price hike in Malaysia is supported by fundamental factors and is not speculative in nature.

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3D CITY MODELING USING MULTIROTOR DRONE FOR CITY HERITAGE CONSERVATION

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Abstract

This paper aims to construct a 3D Malay city based on data collected from DJI Phantom 3, a multi rotor drone, and further analyse the urban form of traditional Malay cities using 3 main urban form components which are buildings, land use and streets. Kota Bharu was selected as the study area and the flight mission produced 793 images which were processed in Agisoft and further constructed 3D GIS in ArcGIS 10.2. The analysis of urban form shows that the old traditional development in north-north west still maintain the identity of Malay urban form, of the organic pattern of streets, preserve Malay architectures and the type of land use for traditional settlement. This finding shows that, Malay values in cities and architecture still remain and it must be preserved from any development and it can be a benchmark on adapting technologies and shifting methods in conservation and safeguarding our heritage cities in Malaysia.

***Keyword*:** Multirotor Drone, 3D modelling, Mapping, Malay urban form and urban planning

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INTRODUCTION

Drone technology or unmanned aerial vehicle (UAV), nowadays, keeps on developing and spreading, in line with the needs of the technology in daily life. The research and invention of the technology keep on growing and rapidly evolves. Two types of UAV systems are fixed wing and rotary. Rotary has almost the same design concepts with a helicopter except it was designed with single or multirotor. A rotary UAV system with a single rotor has the same structure with a manned helicopter, while a multirotor has more than one motor (Lin et al., 2011; Zhang et al., 2012). There are many models of drones and UAVs in the market, varies from multirotor types and fixed wings types carrying different functions and purposes (Hassanalian, 2017). Drones nowadays can be recognized as a tool for data collection related with aerial images. The conventional method of using a helicopter or an aeroplane involves large amounts of money compared to drone technologies which are cheaper. The usage of drone technologies in urban planning becomes more important in helping decision making, especially in the data collection process that relates to physical development.

Three-dimensional (3D) city models represent and animate all urban features including buildings, streets, open spaces on a computer platform. A 3D model shows what is going to change and happen at the end of a new design. It explains the results of recommended changes visually. To reach a beneficial decision, it convinces decision makers by providing sufficient argument in simulating real world and reconstructing a planned project to predict a possible result. 3D models make processing the real world easy and there are many applications for 3D modelling in urban planning especially when dealing with contemporary urban issues. The data generation process is conventionally manual and all of them comprise the whole historical, archeological and constructive information required to understand the heritage structure and its evolution over time (Messoudi et al., 2018). The creation of 3D models of heritage cities and sites in their current state requires a powerful methodology that is able to capture and digitally model the fine geometric and appearance details of such sites. Digital recording, documentation and preservation are demanded as our heritages (natural, cultural or mixed) suffer from on-going attrition, wars, natural disasters, climate change and human negligence. In particular, the built environment and natural heritage have received a lot of attention and benefit from the recent advancement of range sensors and imaging devices (Clarke, 2014; Li et al., 2008; Li et al., 2009). Nowadays, 3D data is a critical component to permanently record the form of important objects and sites, so that, in digital form at least, they might be passed down to future generations. Although digitally recorded and modeled, our heritage requires more international collaboration and information sharing to make them accessible in all possible forms and to all possible users and clients.

Recently, drones or Unmanned Aerial Vehicles (UAV) were used to obtain 3D mapping and models. This inexpensive equipment is capable in making

sophisticated maps. Small and portable drones are quickly deployable. They carry lightweight digital cameras that can capture good quality images. The capabilities of drone applications have been tested in many projects (Greenwood, 2015). Using drones, 3D models can be generated from either nadir imagery (shot vertically straight down) or oblique imagery (from an angle to the side), but the most detailed model combines both into a single representation. To generate a 3D model, a software requires hundreds of overlapping still images. The arrangement of flight planning consists of its flight route, percentage of overlapping, number of images, sensors, altitude and geo-referencing (Greenwood, 2015). Pix4D and Agisoft PhotoScan are the two most well-known paid aerial imagery and photogrammetry processing choices with relatively simple user interfaces and comprehensible manuals, as well as an established track record of use for professional aerial mapping applications. Both programs are regularly updated and improved upon, as the demand for UAV mapping and the market for photogrammetry software expands. The consideration of these aspects will make this flight different from other usage of drones.

In the context of Malay urban form, it is stated that the formation of its city was based on the ruling systems where the King is the state ruler and has very powerful influence in decision making and also the factor of natural elements as well as geographical conditions (Harun & Jalil, 2014). The urban morphology and figure-ground of estuary towns in the Malay states have almost identical characteristics. Palaces as centres of governance were built overlooking wide open spaces or squares. Located close to the palaces were mosques, buildings for ministerial use, buildings for the ruling institution (government buildings) such as court houses and district offices, market and commercial stores and public dwellings. The royal institution may be seen as an agent of urban morphology and this was proven with the construction of buildings and settlements around the palace grounds as well as from other urban elements that were planned and laid out in such meaningful patterns. Therefore, this study attempts to construct a 3D Malay city based on data collected from the multi rotor drone DJI Phantom 3 and further analysis of the urban form for traditional Malay cities using 3 main components, which are buildings, land use and streets. Kota Bharu has been selected as the study area and this study expects to be a benchmark of shifting to technologies in conserving and safeguarding our heritage cities in Malaysia specifically.

Study Area

Kota Bharu, significantly means “New Fort” which resembles the establishment of the new city in 1845 (Fig. 1). Traditional Malay cities use fort boundaries to resemble their main city boundaries which contained the administrative centre for the city. Istana Balai Besar was the royal symbol for Kelantanese and it was one of the early palaces of Sultan Kelantan which was built during the 18th century.

Sultan Muhammad II built Istana Balai Besar as a new palace and as the administrative centre in Kota Bharu. From that point, the development of Kota Bharu was planned by a local planner and architect. During that time, Kota Bharu grew as an established city until the British came to Kelantan during the 19th century. The location of Istana Balai Besar was near the river and surrounded by existing communal areas are factors for the site selection of the construction of the new palace.

Figure 1: The location of the study area with identified 500-meter radius from the main palace

MATERIAL AND METHOD

Material and software

There are two types of data that were used in this paper which are primary data and secondary data. Primary data represents data collected using the multirotor drone, while secondary data consists of old maps, land use maps, GIS data from the local authority and also the historical data of Kota Bharu. All the data are categorized under materials needed to produce the 3D GIS model. Several software were used as tools for data sorting, data processing, 3D model constructing and for analysing the results. The multirotor drone was used as the tool for capturing aerial images data. There are a few factors for the drone type selection, such as cost involved, coverage of the area, and also the compatibility of software to run the research. The DJI Phantom 3 drone was selected for the data capturing processes. Table 1 describes the specification of this equipment.

Table 1: Specification of Multi Rotor UAV used in this study

Specification	**Description**
UAV System	Multi rotor (4 rotors)
Model	DJI Phantom 3 Standard
Battery Weight	365 grams
Flight time	25 minutes

For flight planning, we used Pix4dcapture in setting up the waypoints for our flight mission. The Agisoft software was used when processing drone images. GIS software such as MapInfo and ArcGIS (City Engine) were used in finalizing the urban form analysis.

Methodology

The methodology can be divided into four main processes which consists of flight preparation, data pre-processing, 3D GIS model and urban form analysis. The process flow can be seen in figure 2 as shown below.

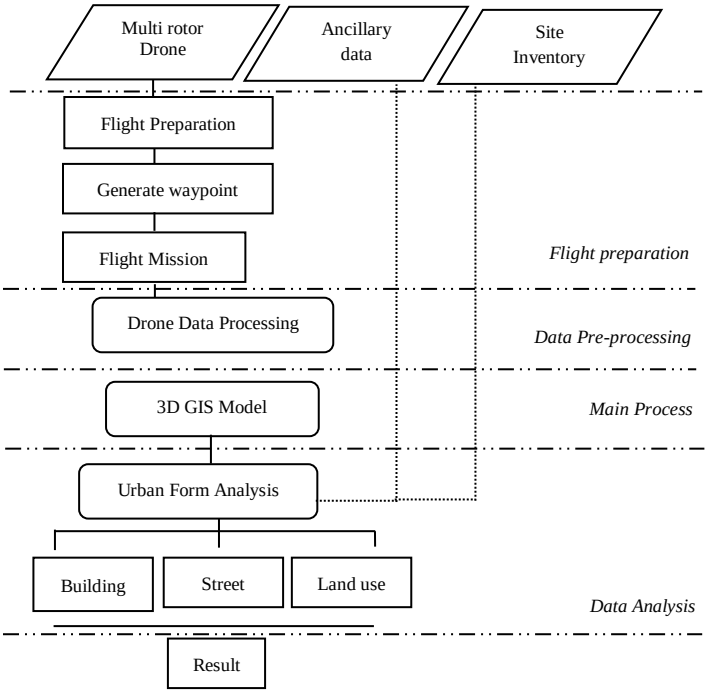

Figure 2: Flowchart of study methodology

There are four main phases of methodology conducted in this study which are flight preparation, data pre-processing, main process and data analysis.

Flight Preparation

This stage discusses flight planning or flight preparation. There are a few important elements to be syhnronized to ensure the quality and make the imageries suit our objective. The elements consist of the route, image overlapped, altitude, sensor and georeferencing. Aerial image acquisition of this drone was conducted on 23rd September 2017. Drone mapping missions are designed to ensure each image adequately overlaps with subsequent images, making it possible for processing software to merge the image. To achieve a certain image overlap, we need to balance the speed of flight with the interval at which the camera is taking pictures, the altitude of the flight, the distance between the transects, and the internal geometry of the camera. The double grid mode sets 2x standard 2D grid paths@90% to each other, with a camera angle of 45^{o} to pick up data from a vertical façade. The altitude of the drone was set to 150 meters to avoid tall buildings and only a portion of the area was set to an altitude of 200 meters to avoid losing signal because of telecommunication towers in the area. The minimum overlap setting was frontal 80% and side 65%.

Three ground stations were set up in the site to launch the drone. We captured 793 images, and each of them contained parameters such as projection file, WGS 84 coordinate data and Z-axis data, and these information is useful for constructing the 3D model of the city. Using PIX4dcapture, the flight path was set up to fly in a rectangular path rather than a circular path because a circular flight path is most suitable for single building data collection.

Data Pre-processing

Data pre-processing represents the stage where we obtained 3D models from the drone imageries. Raw drone images were downloaded into a computer after a flight mission is completed. Each image was saved in a JPEG file format and the quality of images were checked. Image errors such as blur and color balancing are some of the quality problems due to altitude differences during the flight mission. To generate a 3D map, the Agisoft software requires hundreds of overlapping still images. This software can automatically construct a 3D model for Kota Bharu without setting initial values and control points and it is a convenient process for this stage. It automatically aligns with the camera once all images are loaded into the software after distortion treatment. Technically, the software will search for the corresponding points and match images and the same time identified the location it have been captured. Once the photo alignment is complete, the software generates a sparse point cloud with a set of associated camera positions and internal camera parameters. A sparse cloud is adequate to produce a less detailed 3D model that doesn`t need to be precisely geo-referenced. Next, the software builds a 3D polygonal “mesh” based on the dense point cloud representing the surface of the object, like a net thrown over a three-dimensional object. For the final step, the software lays textures taken from the original

photograph over the 3D mesh, giving the original flat imagery a sense of depth and volume for the final 3D model that can be used for this study.

3D GIS Modeling

The image was processed using ArcGIS 17 for the final output. We need to specify a certain parameter to ensure the quality of the result. The parameters, such as key points, are point generated during image processing and represent a unique location in an image. Thousands of key points are generated for each image in this study. Keypoints that represent the same area in different images, known as tie points, are matched to determine where images overlap. The next parameter is Matching Image Pairs, which determines which kinds of image pairs are matched with the key points. The Aerial grid technique was used to organize an image along a grid or corridor (straight line) flight path including point cloud densification was carried out in next stage and further with textured meshed. The 3D mesh contains an accurate representation of the building as shown in the original drone imagery.

Urban Form Analysis

The analysis of urban form is to investigate the heritage trail in Kota Bharu city according to land use, streets and buildings that remain on the site. The physical form based on visualization and GIS databases of this urban form were analysed from the 3D model from the previous stage. The overlay process to carry out the structures of urban form have been conducted and compared with the existing data. The next processes further are the specific analysis on street size/hierarchy, pattern, building in height and building pattern.

RESULT AND DISCUSSION

By using Agisoft, construction of 3D GIS models were automatically done based on data captured using the drone. It means that during the data capture, the data must be accurate with minimal error and to be sure that the GPS data for each image taken was stored. The GPS data is important to align the images accordingly and ensure that there are no wrong images which are redundant that can result in an inaccurate 3D GIS model. Principally, the more images overlapped the more accurate the data.

All the overlapping images will be merged to produce a single aerial image that covers the whole area. As resulted from the rectangular shape flight path, the Z-axis data was captured and the 3D GIS model was automatically constructed based on the point cloud created after the image allignment process. Figure 3 shows overall 3D GIS models that were constructed in Agisoft software. Besides from exporting the 3D model as images, point cloud is also one of the options provided by Agisoft. Point cloud data can be used for further GIS analysis

in Argis software. For the study, the analysis was more focused on the Malay urban pattern analysis that will be extracted from the 3D GIS model.

3D City Modelling

The construction of the 3D model was carried out using Agisoft PhotoScan. Figure 3 shows the 3D Ortho model of the area covered with the images representing the types of buildings in 3D. The study area are successfully covered during the data collection process and the overlapping between the images captured was set up to 80%, the accuracy of the data collection was quite high and acceptable for the construction of 3D GIS model and aerial mapping.

