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Mitigating housing glut: an application to the Malaysian housing market

Mitigating
housing glut

Chee Yin Yip, Abdelhak Senadjki and Hui Nee Au Yong
*Faculty of Business and Finance, Universiti Tunku Abdul Rahman,
Kampar, Malaysia, and*

Azira Abdul Adzis
*School of Economics, Finance and Banking,
Universiti Utara Malaysia, Sintok, Malaysia*

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Abstract

Purpose – This paper aims to construct a model procedure to mitigate housing glut by using both qualitative and quantitative approach. The model applied in the Malaysian context analyzes the following: information contained in media articles and reports issued by Bank Negara Malaysia (BNM) on the housing market to extract the true picture of the housing glut issue; the relative impact (effectiveness) of housing affordability, housing prices and economic growth in influencing housing glut, and how it can be overcome so that appropriate preferential policies can be taken to mitigate the problem.

Design/methodology/approach – This study uses quarterly data from 2000 to 2017 to conduct economic analysis, economic theory analysis and cointegrating regression, whereas information from media-published housing articles and reports issued by BNM are examined and interpreted to draw the true picture of housing glut.

Findings – The results obtained from quantitative analysis show that housing affordability exerts very mild relative effect (0.0097) negatively on housing glut, whereas economic growth and housing price produce a relatively mild positive impact of (0.020) and (0.022), respectively, conflicting to the common consensus that the two factors have a significant effect on housing glut. Qualitatively, the results of this study show that housing glut seems to be relatively larger for affordable housing, which is contrary to the quantitative results, pointing to the existence of other influencing factors.

Research limitations/implications – There is an imperative need for a third-party survey to gain a comprehensive understanding of the market conditions and buyers' sentiment and preference.

Originality/value – This study compares both quantitative and qualitative results with expected housing market movements and responses based on conventional wisdom.

Keywords Affordability, Imbalance, Supply, Demand, Mitigate, Housing glut

Paper type Research paper

1. Introduction

The now well-known subprime meltdown started in 2007 in the USA has resulted in the collapse of the housing bubble which contributed to one of the most severe recessions in decades. The global financial crisis stemming from the recession and gripping the world for the next almost two years was customarily preceded by an economic bubble burst,



JEL classification – A13, C26, F43

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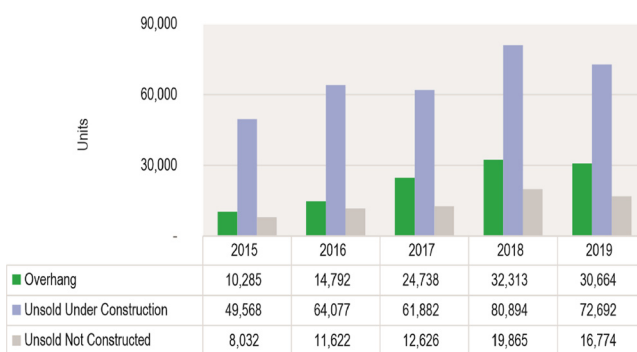
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this time the housing market bubble (Reinhart and Rogoff, 2008). It is well known that one of the main causes for the crash of the housing boom is rising housing glut. The increasing number of unsold houses can cause serious damage to the general economy. Among the scenario would be the slowing down of the construction industry and a sizable number of related industries. This will result in financial institutions tightening their lending criteria and consequently leading to a credit crunch in the housing market which will further reduce housing sales. Invariably, house prices will fall, eroding investors and house-owners' wealth and hence consumer spending (Reinhart and Rogoff, 2011; Cheah and Almeida, 2017).

Housing glut stems from oversupply and falling response from buyers. Poor sales will reduce developers' capacity to service their bridging loans and potentially increases the likelihood of abandonment of ongoing development projects. Poor sales will usually prompt reduction in prices which in a glut scenario will induce buyers' expectation of further price fall and thus hold back to purchase later. From financial institutions' perspectives, when the economy, and particularly the housing industry, is hurting, lenders will take a more cautious stance in approving loans resulting in the tightening of consumer credit. All these will further exacerbate the drop in housing demand. This may lead to a severe consequence on the housing prices and it may develop into a housing bubble that unavoidably leads to the collapse of the financial system (Yip *et al.*, 2016; Yiu *et al.*, 2013; Virtanen *et al.*, 2018). The question is: Is Malaysia facing severe housing glut that warrants an in-depth study to avoid a possible severe slowdown of housing market. We start off by examining the recent statistic of housing glut to extract some hidden indications so as to validate our study. Figures 1–3, respectively, show a comparative bar chart, single bar chart and line graph illustrating the severity of housing glut in Malaysia. It features the statistics of overhang, units under constructions and units not yet constructed.