Figure 3: 3D Ortho model reconstruction for Malay city

Malay Urban Form for Kota Bharu

Street Pattern

The street pattern analysis shows there are two different street patterns found at the existing site. Based on the site inventories that has been conducted in this study (Fig. 4), the two different street patterns for the study area representing the old traditional village or settlement in north-north west that already existed for the last few hundred years, while in another section of the study area was influenced by colonials especially after the British setting ups their administration in Kota Bharu. We can identify the difference that existed as an organic pattern street in the traditional settlement and more towards grid street pattern in the other areas.

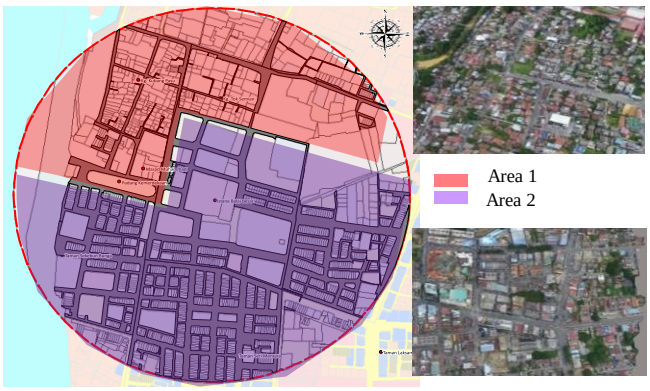

Figure 4: Malay street pattern analysis that influences the urban form at the area 1 and area 2

Building Pattern Analysis

According to the division of the development era, the analysis of building patterns in the study area was carried out. Figure 5 shows that most of the building types were housing and there are some of the houses that still preserve and maintain Malay traditional architecture elements which are significant with the identity of traditional Kelantanese architecture, while area 2 shows building patterns following British architecture style.

Figure 5: Showing varieties of building types in area 1: traditional Malay houses, area 2: British architecture in commercial areas and Istana Balai Besar that still keep Malay architecture

Land use Analysis Pattern

Land use pattern analysis shows that major land use for the study area consists of two major categories which are commercial and residential. Historically, there are evidences that show that the location of Istana Balai Besar (palace) and a few

other traditional buildings that exist since 1845 was considered as the administrative centre of Kelantan. The expansion of land use in 1845 until 1910 was dominantly for residential, while after year 1910, it was focused on commercial. The segregation of land use also shows that the state during the traditional era was focused more on the integration and social development with the location of the Palace, mosque and communal area close to each other and also the allocation for green area known as "*Padang*", and this finding is also consistent with the explanation of Harun & Jalil (2014). Figure 6 shows the distribution of traditional Malay houses at the north/north west of study area and its integration with the surrounding land use. The Palace that located at the centre which became the node of the city and supported by the mosque where are only within 200 meters from the communal area.

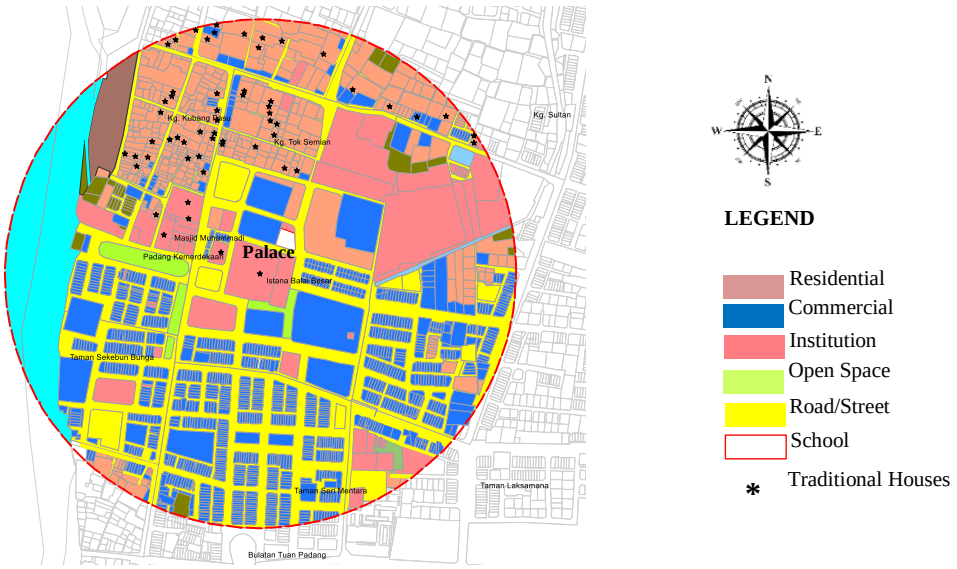

Figure 6: Categories of existing land uses and the asterisk (*) shows the distribution of Malay traditional houses in Kota Bharu

CONCLUSION

In this paper, we demonstrated 3D modeling reconstruction for the traditional Malay city of Kota Bharu using multirotor drone data and further analysis of the Malay urban form using GIS software. The potential of multirotor drones and 3D modelling were highlighted clearly. The drones can potentially be applied for the purpose of planning and conservation of heritage cities in Malaysia. These inexpensive drones are capable of making sophisticated maps that help a lot in decision making processes. Whereas 3D city models can be considered as one of the important and most helpful product in planning as visualization will improve

the efficiency in managing the planning process as well as it can be handy when dealing with decision makers, investors and communities. Based from the existing shape and form of city patterns, new development planning can be simulated using 3D city models to see the impact of a development. Geographical location, settlement formations and natural resources of early Malay towns and estuary towns in the Malay Peninsula have attracted outside influences which left significant impact on early urbanisation processes. The approach introduced in this study is expected to be the benchmark in shifting to technologies in conserving and safeguarding our heritage cities, specifically in Malaysia. Finally, for future researches, based on current challenges of this advanced world, more application of 3D city models with the integration of GIS should be developed or improved. Thus, it is recommended that for future studies, the 3D city model generated by UAVs/drones can be explored.

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HOW ICT IMPLEMENTATIONS IMPACT ON MANAGING REAL ESTATE: AT DIRECTORATE GENERAL STATE ASSET MANAGEMENT, MINISTRY OF FINANCE, INDONESIA

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Abstract

The research background identifies the opportunities as well as challenges of ICT Implementation by reviewing the existing condition compared to IT-governance best practice. This paper aims to reveal strategies from IT governance framework for overcoming the implementation real-estate information system issues. Then, this paper provides recommendations that may help the lawmakers to adopt IT-governance principles for ICT implementation in DGSAM. Data sources are from literature review of journals and articles from the electronic library to reveal the best practice on IT-governance while engaging with current situation as a baseline derived from observation. The inhibitor factors found are not solely examined from the technical perspective. In this journal, it is clarified that organisations demand IT-governance for totally transforming from conventional to modern real estate e-business. This paper enables DGSAM to be more likely to have an overview on how ICT is implemented successfully by revealing the gaps between IT-governance concept and the existing condition.

Keywords: IT-governance, E-government, online self-service, asset management, valuation, auction

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INTRODUCTION

The Directorate General of State Asset Management (DGSAM) is a government institution organised and administered under The Ministry of Finance in Indonesia who is responsible for concerning state assets, valuation, auction, and state receivables. Several actions have been taken in order to achieve its vision. Firstly, it is necessary to realise the state revenue optimisation, expenditure efficiency and state asset effectiveness. The next thing to consider is to protect state assets physically and to collect all legal documents. Thirdly, it is important to improve the government investment. Later, DGSAM has to realise accrual or fair value of state assets which can be used for various needs i.e. underlying assets. Then, it is vital to implement the effectiveness of and the efficiency in asset valuation. Last but not least, DGSAM needs to realise proper auction as a method of buying and selling industry for public domain.

The DGSAM's stakeholders are various, including but are not limited to government institutions, corporations, banks, public and personal. Several services delivered to those stakeholders consist of 13 (thirteen) types from various levels or service workplaces: headquarter, regional offices and branch offices. Referring to customer satisfaction document 2015 those 13 services contains state asset, valuation and auction at three level service workplaces as mentioned before.

The research objectives are as follows: first, to understand the current level of information systems implementation from three core business processes as a baseline of future implementation online self-service; next, to identify and consider the risk of online self-service scheme that possibly emerges without an understanding of IT governance principle, leading to the identification of contribution to current stagnant e-government implementation; third, to understand the extents of conceptual IT-governance framework and strategy implementation within three core systems at DGSAM.

LITERATURE REVIEW

IT Governance

The definition of IT-Governance varies from scholar to scholar. According to De Haes and Van Grembergen (2015), Enterprise Governance of IT is defined as "an integral part of corporate governance and addresses the definition and implementation of processes, structures and relational mechanisms in the organisations that enable both business and IT people to execute their responsibilities in supporting of business/IT alignment and the creation of business value from IT-enabled business investments". Why IT governance in an organisation is crucial? Information Technology becomes an opportunity to differentiate and to achieve competitive advantages (De Haes & Van Grembergen, 2009). Those two experts have been conducting previous research

using exploratory study method into IT governance implementations and its impact on business/IT alignment for six case organisations. Some mature organisations are commonly adopting IT to support business, and let IT lead business process transformation, such as at banking or financial system (Blanton, Watson, & Moody, 1992; Van Grembergen & Saull, 2001).

Researchers describe that without IT-Governance the risk factor has become costly for any organisations whose businesses rely heavily on IT (De Haes & Van Grembergen, 2009). Take for example how costly the negative impact of downtime on electronic auction payment system. Moreover, financial and managerial levels are questioning how much IT capital investments compared to the benefits for organisation or return on investment (ROI). A technique such as IT balance-scorecard is proposed to measure the effectiveness of IT investment not only viewed from financial perspective, but also taken from customer, internal process, and learning and growth perspective (Kaplan & Norton, 2005; Melville, Kraemer, & Gurbaxani, 2004). Therefore, any organisations who invest on IT, particularly IT- governance, benefit the entities as well as reduce the risk in their business.

To identify the role and the responsibility of IT governance implementation, an organisation needs to map the layers. In general, an enterprise is divided into three layers: strategic level, management level and operational level (De Haes & Van Grembergen, 2015). Strategic level is the place where the Board of Directors are involved; management level is where CEO, CIO and senior management take charge, while operational level is when business and IT units need to monitor the process framework. An institution requires a holistic set of framework components of governance processes, structures and relational mechanisms. Indeed, the IT alignment becomes the most significant result of the relationship between IT and business management.

Each component of IT-governance will capture and produce strategic methods for organisation. Initially, the structure component has a responsibility to formulate IT decisions and to establish a mutual relationship between business and IT management in terms of decision-making process. Secondly, the process itself means the establishment of strategic IT decision-making and IT monitoring formulation. The purpose of component process is to ensure the consistency of daily behaviours with the existing policies and to provide improvement feedback to decisions such as service-level agreements (De Haes & Van Grembergen, 2015). Lastly, relational mechanisms refer to active participation and collaboration among the executives, IT and business management in the form of job-rotation, cross training, and IT-leadership. Those tree framework components will be discussed in detail.

E-Government Index

E-government utilises Information and Communication Technology (ICT) to attain transformation and reformation by raising transparency, removing the geographical barrier, and encouraging more participation. Although E-government is not a novel concept anymore but it has always been a trend in decades for any countries all over the world to set it as a desirable goal to pursue. The United Nations E-Government recorded Indonesia in the position of 116 EGDI (E-Government Development Index) according to survey in 2016 which shows a decrease of 10 level lower than the one in 2014 with 106 EGDI. In that position Indonesia only achieved 0.4478, which is considered to be far left behind by other Southeast Asian countries; for example Malaysia (60 EGDI), Philippines (71 EGDI), and Brunei Darussalam (83 EGDI) (UNPAN, 2016). The world top rank of EGDI level is the United Kingdom of Great Britain and Northern Ireland in three consecutive years followed by Australia in the second.

E-government in Indonesia has revealed inequality of distribution due to digital division between areas and citizen. Other factors such as policies, institutions, infrastructure, applications, and planning also contribute to a different realisation levels. Developing countries like Indonesia which runs government service in a good governance for the effectiveness and the efficiency in national scale needs to measure detailed level indicators to determine and evaluate the success of e-government implementation rather than to rely on general ones (Palijama, Sumpeno, & Wibawa, 2016).

Online Self-Service

Online Self-Service is part of e-government implementation focusing on delivering public services using ICT by allowing customers directly interact digitally through internet without meeting them in person. Online self-service could be operated via government website, mobile application, or client server application accessible by citizens using internet connection.

The availability of online self-service apparatus alone will not guarantee to successful implementation without e-government policies and strategies applied in general and by upgrading specific sectors for the delivery of services. Similar to e-government, online self-service also has a measurement index which the result is close to each other. Indonesia is a part of the middle group of countries, determined by the level of Online Service Index (OSI) which is between 0.25 and 0.50 (UNPAN, 2016). It means Indonesia requires some improvements to boost the index.

Researchers argue that implementing online self-services in government organisations could bring opportunities (Table 1). There are three opportunities which are illustrated in table 1. Learning perspective to be more focus on seeking information needed by customers comes first. Customers tend to find out information initially through a website. The next thing on the list is public

participation, which means to engage more people to be involved in e-government website through online self-service as a new way to channel a request. Thirdly, customer satisfaction effects on the online self-service usage.

Table 1: Opportunities of Online Self-Services

Opportunities	**Authors**	**Explanation**
learning perspective	Jen-Hung & Stacy Huey-Pyng, 2008	E-government website that contains knowledge content, navigational aids, and interactive knowledge sharing are important
Public participation	Pinho, de Lurdes Martins, & Macedo, 2011	"*…a number of key aspects of online service quality that contributes to the increase of the use of the taxation web site... This is particularly evident for web site characteristics such as convenience, research facilities, privacy and security, speed and ease of access*".
Customer Satisfaction	Liao, Chen, & Yen, 2007	Customer satisfaction affected by perceived usefulness and subjective norm determine customer to use e-service continually.

However, the institution should be prepared to welcome any challenges when online self-services are implemented. Each institution has its own characteristics, therefore, generalization is not allowed. Cost is like a double edge sword. In the short period of time, it might be seen as liability. However, in the long run, in terms of working hour and operational cost, it can be classified as efficiency gain. Lack of organisational e-government concept would only be posed as the challenge to the successful implementation of e-government initiatives (Nkohkwo & Islam, 2013).

Table 2: Challenges of Online Self-Services

Challenges	**Authors**	**Explanation**
Funding / High Cost	Angelopoulos, Kitsios, Kofakis, & Papadopoulos (2014).	Government needs to allocate budget to provide infrastructures such as hardware, software and people.
Security and Privacy	Gefen, Warkentin, Pavlou, & Rose, (2002)	E-government exposes online service users to unique threats to data privacy and the security of information.
Integration	Simon (2013)	The integration of many IT applications and data either inside or outside the organisational

		boundary.
Technical Infrastructure / Digital Divide	Ebrahim & Irani (2005); Nkohkwo & Islam (2013)	Infrastructural aspects, the most important themes such as ICT infrastructure, internet access and connectivity and power supply (Nkohkwo & Islam, 2013).
Shortage IT Skill	Chen & Gant (2002); Ebrahim & Irani (2005)	Lack of systems integrator and project management skills which are able to translate business to IT (Ebrahim & Irani, 2005).
Organisational Barrier	Angelopoulos, Kitsios, Kofakis, & Papadopoulos (2014); Ebrahim & Irani (2005); Nkohkwo & Islam (2013)	refer to structural issues such as division, poor relational mechanisms and communication between IT and business unit, and an acceptance of the strategic benefits of new initiatives by the senior management (Angelopoulos et al., 2014).

Real Estate Application Systems at DGSAM

This paper focuses on enabling factor from the implementation of application systems in three core business processes: state asset management system, valuation information system, and electronic auction. The reason of choosing those three core applications is because all of those applications represent the whole cycle of managing assets from acquisition to disposal.

The state asset management system is a representation of core business of DGSAM for managing state assets. The benefits are reduced processing time, significant cost-cutting, improved accuracy and the user-monitored quality of data. This application system succeeded in reducing time processing because it had been changing reconciliation behaviour in the previous years (from 2010 to 2014) from visiting the branch office to online reconciliation (start from 2015 until now) via internet. In addition, cost-cutting means every user of State Asset Management System can utilise features to lodge all application requirements online without visiting the office every semester. In point of fact, now the accuracy and quality allow the users to be able to analyse their data first before printing out letters or documents. Surely, with data integration, the important part of information can be acquired in order to manage data integrity in the accrual accounting.

Valuation Information System is designed for managing and controlling record of assets (real-estate and property including lands and buildings). The activity of recording data of asset is part of appraisal job-desk at the Directorate of Valuation. However, those database are strictly prohibited for public (designed for internal use only). Instead, branch office has to provide manual or paper-based if asset-assessment-reports are requested by stakeholders. In the context of

digitalisation concept, keeping information secure is a serious concern for some reasons, especially for sensitive or confidential information such as property profile. However, the stakeholders are the actual data owners. Therefore should they deserve the transparency?

What are the benefits once public service system goes online-based? We may expect the advantages such as sharing property market value, increase willingness to do transaction due to trust effect (Sonnenschein, Loske, & Buxmann, 2016). But, DGSAM are still reluctant to give online access. In some countries, like Australia, those data being monetised, to generate government income, as data market comparative.

The latter is the big issue in this system because DGSAM does not have any policy responsible for protecting an organisation's information assets. Management of information security must take into account to design and implement secure systems that will address possible threats in the future (Whitman & Mattord, 2014). It is necessary to define information security policy and explains its principal function in a successful information security program.

E-Auction is an innovation tool to convert selling method from conventional bidding to electronic one. The electronic auction has been implemented commonly in private sector such as e-bay. Nevertheless, the implementation of electronic auction becomes support strategy as well as potentially shapes new strategy (Van Grembergen & De Haes, 2009).

One advantage of applying electronic auction online-based is to increase probability to get the highest selling price. Another benefit is to eliminate geographical boundaries. Last but not least, online auction increases the competition in the competitive market. Yet, the challenges are there during the implementation. Likewise, information security has also become the main concern because it is related to the financial transaction.

Business process re-engineering is needed to simplify the complex and long procedural steps when users are willing to participate on e-auction. The readiness of the user to switch from conventional to electronic auction is still far behind the expectation with the proportion is only around 30% compared to conventional. Therefore, DGSAM must encourage sellers to switch from conventional to an e-auction, even though they face challenges. In addition, e-auction campaign to the public and business process simplification is needed to be totally transformed.

METHODOLOGY

Two methods are used to conduct this paper; first, a literature review of open access journals and articles from the electronic library; second, an observation from capturing the current condition as a benchmark. The gaps are expected to emerge when comparing elements of IT-governance to journal's findings and identifying the missing components at this current situation at DGSAM. There

should be lot of factors required to reach such an optimised maturity level (De Haes & Van Grembergen, 2009).

Searching Strategy

Steps to gather academic resources are as follows. First, define the keywords consists of "E-government online self-service" and "IT-Governance". Various academic journal sources are listed from reputable electronic libraries. Three repositories include IEEE, Scopus, and Web of Science. Then apply each keyword with some search filters. Search limited to journal articles and conference papers published between 2006 and 2016. Moreover, to get the high quality results, also apply the sorting based on the number of most citied sources. In addition, the reviewed academic publications are limited to journal articles and conference paper which have been published since 2006. Therefore, some older issues may not be identified and listed in the literature review. Instead of using only electronic databases that have been mentioned above, this paper also optimises Google scholar to find more information broadly.

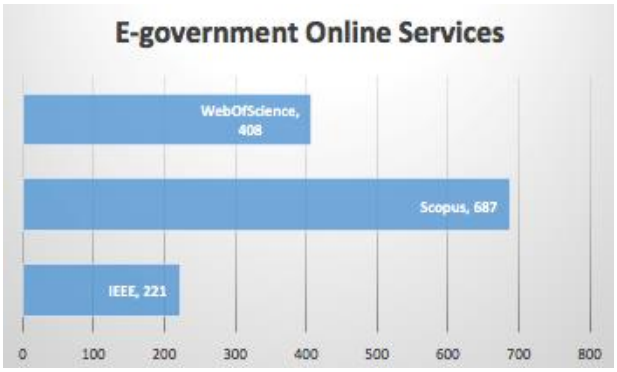

Figure 1: Databases Search Result "E-government Online Service" Keyword

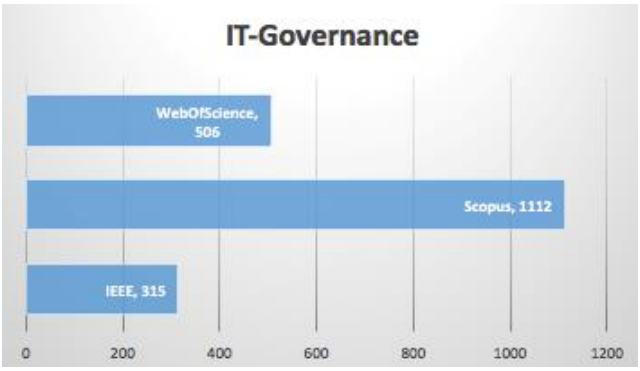

Figure 2: Databases Search Result "IT-Governance" Keyword

The distribution results from three databases can be seen at Figure 1 and Figure 2 for each keyword. Scopus generates the highest number references with 687 and 1112 (journals or papers), for E-government online service and IT-Governance keywords respectively. Although IEEE only produces 221 and 315 rows but it still needs to select relevant topics. Therefore, the next steps to choose relevant topics are by title selection and abstract screening.

Observation and Analysis Existing Condition

There are three business processes in DGSAM being discussed in this journal. Three primary core systems include states asset management system, valuation system, and electronic auction which represent each business process. State asset management system and electronic auction are already adopting online self-service system, which means external user are allowed to interact with the system through internet to lodge their application forms, while valuation system is still exclusively for internal use only. Observation methods are taken from discussion with developers, IT practitioner, and users in the recent time.

FINDINGS AND DISCUSSION

The Organisation Needs a CIO on Executive Committee

The existence of CIO in the level of Ministry of Finance seems none. From a distance, it can be considered that there are various business units available. The absence of official CIO (existing only at echelon III) in DGSAM has affected on the less-bargaining power of the IT unit role. De Haes and Van Grembergen (2009) suggest that CIO is a full member of the executive committee. It could be interpreted that CIO at DGSAM at least has full responsibility and is treated equally to Echelon II. The benefit when CIO is equal to director level is the direct reporting line to the CEO or Director General. It means that there should be a group of people who support changes. In IT unit it might be essential to hire an Echelon II who reports directly to Echelon I.

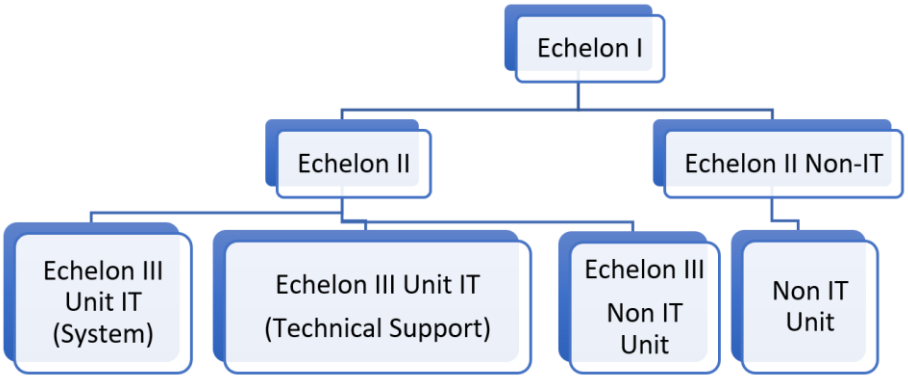

Figure 3: shows existing Structure Without Dedicated CIO

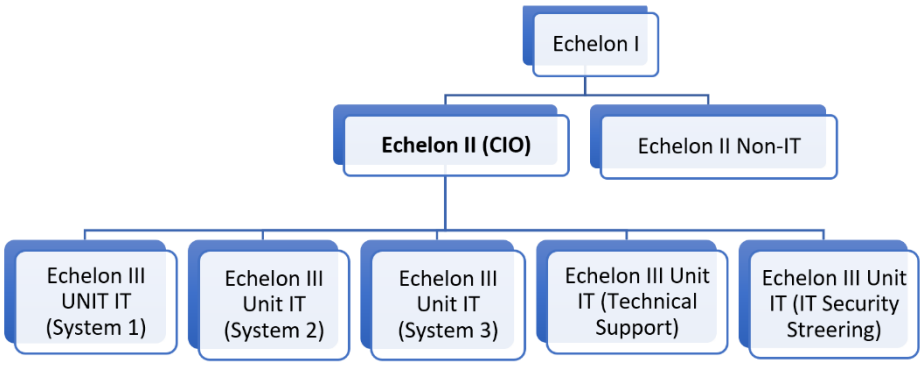

Figure 4: Proposed CIO as Echelon II

The Organisation Needs IT Security Steering Committee

Security and privacy issues are often mentioned in the financial business aspect related to transaction. Electronic auction service for instance, uses virtual account to transfer bond for requirement participation. Therefore, in order to define risk of information security this paper suggests DGSAM to provide a structure in the level of steering committee. This role composed of business and IT people focusing on IT related risks and security issues (De Haes & Van Grembergen, 2009).

The implementation in DGSAM, business people determine which data are allowed to be accessed by public while IT people design security architecture from technical perspective. Take valuation system for example. Some data are restricted for internal use only, while stakeholders have to request to business unit whenever they need data i.e. valuation unit. DGSAM needs to establish security team (Figure 4) to build trust among users by creating regulation for confidentiality, integrity and availability.

The Organisation Needs to Integrate Governance/Alignment Tasks in Roles & Responsibilities

DGSAM has to prepare the readiness of organization. Preparing documentations such as operational procedures, roles and responsibilities for each level of employee are the parallel task during application development. Ignoring the alignment task in certain roles and taking responsibilities for granted, might cause an impact on the reluctance usage continuance and ticket incident. Therefore, documented roles are needed for mapping employees and their responsibilities.

The Organisation Needs to Establish Service Level Agreement

Stakeholders seem not really satisfied with the service time frame delivery. It is proven by the low index score. According to survey in document customer satisfaction 2015, time to resolve service still becomes the main concern. In fact, it has low score: 3.92 out of 5.00 (UGM, 2015). Users demand DGSAM to deliver services on time. In addition, they also request to provide status monitoring system or notification system so then users are able to see their progress.

Uncertain processing time may arise due to the lack of IT skill, IT infrastructure or digital device. A solution to solve the problem above is by optimizing the utilisation of online service. An approach such as decision making on which services possibly could be performed by online to reduce processing time is considered. To ensure that online service delivery is punctual, it is important to set SLA, the formal agreements between business and IT about IT development projects or IT operations.

The Organisation Needs a Processes of Project Governance/Management Methodologies

Project governance/management methodologies set processes and methodologies to govern and manage IT projects. This framework is addressing the issue of shortage IT skill by deciding either internal development or hiring the third party. Indeed, the process of project governance is not terminated until development is completed in the future. Project maintenance is also important part to ensure project continuance. The best practice such as Project Management Body of Knowledge (PMBoK) is recommended. The first IT Blueprint DGSAM created in 2007, and the second had been made in 2016. Those blueprints illustrate project plan for each year.

The Organisation Needs a Processes of Benefits Management and Reporting

Executive or project sponsor needs to be convinced that their IT investment return is profitable and has significant value added. Therefore, it is an important process to monitor the planned business which benefits DGSAM during and after the implementation of the IT investments/projects. In this step, the IT unit has to analyse the benefit by utilising online service compared with traditional one then

reporting to the decision maker. For example; comparing on site reconciliation online by using state assets management system, comparing the potential capital gain of electronic bidding to conventional auction, or calculating the cost operational reduction if it is shifted to digital document on electronic auction.

The Organisation Needs Job Rotation (IT and Business People)

Business/IT alignment would be achieved by creating Job rotation. Job rotation defines IT staff working in the business units and business people working in IT (De Haes & Van Grembergen, 2009). The purpose of Job-rotation is to urge employees to have better understanding of business as well as IT concurrently. The business people have to comprehend the concept of IT implementation. Similarly, IT people should know the core business including legal aspect and regulation. It is expected to make a breakthrough from understanding both sides. That breakthrough would perceive as an innovation that might increase organisation performance and could offer competitive advantages.

The Organisation Needs Cross Training

Stakeholder's acceptance of ICT implementation, i.e. e-auction, is in line with the effort of increasing participation. Training and education services along with financial supports from government would be suggested to focus on the importance of the general attitude of implementer toward technology for technology-intensive policies (Moynihan, 2004). Target level of training might vary from internal to external stakeholders. For example, seller and buyer need education in electronic auction in term of building trust, confidence and participation, whereas an administrator of electronic auction in branch office tends to resolve probability of any problems occurred. Intensive and regular training consume money and time, therefore, online training could be an effective alternative approach.

The Organisation Needs IT Leadership

There is no position in DGSAM that generates enough power for encouraging managerial level to adopt IT as a new strategic initiative. An absence of CIO in DGSAM has contributed to lack of IT leadership, the ability of CIO or similar role to articulate a vision for IT's role in the organisation and to ensure the vision is clearly understood by managers (De Haes & Van Grembergen, 2009). In the DGSAM case, IT leadership should enable the entity to transform.

CONCLUSION

The implication of this paper for government organisation is the significant role of IT-governance to generate impact on e-government implementation. Specifically, to support online service implementation, DGSAM should re-organise structure of IT unit (existence of CIO, steering committee, and roles and responsibilities). DGSAM's processes demand to be a simplification of business

process and select which business process preferred to be online by considering the efficiency and the effectiveness. The additional cost for job-rotation scheme, upgrading employee's knowledge, IT leadership campaign could occur on the allocated budget. Suggestion for future research are : collecting two sets of data, one from a user who has no experience using online system then compare his satisfaction after switching to online-base for knowing such index of current result survey for stakeholders. Those results exploit evidence of successful implementation of the online service and to prove that e-government brings benefits compare to the conventional way.

Ubiquitous internet network is the requirement for total implementation of e-government online service. In addition, all stakeholders also require computer literacy. Therefore, to ensure fairness of survey participation equality, it is essential to all stakeholders to be ready for computerisation. However, this paper only limits three components from each framework.

This report outlines an analysis of the strategy formulation that might be adopted by DGSAM in three different aspects of EGIT framework for managing the implementation of online services in e-government in Indonesia. In the beginning, this paper through systematic literature review has gathered the global characteristics of online services implementation aspects: opportunities and challenges. The aspects of technological, social and organisational perspectives are presented such as cost, security and privacy, integration, digital divide, IT skill, and organisational barriers. Furthermore, the use of IT-governance framework is considered to overcome these challenges since it could facilitate DGSAM to achieve better business/IT alignment. Business/IT alignment, strongly leads to the high performance of business values which increases public service and customer satisfaction. Therefore, the analysis of each element in IT-governance frameworks is to obtain suitable strategy formulation in the online service context in DGSAM.

The first component framework, the structure, propose bigger IT unit than the existing one. The proposed enables to cover the need of CIO, IT security steering committee and officer, and the formulation of roles and responsibilities of business/IT to support online service implementation. The second component, the process, consists of SLA, project management, and reporting. It is also about the best practice in IT industry appliances or tools such as project management and information security management. The last, relational mechanism such as job-rotation, cross training and IT leadership should be taken into account for accomplishing ICT Implementation on managing real estate by DGSAM.

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FOREST VALUATION USING TRAVEL COST METHOD (TCM): CASES OF PAHANG NATIONAL PARK AND SRENGSENG JAKARTA URBAN FOREST

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Abstract

This study aims to estimate the economic value of a recreational park by using the travel cost method (TCM). Case studies have been done for Pahang National Park, Malaysia, and Srengseng urban forest, Jakarta, Indonesia. The data was obtained from a structured interview with visitors. The data was analysed by using Poisson and negative binomial model. Based on the survey result, it is known that the Srengseng urban forest is local public good used by local public residents whereas the Pahang National Park is visited by visitors from all over the world. The frequency determinants of visits to the urban forest are cost, age, occupation, gender, and visitor's satisfaction; meanwhile, visit the national park is affected by travel cost, age, education, income and number of visits. The TCM method utilized in this research resulted in the Srengseng Urban Forest total economic benefit of RM0.44 million per year and the Pahang National Park total consumer surplus of RM15.3 million.

***Keyword*:** recreational forest, travel cost method, economic value, negative binomial model, valuation of natural resources, consumer surplus

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INTRODUCTION

Travel Cost Method (TCM) is an economic valuation method which is also known as "Travel Cost Analysis" or "Clawson Method." This method is a "revealed preference" of economic valuation utilized for objects that cannot be valued based on the ordinary market value. The method is usually used to determine the value of area related to ecosystems and natural resources such as a national park, beach, and other outdoor tourism objects that related to ecosystems and natural resources. In general, this method will assess the value of an object by examining the time and traveling cost of individual or groups of individuals to visit the objects. The value of an object place or 'individual's willingness to pay for visiting the object is inferred from the frequency of visit and travel costs needed to visit the object.

This method is commonly used by economist to assess the value of goods that are not traded on the open market (known as passive or non-use value assets) for example the value of ecotourism. This article uses TCM with case studies of Pahang National Park, Malaysia, and Srengseng Urban Forest, Jakarta, Indonesia.

RESEARCH BACKGROUND

Urban forest and recreation parks are classified as green open spaces which have many benefits for the population, especially for residents living around the area. Direct advantages from these green areas are numerous, such as recreation, aesthetics, environmental and agricultural benefits, water catchment, or for future generations (Brander & Koetse, 2011). Also, urban open spaces also have the benefits of reducing adverse effects such as pollution, hot air, and noise.

Green open space which can also be used as housing, commercial areas or other uses (Bertram & Rehdanz, 2015), causing green space to become more limited. Provision below the optimal level is caused by a lack of information regarding public use interest. The information of economic value is needed to be considered in comparison with other alternative uses (Harnik & Crompton, 2014). Failed in considering non-market value in decision making, will lead to undersupply of good public goods and oversupply of bad public goods (Pearce & Özdemiroglu, 2002).

The value of natural resources needs to be assessed in the context of calculating state wealth. Directorate General of State Asset Management (DGSAM) under the Indonesian Ministry of Finance is assigned to manage state property of Indonesia, including valuing natural resources. Likewise in Malaysia, Valuation and Property Service Department have received several requests from state governments to value natural resources, such as a recreation of rivers and national park, to account them in states' balance sheets.

LITERATURE REVIEW

Natural resources have two benefits. They are use value and non-use value. Use value relates to usage, plan of use, or possible future use, while non-use or passive use value is related to existence value, altruism and bequest values (Bateman et al., 2002). Goods and services produced by nature and environment that are included in the use value category can be valued by money since they are tradable. Resources that do not have a market value such as the value of natural aesthetics, ecological functions, water use function, are generally not traded in the market. For this purpose, an economic valuation mainly non-market valuation is needed to determine the price or value of these resources (Fauzi, 2004).

Non-market valuation techniques can be categorized as direct method and indirect method. The direct method is carried out by asking directly to the consumers about their willingness to pay (known as expressed willingness to pay (WTP) or stated preference technique). Examples of direct techniques are the contingent valuation method (Solikin, 2017) and the contingent choice. Indirect techniques, on the other hand, do not directly determine the value. It implies from the revealed willingness to pay. Examples of the indirect technique are the travel cost method (TCM) which is usually used to measure tourism benefits and hedonic pricing method which is often used to measure assets values. Among the methods, TCM has advantages in regard to observable data, such as the behaviour of visits to tourism site. This method has its disadvantage because it is strongly influenced by model specifications.

Valuation with Travel Cost Method (TCM)

The use of TCM began in 1947 from Hotelling's letter (1947) which suggested the use of TCM to the National Park Service in the United States. Hotteling believes that there is a relationship between visitor travel costs and frequency of visits. Clawson and Knetsch (1966) then realized this method in the late 1960s, known as the Clawson-Knetsch Travel Cost Model to estimate consumer surplus for outdoor recreation.

TCM is usually used to assess the value of recreational benefits as a study by Sohngen (2000) which appraise recreational parks based on one-way trips to two objects, i.e., Ohio's Lake Erie-Headlands and Maumee Bay State. The data was randomly obtained in the summer of 1997 from visitors through a questionnaire including the purpose of visitors to the recreation park, expenses and travel costs, demographic information and visitor perceptions. This method produced an estimated value of Lake Erie recreation park of $6.1 million and Headland of $3.5 million. TCM is also used to value river economics (Johnstone & Markandya, 2005) and state parks (Liston-Heyes & Heyes, 1999). Alberini, Zanatta and Rosato (2006) applied TCM to assess the value of fish stocks in the Lagoon of Venice. In China, the coastal value along Xiamen Island of €5.35 million a year was also obtained from the method (Chen et al., 2004). All of these

studies use TCM to assess the benefits of recreational parks and the economic value of environmental resources that do not have market value.

Likewise, Indonesia has widely implemented the use of the travel cost method. The tourism objects that have been appraised are of various types, for example Batu Karas beach in Pangandaran (Zulpikar, Prasetiyo, Shelvatis, Komara, & Pramudawardhani, 2017), Merapi mount in Sleman (Dewanta, 2010), Cipondoh Lake in Tangerang (Pancawati, Saifullah, & Indaryanto, 2016), and palace heritage in Cirebon (Dharmawan, Subiyanto, & Nugraha, 2016). Valuation of urban forests includes valuation of Punti Kayu Recreational Parks in Palembang (Premono & Kunarso, 2010), a green open space in Medan (Munaza, Purwoko, & Patana, 2016), as well as Ir. Juanda Forest Park in Bandung (Akliyah, 2010).

Research Framework

Valuation of natural resources with TCM is carried out with the assumption that the value of an object of natural resources is known from the visitors' willingness to pay. It is assumed that the travel costs represent demand for the object of visit, i.e., represented by the frequency and the cost of the visit (Fauzi, 2004; Pirikiya, Amirnejad, Oladi, & Solout, 2016). When a visitor considers an object worth visit, it means his value of the object surpasses his costs of visits and to gain some consumer surpluses.

In addition to consideration of cost issues, the quality of recreation places will affect the frequency of visits. Visits to an object are usually made after visitors selected the substitution objects to be visited. In addition to income, demographic factors (for example age, gender, education, occupation), will also influence the choice and frequency of visits., the factors that influence a visit to a tourist attraction can be described mathematically by equation (1) (Fauzi, 2004; Dewanta, 2010):

$$V_{ij} = f(C_{ij}, T_{ij}, Q_i, S_j, Y_{i,} Z_i) \qquad (1)$$

Where V_{ij}= number of visit made by individuals i to place j, C_{ij}= individual travel costs i when visiting a tourist object j, T_{ij}= cost of individual time i due to visiting place j, Q_i = quality of recreation place, S_j = substitution of recreation place j, Y_i = individual income i, and Z_i = individual socio-economic characteristic i. In regression analysis, equation (1) is converted to econometric equations with the assumption of linear or other forms. It is expected that the cost variable has a negative sign, to confirm the law of demand. The other variables are expected to have positive coefficients.

METHODS

Data Collection Method

The primary data was obtained from questionnaires distributed to visitors of Srengseng urban forest and Pahang National Park. The primary data is compulsory to determine the frequency of visit, travel cost, income, perception, and demographics. The survey was conducted on weekdays and holidays as well. Respondents are 15 years and above. In additions, secondary data in the form of the number of visitors and the characteristics of the study object are obtained from secondary sources (such as reports, journals, book, internet, sources.)

Data Analysis Method

The approach used in this study is the individual travel cost method (ITCM). This method is more suitable than the zone method because the ITCM method can include socio-economic factors as explanatory variables (Blackwell, 2007). For example, this approach is used by the Directorate of Valuation DGSAM (DGSAM, 2016) to value mangrove forests in Indramayu. The steps taken in the analysis process are:

i. Conducting a regression on equation (1) with ordinary least square (OLS) or other specifications such as Poisson model and negative binomial if the frequency of visits is skewed to 1, i.e., first visit (Dewanta, 2010).
ii. Calculating consumer surplus per individual using data on the number of visits and travel cost coefficient on multiple regression result (Fauzi, 2010; Sohngen, Leichtkoppler, & Bielen, 1999). For negative binomial model the surplus is estimated using the formula $-1/\beta_1 * v_{0,}$ where β_1 is the regression coefficient of the trip cost variable, meanwhile v_0 shows the average visit (Dewanta, 2010; Martinez-Espineira & Amoako-Tuffour, 2008).
iii. Aggregating the total value by multiplying the individual surplus by the number of visitors in a given year.

Monetary data for Srengseng Urban Forest initially was quoted and analysed in Rupiah (RP), but the results are translated into Malaysian Ringgit (MR) using Bank Indonesia's mid-transaction rate for 2017 (MR1 = RP3,115.04).

RESULTS

Pahang National Park

Pahang National Park initially established in 1932 based on Wildlife Commission of Malaya Report which recommended the establishment of National Park in Malaysia. In 1936, Wildlife Department was formed followed by the enactment of Taman Negara Pahang No. 2 of1939, the enactment of Taman Negara Kelantan

No. 14 of 1938 and the enactment of Taman Negara Terengganu No. 6 of 1939; which led to the establishment of "King George V National Park." After independence, in 1960 the name was changed to National Park (*Taman Nasional*). The National Park is located in three states, i.e., Pahang, Terengganu, and Kelantan. The area of National Park is 4,343 sq km, of which 57% are in Pahang, 24% are in Trengganu, and 19% in Kelantan. In 1994 lodging in National Park was privatized to Kuala Tahan Resort (KTR) and is now known as Mutiara Taman Negara.

The main activities found in this National Park are habitat conservation, species conservation, forest management, enforcement, ecotourism, public awareness, and education. The National park is a biodiversity conservation source that is rich in natural resources consisting of increasingly rare wild animals such as elephants, tigers, and tapirs.

Pahang National Park is located in Kuala Tahan. The closest city is Bandar Jerantut. The Park can be reached from the State Capital, Kuantan, by car or public transportation within 3 to 4 hours. Apart from being rich with natural resources of wild animals, flora fauna, the Pahang National Park is famous as a recreational object worldwide. The Park provides some exciting recreational activities such as rapid shooting, night walk, canopy walking, cave exploration, river exploration, fishing, camping, bird watching, cursing and forest exploration, observing wild animals, visiting Batek native villages, climbing Mount Tahan with height of 7,174 feet and jungle walk with tracks along 210 km.

Visitors can enter The Park by buying RM1.00 of ticket per person. The fishing license price is RM10.00 per person, and the camera license is RM5.00 per one camera unit. Today the Department of Wildlife and National Parks manages National Park while the recreation is managed by the local community and the private sector. In addition to RM1.00 entrance fee per person, visitors need to pay other fees depending on the package offered by resort entrepreneurs. There are private parties that manage tourism packages which charge up to RM600.00 for four days three nights package. The number of travellers coming to National Park every year is between 71,000 and 102,000 from the 2005 to the 2016, or on average 147,815 people per year.

Srengseng Urban Forest

Srengseng urban forest is located in Srengseng Village, Kembangan, West Jakarta city, Jakarta Special Capital Region. An area of 15 hectares is used for tourism, public activities, conservation, and water absorption areas. Entrance ticket for the city forest is very cheap, at RM0.64, plus RM0.64 for a motorcycle parking ticket and RM1.28 car parking ticket.

Initially, Srengseng urban forest is a garbage dump place with sanitary landfill system. In 1994, the location was used as a water catchment area and biodiversity protection and was used as a place of recreation and community

activities. Srengseng urban forest area is founded based on the Decree of the Governor 202/1995.

In this area, 65 species of large trees grow from various types. The Srengseng urban forest is also a habitat for various wildlife. Currently, the condition of the forest as green open space is deteriorating. It happens not only in the condition of vegetation and land cover but also in the existing supporting facilities. The current management activities have not been optimal due to limitations in funding aspects.

The number of visitors to Srengseng urban forest varies throughout 2017. The number of visits is strongly influenced by weather as it is an open site. In the March-September 2017 period, it recorded an average of 2.258 visits per month, or 27,096 visitors a year. Also, the number of motorcycles entering the object was 9,845 units, and the number of cars was 1,690 units or 1.406 motorcycles per month and 241 car units per month. The annual revenue from tickets for people, motorbikes, and cars amounted to RM18,619.34.

TCM Analysis of Pahang National Park

Data on visits to National Park and Urban Forest are shown in Figure 1. Most of the visits are visitors first visit which more suitable to be analysed using Poisson Regression and Negative Binomial Model. We run the regression using these two models to get the best model for determining Consumer Surplus (CS). For the National Park, it was found that the Negative Binomial Regression Model was the most significant compared to the Poisson Model, referring to the overdispersion of these data with the Likelihood-Ratio is 0.000 (sig.). Travel cost coefficient is 0,0012666. Consumer surplus per person per visit is RM783.51. The total consumer surplus is RM15,315,269.97 which implies the value of recreational benefits.

TCM Analysis of Srengseng Urban Forest

Poisson regression and Negative Binomial are applied to TCM Srengseng Urban Forest. As listed in Table 1, there are two significant determinant variables in the Poisson model, i.e., occupation and gender variables. On the other hand, the Negative Binomial model produces cost, occupation, gender, and satisfaction score on tourist experience as significant determinant variables.

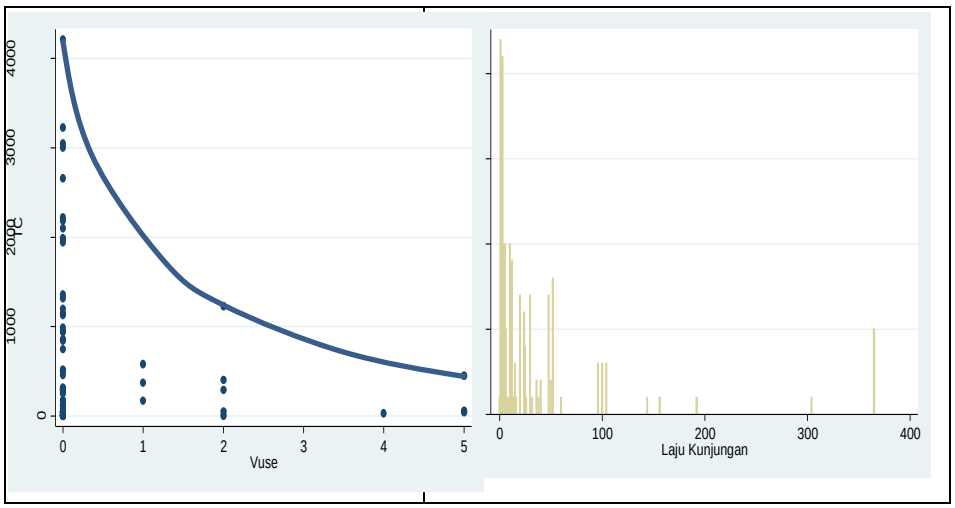

Figure 1.Plotting data visiting National Park (Left) dan urban forest (Right)
Source: Authors

Table 1: TMC Estimation results of Srengseng Urban Forest

Variable	Poisson		Negative Binomial	
	Coefficient	T stat.	Coefficient	T stat.
Travel cost	-0.0114	-1.14	-0.0132***	-3.88
Income	-0.0111	-0.43	-0.0277	-0.72
Age	0.0138	1.58	--	--
Education	--	--	0.0636	1.46
Job	0.164*	1.95	0.172***	2.84
Gender	0.447*	1.82	0.693***	2.82
Score	0.0314	0.89	0.0542*	1.72
Group	-0.0279	-0.89	-0.0290	-1.11
cons	1.347**	2.14	0.460	0.45
N	160		159	
Prob > F	0.0003		0.0004	
R-squared	0.1111		0.0208	
ML Cox-Snell R2	0.993		0.155	

Note: * p<0.1, ** p<0.05, *** p<0.01
Source: Authors

Furthermore, we used negative binomial with the cost coefficient is -0.0132 to value the economic benefits of the Srengseng urban forest. The model generates the consumer surplus per person per trip of RM24.32. As the prediction of average visit number is 23.27, we suggest consumer surplus per group be RM565.92. By noting that the average group of visitors is 3.48 people, we conclude that the consumer surplus per person per year is RM8.70 resulting total consumer surplus of RM440,640.45.

DISCUSSION

Visitors' Characteristics

The Srengseng Urban Forest visitors are residents around the object, which was inferred from data of distance, travel time, and type of vehicle used to visit the urban forest. The visitors are generally working as entrepreneurs with an average income RM1,216.68. When compared to the 2017 DKI Jakarta Provincial Minimum Wage of around RM1,078.64, the average visitors are of the lower middle class. Meanwhile, the visitors of the Pahang National Park are from high-income groups, and most of the visitors are from abroad.

The Factors of Visitation Determinant

From the eight independent variables tested in the models, only four variables were significant. The cost of travel is significant with a negative relationship, as predicted. Additionally, variables of age, occupation, gender, and satisfaction score have positive relationships with the visits. In general, our finding suggests individuals who are male, bear less cost of the visit, working as entrepreneurs, are satisfied with the experience of visiting, will likely to visit The Srengseng Urban Forest. These factors have coefficients that are consistent with the demand theory, which adds to the validity of this study.

The Comparison of Economic Value with Contribution

Based on the results of the study using TCM, each visitor receives an economic benefit of RM24.32 per visit to the Srengseng Urban Forest. This value is far above the entrance ticket price RM0.64 per person plus RM0.64 for motorbike parking and RM1.28 for car parking. The average income of the forest from the entrance ticket was RM26,644.92 per month or around RM320 thousand per year. The income value was also relatively minimal compared to the tourist value of the Srengseng Urban Forest of RM440,443.78. Thus, revenue from ticketing is only 7.3% of the value of tourism calculated using TCM. Likewise, the entrance ticket to the Pahang National Park does not reflect the real value. An RM1.00 for the entrance ticket and RM5.00 for a canopy walk is very small and does not reflect the privileges enjoyed by visitors to the National park.

CONCLUSION

Based on the survey, our findings suggest the character of respondents who visit Srengseng Urban Forest are the surrounding communities, while visitors of the National Park are both from a local citizen and from abroad. It implies that the Pahang National Park is a standard or superior good that is "consumed" not only by the surrounding community but also by the international community, while the Srengseng Urban Forest is a local public good. The study inferred five determinants of visit frequency to the park, or urban forest is costs (negative), age

(positive), occupation (positive), gender (positive), and satisfaction (positive)). Consumer surplus per person per visit is around RM24.32 for the Srengseng Urban Forest compared to RM783.51 for the Pahang National Park. The value of total economic benefits, especially tourism value is RM0.44 million for Srengseng Urban Forest and RM15.32 million for Pahang National Park.

The economic value received way far exceeds the - entrance fees paid by visitors. This finding indicates that residents around the Urban Forest place a high value for the urban forest. The local government should consider increasing the supply of such urban forest since The Srengseng Urban Forest is a public good managed by the provincial government. The provision of more public goods is expected to increase the satisfaction or welfare of the community. The improvement of urban forest facilities can provide alternative social activities for the community (Demir, 2014).

The same thing applies to The Pahang National Park. The National Park Manager can increase the price of admission to the National Park. The private sector takes advantage of the package they offer to enjoy the natural resources in the National Park area. The authorities may need to encourage the private sector to enhance the facilities available in the National park area.

Research Limitations

The analysis assumes that the Srengseng Urban Forest or the Pahang National Forest is a single tourist destination for visitors during their trips, i.e., not taking into account that visitors may get satisfaction during the trip and/or from visiting other tourism objects before/after visiting the Srengseng Urban Forest or the Pahang National Forest. This assumption may cause bias, especially for the Pahang National Park because the visitors are more likely to visit other tourist attractions in Malaysia.

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CAPABILITIES OF REVEALED PREFERENCE METHOD FOR HERITAGE PROPERTY VALUATION

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Abstract

In recent years, the increasing availability of large databases on real estate transaction has opened up new research possibilities using revealed preference method. Therefore, the aim of this paper is to investigate the capability of revealed preference method of ordinary least square and rank transformation regression models in valuing shophouse heritage property. This paper has provided the first application that consider the thin market effects by comparing the ordinary least square and rank transformation regression in obtaining the market value of shophouse heritage property. The original dataset consists of 893 commercial properties transacted from 2004 to 2014 in Kota Bharu, Kelantan Malaysia. After filtration process, only 25 units of shophouse heritage property were available and valid to be used. The findings suggest that rank transformation regression model performs better than the ordinary least square model with double-log as the best model. This suggests that rank transformation regression is capable for heritage property valuation in thin market situation.

Keywords: revealed preference method, shophouse heritage property, ordinary least square, rank transformation regression, thin market

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INTRODUCTION

Valuation of heritage property differs from valuation of other kinds of asset or property because heritage property is not being traded actively in the market. The uniqueness of heritage property makes it difficult to be valued using the existing conventional method. The most recent innovative methods used in valuing heritage property are the stated preference (SP) and revealed preference (RP) methods. Essentially, it is very important to assess the heritage property value in order to 1) acknowledge and respect the full worth of heritage asset, 2) appreciate the need for maintenance and preservation of heritage property and, 3) assist in responding to calls for more accountability for the sustained use of these assets. Due to absence of awareness, people think that heritage property is non-reproducible, non-economic and non-substitutable commodity (Greffe, 1998). There are challenges exist in valuing this assets which are to understand the meaning of heritage property (Holden, 2004; O'Brien, 2010; Yung, 2007), how to measure the heritage property, the existence of effective method (Aversano & Ferrone, 2012; Landriani & Pozzoli, 2013; Mason, 2002; Yung, 2007), and knowledge or expertise in conducting the heritage property valuation (Holden, 2004; Selwood, 2010).

Recently, the availability of property transaction database makes it possible to employ RP method. By collecting data on many different buildings, a regression analysis can be used to determine the correlation (relationship) of each characteristic to the transaction price – e.g. physical, historical, and spatial characteristics. Each of these correlations can be measured to determine a degree of confidence (i.e. significance) and then subsequently be used to build a regression model. The regression model can be useful to determine the intrinsic value of each attributes, as well as to predict transaction prices.

The study by Leichenko, Coulson and Listokin (2001) stated that most of past hedonic studies typically used data from one geographical area to run regression model. However, there will be a problem in data processing if the dataset does not contain at least 30 samples per independent variable to run a statistically acceptable regression model (VanVoorhis & Morgan, 2007). Consequently, 10 independent variables would require 300 samples. It is a fact that heritage property market is thin. Sometimes, only around 20 transactions are available for a period of more than 10 years. In order to overcome this thin market problem, the study by Leichenko et al. (2001) has expanded its data size by expanding the geographical boundary to encompass nine areas in Texas City. However, this means that the hedonic model being constructed is a general model. This may not be the most accurate model if the submarket existence which is a common feature of property market is considered. The study by Suriatini Ismail (2005) has suggested that statistically, a submarket-based can perform better than a general model.

Apart from thin market issue, previous studies also focused on the impact of historic designation towards increasing or decreasing the property value. To date, two studies, which are by Ruijgrok (2006), and Lazrak, Nijkamp, Rietveld and Rouwendal (2014) have empirically used hedonic model for assessing heritage property values by including historical attributes. Study by Ruijgrok (2006) in Netherlands was the first study that employed hedonic model for measuring heritage property values by taking into account the historical attributes. However, the study did not make correction for spatial dependencies nor the historical spatial pattern. Thus, the study by Lazrak et al. (2014) responded to this gap by taking spatial dependencies into account. However, both studies did not take into account the issue of thin market where the transactions of heritage property market are limited (not being traded actively). Many studies have struggled with problem of limited number of transactions and for that reason, many researchers have used SP method compared to RP method (Lazrak et al., 2014).

The study by Mohamad (2012) proved that rank transformation regression (RTR) can resolve the thin market issue. The statistical results of MSE are smaller compared to OLS. Therefore, the aim of this study is to evaluate the capability of RP method of OLS and RTR models in valuing shophouse heritage property with thin market circumstances. The use of RTR for measuring the value of historical building with consideration of thin market effect is novel. While Ruijgrok (2006) and Lazrak et al. (2014) focused on developed countries, this study provides empirical evidence from a developing country.

LITERATURE REVIEW

In real estate valuation, the goal of valuation process is to estimate the best possible value for specific property. There are three common approaches used to obtain the value of the property, which are sale comparison, cost and income capitalization approaches (Wyatt, 2013). Depending on the availability of the data and the type of property being valued, normally all of these three approaches do not produce the same figure for the value and not similarly reliable (Mattia, Oppio, & Pandolfi, 2012).

The focus of this paper is to determine the best method to be used in valuing historical building of shophouse using RP method by considering thin market effect. This study employs two approaches of RP method, which are the OLS and RTR. RP methods exploit the relationship between some forms of individual behavior (e.g. buying a house) and associated environmental, physical, neighborhood attributes to estimate the value. By definition, a thin market refers to low volume of market transaction which exists when there are only few concurrent buyers and sellers in the market and it is also associated with the behavior of the market (Anderson, Hudson, Harri, & Turner 2007; Jacobus, 2006).

Nonetheless, it is a real challenge when dealing with old property. In addition, the deteriorating condition of the heritage property and archaic services may affect the value of heritage property. Besides that, the heritage property is protected by policy and the restriction may affect the values and its marketability. The transaction of heritage property market is limited. The studies by Greffe (1998), Mohamad (2012), Selwood (2010) have argued about the ability of OLS in valuing residential property values of small sample size. Therefore, the authors have suggested the use of RTR in order to overcome the thin market issue. Furthermore, RTR can overcome the non-normal distribution problem and outliers. The value estimates produced by the RTR is more accurate and successful in statistical performance.

Hence, it is very difficult to apply OLS on heritage property since this method produces error which is suitable for large data. Therefore, we need an appropriate method to measure heritage property. Our literature indicates that the methods used in valuing heritage property such as Contingent Valuation (CV) Method, Hedonic Pricing Method (HPM), Travelling Cost Method (TCM) and others. However, this study will focus on RP method of OLS and RTR

RESEARCH METHODOLOGY

The study used a quantitative research method. As stated before, past studies often used SP method in valuing heritage property. Recently, the availability of detailed historical microdata makes it possible to value heritage property using RP method. This section first describes the OLS and RTR models followed by the study region and then continues with comprehensive discussion of the data to estimate the heritage property values using RP method.

OLS is an extension of the comparison method of valuation. OLS explains and evaluates the relationship between variables and other variables. The variables in OLS are divided into dependent variable Y (property price) and independent variables X (property characteristics). RTR is a simple procedure whereby the data are arranged in corresponding order i.e rank 1 for the largest observation and rank *n* for the smallest observation. The studies by Iman (1974) and Montgomery (2008) state that RTR is a robust and powerful tool to be used in hypothesis testing. This technique is widely used in many fields of study but yet to be explored in heritage property valuation. The RTR procedure considers the theory of property valuation to rank comparable properties from best to worst (Cronan, Epley, & Perry, 1986). The application of RTR takes the same steps as OLS. Nevertheless, the difference between the methods is that the RTR method is applied in rank form where all nominal data are converted into rank, including the dependent variable (property price). The estimate value is also produced in a rank form.

The secondary data on property transactions for this paper were collected in digital form from Kota Bharu State Valuation and Property Services

Department (VPSD Kota Bharu). The data contained record of commercial property transactions in Kota Bharu, Kelantan from 2004 to 2014. The data used have been provided by VPSD Kota Bharu and concerned pre-war shophouse transactions from 2004 to 2014. Over 11 years, only 25 transactions involved the pre-war shophouse. Comparing with previous studies by Lazrak et al. (2014), the total transaction data used for the study was 51 for a period of 22 years from 1985 to 2014. This paper involved a period of 11 years from 2004 to 2014 with total transaction of 25. Therefore, the observation was still valid as heritage property is classified as special property with limited transactions. The VPSD Kota Bharu has provided data on numerous transactional and structural characteristics of each transactions. The data were enriched with information obtained from Kota Bharu Municipal Council (MPKB) and site inspections especially in order to improve the data regarding historical characteristics.

The registered sale price was the actual price paid for the shophouse. Thus, the price data used in this study was transaction price. However, during filtration process, only arm's length transaction is considered. Some additional transaction-related characteristics were used as control variables such as the year of the transaction taken. The structural characteristics include floor area, land area, building improvement, building material, maintenance of the building, type of ceiling. Historical characteristics included façade status, architectural style, ensemble and authenticity.

Table 1 shows the filtering process of the original set of data from 2004 to 2014 in which only 25 observations (pre-war shophouse) remained for this study. The data were examined for completeness and usefulness to develop the RP models.

Table 1: Record of data cleaning process

No.	Notes	Number of Records Left
1	Original data from 2004-2014 for commercial property received from VPSD Kota Bharu	893
2	Excluding non shophouse property	617
3	Excluding terrace plots	406
4	Excluding incomplete and redundant data	365
5	Excluding property transaction record based on street's name. Choose only; *Jln Ismail, Jln Temenggong, Jln Che Su, Jln Dato Pati, Jln Hilir Pasar, Jln Gajah Mati, Jln Hulu Pasar, Jln Ismail, Jln Padang Garong, Jln Pos Office Lama, Jln Suara Muda, Jln Tg Putera Semerak, Jln Tok Hakim, Jln Maju*	70
6	Excluding records with share	51
7	Excluding property outside listed heritage property under Kota Bharu Municipal Council	47

8	Excluding records with incomplete or confusing information	25

RESULTS AND DISCUSSION

In this section, the results of RP method are presented and discussed, whereby the focus is to select the best model for heritage property valuation for thin market. Based on literatures, most past research found a positive impact of heritage property on property prices. In our opinion, OLS is suitable to be used for large sample; therefore, the OLS may not be the best method as transaction of heritage property is limited.

Table 2 summarised the results of OLS and RTR for functional form selection. The stepwise method was used in estimating the OLS and RTR models. Three functional forms were tested in choosing the best form of value-estimating model for shophouse heritage property. These functional forms were linear, semi-log and double-log. The tests were divided into two, which are with or without historical characteristics. The purpose is to examine whether the historical characteristics give positive or negative impacts toward property value. The result shows that the historical characteristics have significant positive effect to the property values.

The results indicate that double-log form of RTR model with historical characteristics is the best model in valuing shophouse heritage property with the highest Adj R^2 (98.7%) compared to double-log form of OLS with historical characteristics (89.6%). The SSE for RTR model is lower by 4% compared to OLS. A reduction of 17% in LL value of the OLS to the RTR model also indicates an improvement in the model's goodness of fit. A value of more than 3 indicated by AIC and AICc for the RTR model signifies an improvement to that of the OLS.

Table 3 shows the multicollinearity test for OLS and RTR models. The results indicate that the VIF values for all independent variables below 5 indicating that there was no serious multicollinearity among them (Suriatini Ismail, 2005). Table 3 also shows the significant variables for OLS and RTR models using t-test values. Both models have difference significant variables. If the variables have t-values greater than ±2 the variable considered significant (Brooks & Tsolacos, 2010). The overall t-values in RTR model were greater than those in the OLS model. It shows that the statistical performance of RTR model was better compared to the OLS model. There were five significant variables for OLS model which are year of 1) valuation taken in 2006, 2) year of valuation taken in 2013, 3) T*emenggong* road, 4) MFAlog is main floor area transform into log and 5) architectural functionalistic is referring to historical characteristics. While, for RTR models there were eight significant variables included 1) year of valuation taken in 2004, 2) year of valuation taken in 2006, 3) year of valuation taken in 2013, 4) RLAlog referring to land area transform into raking form and log, 5) maintenance_outside referring to condition outside of the property, 6)

Ensemble_harmony referring to historical characteristics, 7) freehold is referring to building tenure and 8) Floor_pergo_syntetic) is referring to type of floor material.

Table 2: OLS and RTR summary for functional form selection

Model Selection			Linear	Semi Log	Double Log
Without historical characteristics	OLS	R^2	0.804	0.804	0.803
		Adj R^2	0.765	0.764	0.764
		SSE	96088.865	0.16306	0.163
		LL	-242.702	9.745	9.716
		AIC	495.403	-9.491	-9.433
		AICc	500.019	-4.876	-4.817
	RTR	R^2	0.948	0.987	0.949
		Adj R^2	0.921	0.977	0.930
		SSE	1.5686	0.12071	0.213
		LL	-31.147	14.322	6.029
		AIC	78.294	-10.644	1.942
		AICc	92.694	9.356	12.124
With historical characteristics	OLS	R^2	0.804	0.862	0.896
		Adj R^2	0.765	0.822	0.856
		SSE	96088.865	0.14157	0.128
		LL	-242.702	13.086	15.775
		AIC	495.403	-14.171	-17.550
		AICc	500.019	-7.171	-7.369
	RTR	R^2	0.839	0.987	0.987
		Adj R^2	0.793	0.977	0.977
		SSE	2.545	0.12071	0.123
		LL	-41.807	14.322	19.026
		AIC	95.614	-10.644	-18.051
		AICc	102.614	9.356	9.449

Table 3: Summary of multicollinearity test

OLS Model			RTR Model		
Significant Variable	VIF	T-Test	Significant Variable	VIF	T-Test
Y06	1.151	-7.769	R_luaslot_log	2.554	7.119
Temenggong	3.572	5.966	Y2013	2.243	-9.464
MFA_log	1.947	5.329	Y2004	1.358	9.043
Architectural_functionalistic	3.472	-2.827	Pegangan	1.061	-6.812
Y13	1.198	2.255	Floor_pergo_syntetic	2.998	-6.272

			Ensemble_harmony	3.385	2.381
			Y2006	1.343	4.686
			Maintenance_outside	2.114	-2.326

Revealed Preference Method of OLS and RTR

Based on the functional form selection, both models of OLS and RTR indicate that double-log equation produces the best results. Hence, this section applies the selected model into observation data in order to investigate which model is better to use in thin market situation. The equation for double log-RTR and double log-OLS models are as follows:

a) The OLS model is given by:

MV = 9.848 - 0.795(Y06) + 0.235(Y13) + 0.668 (temenggong) + 0.630(MFAlog) – 0.350(architectural_functionalistic)

Where;
MV is market value
Y06 is year of valuation taken in 2006
Y04 is year of valuation taken in 2013
Temenggong is referring to road name where the shophouse heritage property is located
MFAlog is main floor area transform into log
Architectural functionalistic is referring to historical characteristics

b) The RTR model is given by:

MV = 2.305 + 0.965(Y04) + 0.497(Y06) - 1.298(Y13) + 0.407(RLAlog) – 0.883(freehold) – 1.367(Floor_pergo_syntetic) – 0.310(maintenance_outside) + 0.255(ensemble_harmony)

Where;
MV is market value
Y04 is year of valuation taken in 2004
Y06 is year of valuation taken in 2006
Y13 is year of valuation taken in 2013
RLAlog is referring to land area transform into ranking form and log
Maintenance_outside is referring to condition outside of the property
Ensemble_harmony is referring to historical characteristics
Freehold is referring to building tenure
Floor_pergo_syntetic) is referring to floor type

In order to determine the better prediction model considering thin market issue, both equations were applied to the out-of-sample observations. Table 4 and 5 show the results of MAPE's OLS and RTR according to types of observation in-of-sample and out-of-sample observations. Table 6 shows the comparison of

predictive capability between the OLS and the RTR models. The RTR model has predicted the property prices with much lower percentage of error compared to OLS model for both in-sample and out-sample. About 90% of the total number of predictions of in-of-sample and 100% out-of-sample data using the RTR model fell within 10% of the original shophouse heritage prices. According to Joslin (2005) the parameters of a sale price within another assessments should not lease ±5% to ±10% differences. Based on Table 6, it can be concluded that the RTR model is a better predictive model compared to the OLS model in valuing shophouse heritage property with thin market effect.

Based on the analysis, double-log RTR model is the best model for measuring shophouse heritage property. Therefore, the discussion is based on this model. Based on the models, there are eight significant variables affecting the value of shophouse heritage property. The significant variables are year of valuation (Y04, Y06, Y13), land area in rank form with natural log, building tenure (freehold), type of floor (pergo synthetic), outside maintenance and historical characteristic (ensemble harmony). However, year of valuation (Y13), tenure, type of floor (pergo synthetic) and outside maintenance have negative effects.

Table 4: The results of MAPE OLS and RTR according to types of observation in-of-sample observations

Sample	Price (000)	OLS in-sample	Price estimated	MAPE (OLS)	Rprice	RTR in-sample	Rprice estimated	MAPE (RTR)
1	850	13.62	824661	3%	3	1.16	3.18	-6%
2	510	13.10	488507	4%	14	2.70	14.95	-7%
3	550	13.28	583307	-6%	12	2.52	12.48	-4%
4	420	12.96	426451	-2%	18	2.89	17.98	0%
5	250	12.59	294410	-18%	19	2.95	19.15	-1%
6	530	13.10	490536	7%	13	2.55	12.87	1%
7	600	13.22	553564	8%	10.5	2.30	9.97	5%
8	800	13.59	801601	0%	6.5	1.96	7.09	-9%
9	800	13.45	694559	13%	6.5	1.87	6.51	0%
10	800	13.56	777503	3%	6.5	2.07	7.92	-22%
11	500	13.20	542321	-8%	16	2.73	15.36	4%
12	900	13.73	919826	-2%	2	0.63	1.88	6%
13	810	13.52	746486	8%	4	1.39	4.03	-1%
14	500	12.95	421579	16%	16	2.76	15.83	1%
15	600	13.56	777503	-30%	10.5	2.07	7.92	25%
16	800	13.45	694559	13%	6.5	1.87	6.51	0%
17	500	13.22	551050	-10%	16	2.70	14.95	7%

18	640	13.32	609803	5%	9	2.24	9.40	-4%
19	1,050	13.93	1119303	-7%	1	0.00	1.00	0%

Note: Cells shaded in grey indicate the MAPE values exceed ±10% differences for in-of-sample

Table 5: The results of MAPE OLS and RTR according to types of observation out-of-sample observations

Sample	Price (000)	OLS out-sample	Price estimated	MAPE	Rprice	RTR out-sample	Rprice estimated	MAPE
1	650	12.78	357513	45%	9.5	2.30	9.97	-5%
2	650	12.78	357513	45%	9.5	2.30	9.97	-5%
3	700	13.39	658116	6%	10.5	2.44	11.50	-10%
4	700	13.48	718059	-3%	10.5	2.44	11.50	-10%
5	807.12	13.15	514657	36%	3	1.11	3.04	-1%

Note: Cells shaded in grey indicate the MAPE values exceed ±10% differences for out-of-sample

Table 6: OLS and RTR predictive performance

Prediction Errors	OLS		RTR	
	In-of-sample	Out-of-sample	In-of-sample	Out-of-sample
MAPE				
≤ ± 10%	14	3	17	6
≥ ± 10%	5	3	2	0
In-sample; N =19 Out-sample; N = 6				

The historical characteristic of ensemble harmony also appears to be significant, while the reported coefficients have the expected sign and magnitude (positive). Ensemble harmony variables is defined as left, right and cross-facing neighbors of the prewar shophouse of the same architectural style.

There are two models involved in the development of RP method, which are OLS and RTR. The comparisons are made between these two methods because of thin market issue. As mentioned, the heritage property market involved limited transaction over the years. Based on previous study, OLS is widely used in real estate research. The study by Mohamad (2012) found that the property market is thin when it is divided based on submarket. This fact is also agreed by Suriatini Ismail (2005) in which she suggested, research should be conducted to identify the appropriate method and tools to be used in real estate valuation by taking into account the issue of thin market.

Therefore, this study suggests the use of RTR in capturing the thin market issue. By taking similar steps and statistical tests with OLS where the differences

are only on dependent and independent variables where those variables are in ranking form (from best to worst).

CONCLUSION

This paper has managed to establish an innovative model for valuing shophouse heritage property considering thin market effect by incorporating the ranking element in the model specification, as the RTR is the best model. The implications of this study towards real estate valuation are:

i. This study has adapted and implemented the RP method of OLS and RTR in valuing Grade II heritage property with special consideration of active market with limited transaction.
ii. It considers thin market effects and historical characteristics in valuing heritage property for more accurate, reliable and practical results.

Finally, it is very important to identify a new empirical approach that can provide a unique opportunity to make significance improvement in establishing an effective method for valuing heritage property with consideration of thin market issue. Furthermore, establishing proper historical characteristics of heritage property would be recommended for future research.

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THE INFLUENCE OF GDP, INTEREST RATE, WAGE, INFLATION AND EXCHANGE RATE ON RESIDENTIAL PROPERTY PRICE IN INDONESIA

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Abstract

Over the past years, Indonesia's economic growth has been recorded among the top developing countries. The economic growth is believed to contribute to the increase on residential property prices. The main objective of this study is to analyse the influence of determinants of residential property prices in Indonesia by examining the dynamic relationships of residential property prices reflected through the Residential Property Price Index (RPPI) with Gross Domestic Product (GDP), investment interest rates, wages, inflation and the exchange rate against the US dollar using secondary data over a period of thirteen-years between 2002Q1 and 2014Q4. By applying the Engle-Granger co-integration test and the error correction model, this research aims to see the relationship between the variables both in the short- and long-term. The results of the study indicated that macroeconomic factors that were significantly related to Indonesian residential property prices were GDP, wages, inflation, and exchange rates against the US dollar, while the investment interest rate was not included in these factors. Furthermore, based on the results of the regression analysis on research data, government policy in setting minimum wage standards has the greatest impact on residential property prices in the property sector in Indonesia. Thus, the results of this research are expected to provide the government with better viewpoints that will assist them in enacting better policies in the residential property sector.

Keyword: gross domestic product, wage, exchange rate, residential property price index

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INTRODUCTION

Indonesian property prices have continued to increase over the past decade as reflected in a Condensed Statements by Bank Indonesia concerning the increase in the Residential Property Price Index (RPPI). The continual increases in property prices have created fear among people that the 2008 property bubble in the United States as a result of excessive property loans will also occur in Indonesia. Thus, high economic growth and stable political conditions do not seem convincing enough for people to believe that there will be no crisis in the property sector in the upcoming years.

Indonesia is a country with the highest economic growth in Southeast Asia. Indonesia's population, according to the 2016 census by the Central Bureau of Statistics, is 260 million which places Indonesia as the fourth most populous country in the world. Among the islands where 34 Indonesian provinces are located, Java is the most populous island, even in the world, where more than half of the country's population lives. Jakarta, the Indonesian capital city, is also the most populous city in the country. The country shares land borders with the eastern part of Malaysia in the island of Borneo, the western part of New Guinea in the island of Papua, and the western part of Timor-Leste in the island of Timor. Major cities in Indonesia are Jakarta, Surabaya, Medan, Bandung, Semarang, Bogor, Depok, Tangerang, and Bekasi. Each city has a population of more than 1,500,000 people. Every year, population size continues to increase, resulting in increase in housing demand as well.

Conducting research on the increase in residential property price is really necessary. Continuous increase in residential property price will cause bigger portion of household expenditures to be focused on the purchase of the residential property which consequently reduces the portion for other needs. Furthermore, residential property is a primary need for human beings aside from food and clothing. Human beings will instinctively try to fulfil their primary needs before their secondary needs. Therefore, the residential property is deemed more important for human beings than commercial property or any other properties.

The government's policy, in fiscal and monetary field, is needed to ensure that the residential property price remains under control and is affordable for all levels of society. It is interesting to study which government policy is appropriate at the present time to control the residential property price. The government has the obligation to provide affordable residential property for all levels of society. Therefore, the government has to, without fail, control residential property price.

Researchers from various countries have studied the relation between residential property price and its determinants. According to Hong (2013), there is a dynamic relationship between economic growths, as reflected by the growth of Gross Domestic Product (GDP), with real estate demand. The increasing of GDP will increase people's purchasing power so it will also boost property demand.

Phyrr, Born and Webb (1990) studied the movements of price and demand on real estate. The results of these studies concluded that demand, supply and inflation strongly influence real estate price. The other results stated that the right time to buy and sell properties depends on the rate of return on the investment property. High inflation reduces the purchasing power of the general public including property investments.

Mahalik and Mallick (2011) analysed the dynamic relationship between residential property price with real incomes, stock price index, and real exchange rate, interest rate on non-food real and short-term real interest rate. The results of this research are that, in the long run, real incomes significantly affect residential property price with a positive direction; interest rate on non-food significantly affect residential property price with a negative direction. Variance Decomposition explains that the influence of shocks interest rate, on non-food, to the residential property price is the biggest outside itself, while the other variables are not significant.

Hofmann (2008) examined the relationship between bank lending, real interest rate and real GDP with real property price in 16 (sixteen) industrialized nations. The results of this study indicate that, in long-term, credit changes cannot affect credit demand. If property price shaped weighted average of the price of commercial and residential properties, the equation long term would show that bank lending to influence property price positively and significantly.

The existence of the phenomenon of the increase in residential property price in Indonesia is interesting to be studied. Previous researches have not specifically analysed the phenomenon. This study will analyse the determinants of residential property price in Indonesia. Variables that influence are GDP, interest rate, wage, inflation, and exchange rate to the US dollar. The relation between these factors is unlikely to be misleading. Therefore, the study uses error correction models (ECM) to analyse the influence of macroeconomic factors to residential property price. Results from this study are expected to give consideration to the government, as the policy maker in property sector, in controlling residential property price.

DATA DESCRIPTION

This study used secondary data for the period between 2002 Q1 and 2014 Q4. The quarterly data included RPPI, GDP, interest rate, wage and exchange rate to the US dollar. RPPI variables were taken from published reports of Bank Indonesia with the coverage survey of sixteen major cities in Indonesia consisting of Jakarta, Bogor, Tangerang, Depok, Bekasi and Banten provinces. RPPI in this paper was based on 2002=100. GDP was taken from the report publication of the Central Bureau of Statistics on a constant price basis 2000. The interest rate in this paper was based on the investment interest rate recorded by the Indonesian Institute of Sciences. Wages were the Real Wage Index (IUR) of industrial

workers under the foreman (supervisor) with IUR 2002 = 100, which was taken from the report published by the Central Bureau of Statistics. Inflation was the Consumer Price Index (CPI) at 2002 = 100 taken from the publication report of the Central Bureau of Statistics as well. While, the exchange rate data against the US dollar was taken from CEIC Data.

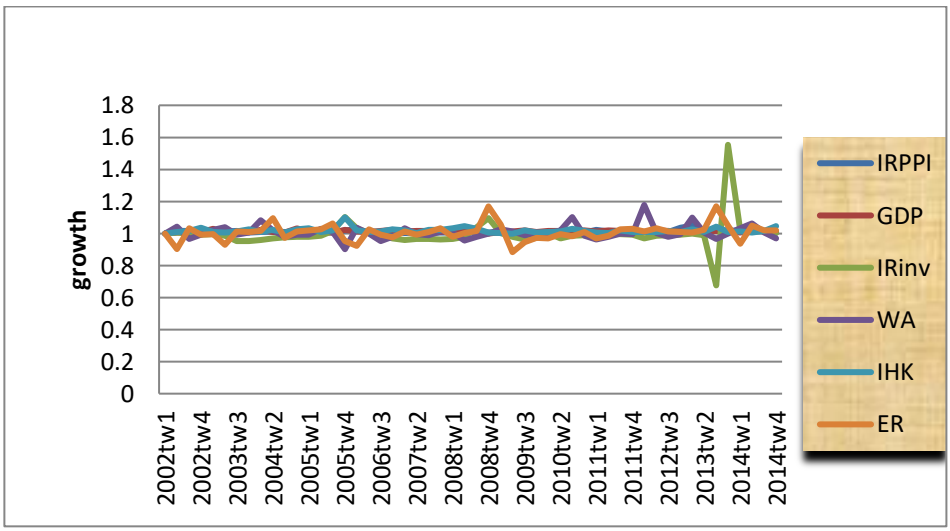

Figure 1: The graph of residential property price index with its determinant
Source: Bank of Indonesia

METHODOLOGY

The method used is error correction models (ECM) because the relationship of the variables has co-integrated. This is indicated by a linear combination of the series that is not stationary so there is a long-term equilibrium relationship between variables, while in the short term disequilibrium may occur. The differences on what to expect with what happened require an adjustment. Therefore we need a technique to correct the imparity towards the short-term to long-term balance by commencing adjustment. ECM was introduced by Sargan, further developed by Hendry and popularized by Engle - Granger. ECM is used to overcome the non-stationery time series data and spurious regression.

This method uses a unit root test, the level of integration test, and cointegration test. Unit root test procedures use Augmented Dickey Fuller (ADF) test, whereas the cointegration test uses the Engle-Granger procedure to see the long-term equation, while the short-term equation is estimated with error correction model (ECM).

This study developed a model that describes the influence of GDP, interest rate, wage, inflation, and exchange rate to the US dollar against

residential property price during the year period of 2002-2014. Mathematically the models used in this study are as follows:

$HP_t = f\,(GDP_t, IR_t, WA_t, I_t, ER_t)$
where:
HP_t = residential property price (index),
GDP_t = gross domestic product (Rp),
IR = interest rate (persentase)
WA_t = wage (index),
I = inflation (index), and
ER_t = exchange rate (Rp/US$),
t = quarter in-t, and

Based on the mathematical model above, an econometric model that aims to analyse the influence of independent variables on the dependent variable is formed. Dependent variable used in this paper was residential property price while the independent variables were GDP, interest rate, wage, inflation and exchange rate to the US dollar. Furthermore, based on the characteristics of time series data, the model is in the form of natural logarithm.

Imbalance correction coefficient is an absolute value that describes how long it is required to obtain the equilibrium value. If the value of the probability is smaller with the coefficient of 0.05 then the model is indicated to have a short-term relationship.

RESULTS AND DISCUSSION

Unit Root Test and Integration Test

As a condition of cointegration analysis, the first step carried was to test the unit root made for all the variables (LNHP, LNGDP, LNIR, LNWA, LNI, LNER) using Augmented Dickey - Fuller test (ADF). Stationary state occurs if the variable in question has an absolute value of Statistic Augmented Dickey Fuller (ADF - Test) that was greater than the critical value (McKinnon Critical Value) at the significance level of 1%, 5 %, and 10 %.

Based on unit root test results, it can be seen that non-fulfilment of assumptions are stationary at zero degrees or I [0]. Therefore, it is called stationary at first difference if the value of ADF count > Mackinnon Critical Value. The next test was the degree of integration. This test was a continuation of the unit root test. This test differentiates variables to a certain degree so that the variables are stationary at the same degree.

The result of the degree of integration test showed that variables pass the test of the degree of integration of I. However, the test results showed that the

variables are not stationary at the current level but stationary at 1st difference level with a level of significance of 1%, 5% and 10 %.

Engle-Granger Cointegration Test

Cointegration test is used to test whether there is a long-term relationship between residential property price to GDP, interest rate, wage, inflation, and exchange rate to the US dollar. If the variables that are not stationary become cointegrated then the linear combination between variables in the system will be stationary so that the equation will be stable long term. This study uses Engle-Granger cointegration test.

Cointegration test results based on Engle-Granger procedure that is unit root test against the residuals of the equation, we reject H_0 stating that the residuals are not stationary. It can be seen from the t-statistic Augmented Dickey Fuller (ADF) which is greater than the Mackinnon critical value of his good at significance level $\alpha = 5$ % and $\alpha = 10$ %. It means that in the long-term, equation cointegratied at significance level $\alpha = 5$ % and $\alpha = 10$ %.

Estimation and Analysis Long-Term and Short Term Equation

Based on test results obtained, it is positive that in the long-term, equation cointegrated. The model that explains the relationship between residential property price and its determinant variables is as follows:

$$LNHP_t = -3.3312 + 0.2431 * LNGDP_t + 0.04551 * LNIR_t + 0.3361 * LNWA_t + 0.2904 * LNI_t + 0.1229 * LNER_t$$

Where t-stat:

LNGDP	= 1,7561
LNIR	= 1,3876
LNWA	= 5,9817
LNI	= 2,8999
LNER	= 3,2848

LNGDP coefficient is positive. It means that in the long term, the relationship between GDP with residential property price is in the same direction. LNGDP coefficient value of 0.2431 indicates that a 1 percent increase LNGDP, ceteris paribus, in the long run, will raise residential property price up to0.2431 percent. Absolute value (coefficient LNGDP < 1) indicates that in the long-term LNGDP is inelastic on residential property price. People's purchasing power is a factor determining the level of public demand including demand in the residential property sector. This has an impact on the increase in residential property price. According to Gallin (2003), the income level, in the long-term, has a positive effect on residential property price.

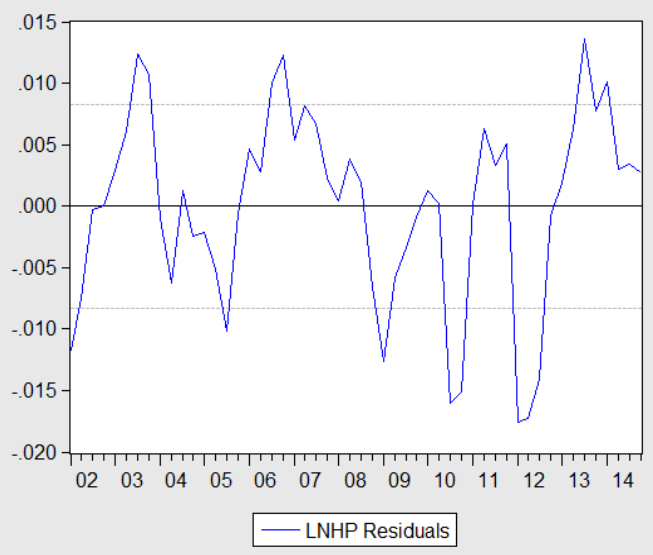

Figure 2: LNHP Residual Graph in the long-term

After knowing how the models of residential property price in the long term are, the next step we are making the short-term equation estimation. It was explained earlier that if variables mutually cointegrate, the dynamic model that is used to seek short-term balance is ECM.

Results of regression equations on residential property price in the short-term by using the approach of error correction model (ECM) is as follows:

D(LNHP) = 0.0045 - 0.0679*D(LNGDP) + 0.0051*D(LNIR) + 0.0491*D(LNWA) + 0.0868*D(LNI) + 0.0094*D(LNER) - 0.1279*RESID01(-1) ... (7)

Where t-stat:

LNGDP	= -0,3222
LNIR	= 0,3712
LNWA	= 1,4630
LNI	= 0,9968
LNER	= 0,3728

LNGDP coefficient is negative; the result is a negative short-term relationship between GDP with residential property price. LNGDP coefficient value of -0.0679 showed that an increase of 1 percent change in GDP, ceteris paribus, in the short term will lower the residential property price by 0.0679 percent. Absolute value of LNGDP coefficient showed that the relationship between GDP with residential property price in the short term is inelastic.

LNIR coefficient is positive; the result is a positive short-term relationship between interest rate with residential property price. LNIR coefficient value of 0.0051 indicates that an increase of 1 percent change in interest rate, ceteris paribus, in the short-term would raise residential property price 0.0051 percent. Absolute value of LNIR coefficient showed that the relationship between interest rate with residential property price in the short term is inelastic. The same meaning with LNWA, LNI and LNER.

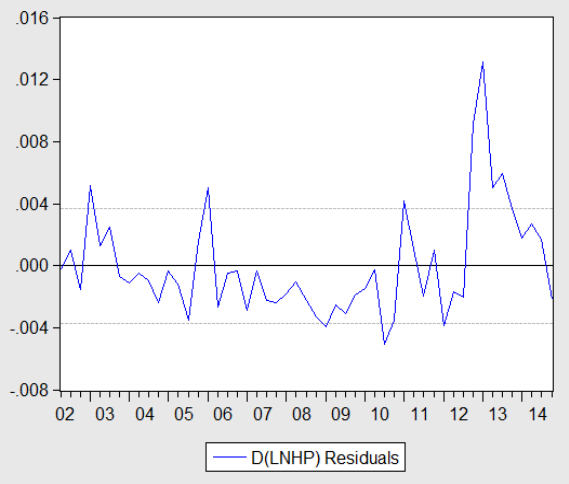

Figure 3: LNHP Residual Graph in the short-term

Variables Error Correction Term (ECT) shows the speed of adjustment which means how fast is it to correct the imbalance from the previous period to the current period. ECT value of $_{t-1}$-0.1279 means that the disequilibrium residential property price in the previous period is corrected 12.79 % in the current period. In other words, the speed of adjustment to correct an imbalance of residential property price model for short-term model towards equilibrium model of residential property price in the long term is 12.79 %. The negative sign on the ECT means that any deviation from the long-term balance will be corrected where the effect on residential property price will be going towards equilibrium point in the long run because the system is stable.

The estimation results show that in the short-term, determinant variable was not shown to have a significant effect on residential property price. According to Mahalik and Mallick (2011), GDP change was not able to influence residential property price because the investment in the property sector are long-term. Residential property price can be influenced by changes in GDP if the change is permanent. Permanent change on determinant variables is needed to have significant impact on residential property price. It takes quite a while to build residential property; on the other hand the house selling price has been

calculated and set previously. In other words when the construction of the housing is still undergoing, the price of materials and wage standard can rise unexpectedly and cause more expenses than what is already been calculated.

Evaluation Models

Results of model cointegration estimation indicate the value ofR^2 0.9864 and the value is adjusted by 0.9849. The value of R^2 shows that variations in residential property price can be explained as much as 98.64 percent by the model; the rest is explained by variables outside the model.

The next is testing the significance of the effect of all explanatory variables to the dependent variable. Hypotheses test F are as follows:

H_o: $\beta_0 = \beta_1 = ... = \beta_k = 0$

H_0: $\beta_0 = \beta_1 = ... = \beta_k \neq 0$

The estimation results of the model of cointegration yielded a calculated F value of 668.0695 with probability 0.0000 while the value of F table is F (5%, 5.46) is 2.4173 which means that the value of Fcount>F table and probability of 0%<5% so that Ho refused. This means that the overall explanatory variables in the model have a significant effect on residential property price

This study tested the level of significance of independent variables on the dependent variables individually as well as the direction of influence. To determine the significance t-test is used t-test and compared with t-table value at 95% confidence level.

T-table value at a significance level is α: 5% = 2.0128; α: 1% = 1.6786; α: 10% = 2.6870. Thus in the long run, variables LNWA, LNI and LNER are significant at a significance level α = 1%; 5% and 10%; LNGDP variables are significant at a significance level α = 1%, LNIR variables do not have significant effects on residential property price. In the short term all independent variables do not significantly affect the price of the residential property.

The estimation results of equations of residential property price in short term is R^2 value 0.09364 or at 9.36%. This, due in the short term, is very possible variation of the dependent variables were influenced by noneconomic factors such as socio-political situation, security and government policy. The factor that causes the dependent variables do not respond to the change is the change of the independent variable which is not permanent.

ECM estimation results indicate that the F count equal to 0.7576 is smaller than F table (2.4173), so it can be concluded that, in the short run, jointly independent variables cannot explain the dependent variable.

Implication to Property Policy

The rapid increase in residential property prices may threaten the stability of the national economy. The increase can occur due to several factors such as GDP,

Interest rate, wage, inflation, and exchange rate to the US dollar. Therefore, to stabilize the residential property prices, the most important thing to have is full-control of the factors that affect the increase in residential property prices including the occurrence of speculative bubble in the long term.

The government and Bank Indonesia as policy makers in their respective field of fiscal and monetary policy must optimize all available instruments to control residential property price. The policies that must be issued are:

(a) Small residential property subsidy mechanism. The movement of residential property price is not in spite of the increase in GDP, from another point of view the increase in GDP is positive, which means increasing the prosperity of society. This becomes a problem when the increase in the purchasing power is lower than the rise in residential property price, so that for people, especially among the middle and lower class, it is difficult to buy a house. In this regard, the government needs to implement a subsidy mechanism for small-sized residential property so that people manage to afford housing according to their purchasing power. Furthermore, the government can issue a policy to provide the amenity facility of mortgages for low-income people.

(b) Reduction of interest rate for credit investment. The rate of credit interest for high-rated investment causes investors, in this case the developer in the property sectors, find difficulties in obtaining capitals to invest in housing construction. This resulted in the supply of housing on the property market has yet to fully meet the demand. Therefore, the government needs to control the investment credit interest rate so that it is affordable and enable the investors to meet its obligation to return their bank loan.

(c) Wage policy. The result of the study indicates that the regression of the positive wage factor carries a significant impact on residential property price; similar indication is also found with GDP factor. High wage causes the cost of residential property construction to increase so significantly that housing price also rises. In the other hand, high wage demanded by the labour unions will make the investment climate in property field unattractive to the investors. Investors will move out other countries looking for more profitable investment. Therefore, the government needs to issue the right policy that facilitate the both sides; the investors and the workers so that friendly investment and also the welfare of workers can be both achieved

(d) Inflation control. As long as it is kept at certain limit, Inflation is essential since it indicates that the economy is growing due to the price of goods / services that rises spurring economic productivity. But when inflation gets so high that the price of goods / services rises beyond people's purchasing power, it will be able to trigger economic crisis. Therefore, the government needs to control inflation through raising interest rate on deposits; providing economic stimulus / liquidity assistance to property developers; reducing government spending; reducing the circulation of money in the community

by selling government securities, and increasing the purchasing power of the society.

(e) Controlling exchange rate to the US dollar. In the era of globalization it cannot be denied that trade between countries is a common practice even with greater volume. Most residential construction materials are also obtained through imports. Therefore, the increase in the exchange rate to the US dollar causes the rising in residential property price. Bank Indonesia (BI) needs to take measures to control the exchange rate to the U.S dollar including the supervision of the fairness of foreign currency transactions, monitoring of the restrictions on rupiah transactions of non-residents, moral suasion, sterilization / intervention in foreign exchange and Open Market Operations (OMO) against excess on rupiah liquidity.

The study is limited only on the analysis of the data taken in the period of 13 years. A study covering data from longer time period may help to provide better results, and if we are to include other variables such as population, demand and supply of property, the results may be more accurate.

CONCLUSION

The results of the research on the influence of GDP, interest rate, wage, inflation, and exchange rate to the US dollar on residential property prices in Indonesia with study period data in the first quarter of 2002 until the fourth quarter of 2014 can be summarized as follows:

a) In the long term, the study results show that factors of GDP, wage, inflation, and exchange rate to US the dollar have significant impact to the residential property prices, while investment interest rate does not.
b) In the short term, determinant variables have no effect on residential property prices in Indonesia. It is possible that the permanent changes needed in the independent variable are required to determine the effect on the price of residential property.
c) The relation between the variables studied has important implications for policy-making in the property sector. The government as a fiscal authority as well as Bank Indonesia as the monetary authority can take steps to control residential property price through the instruments provided. Therefore, these policies include:
    i. The small residential property subsidy mechanism.
    ii. Reduction of interest rate for credit investment.
    iii. Policy in setting wage standards.
    iv. Inflation control.
    v. Exchange rate control.

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NOTES TO CONTRIBUTORS AND GUIDELINES FOR MANUSCRIPT SUBMISSION

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