Figure 1 indicates that residential units, whether constructed, under construction and not constructed, increased dramatically from 2015 to 2018 (year-on-year increase is 44%, 67%, 31%) and then decreased about 5% from 2018 to 2019. Thus, the year-on-year increase of oversupply from 2015 to 2019 is alarming. Figures 2 and 3, using bar chart and line graph, reinforce the scenario as features in Figure 1, showing the number of unsold housing units especially residential unit, constantly increasing rapidly from 2014 to 2018. The fact that number of unsold houses in just one quarter, 2018Q1, is more than the whole year of 2017 suggests the seriousness of the housing glut problem. If projects which are still in the pipeline are to be included in the calculation, the housing glut scenario is expected to get very much worse. This alarming worsening trend needs to be addressed so as to avoid

Figure 1.
Statistics of housing
glut from 2015 to
2019



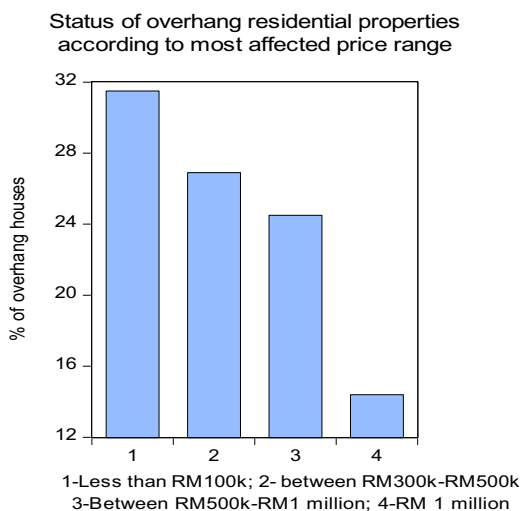


Figure 2. Number of overhangs according to price range from 2014 to 2018

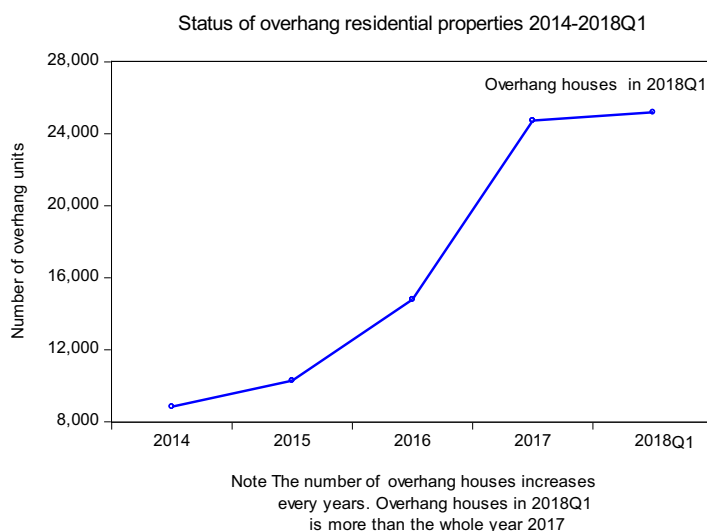


Figure 3. Number of overhang houses according to price range number of units unsold for the period 2014-2018

Source: National Property Information Centre Malaysia

situation where the housing market would deteriorate into a housing bubble leading to financial crisis (Escobari and Jafarnejad, 2016).

In view of the devastating consequences of housing glut, it is therefore pertinent and imperative to investigate housing glut dynamics. This paper aims to investigate the relative impact of the main determinants of housing glut after using qualitative analysis to analyze and explain the observed market dynamics and certain deviations from statistical results.

With insight into these aspects, we hope to formulate an approach to alleviate the housing glut issue.

2. Theory and hypothesis development

Housing glut is basically caused by the fact that supply and demand are not matching with each other. However, demand side is not so straightforward. For example, a consumer can afford only a certain lower level of housing, but through a certain financial packaging, he can afford a higher level of housing. Thus, in this case, demand side is not totally depending on market forces. We classify this as because of social economic status consciousness. In this section, we present the general theoretical model of housing glut, economic theory of supply and demand and an analysis of the impact caused by social economic status consciousness characteristics of the house buyers.

2.1 General model

By logical deduction, it is recognized that housing glut is equal to the difference between supply and demand. Based on conventional wisdom, we make the assumption that the three determinants, namely, housing affordability, housing price and economic growth are variables for both supply and demand function. Equations (1)-(4) show the model, where HG = housing glut, S = housing supply, D = housing demand, g = economic growth, P = housing price, a = housing affordability and o = other factors which are assumed to be constant in this study.

$$HG = S(g, p, a, o) - D(g, p, a, o) \quad (1)$$

Assuming all other factors denoted by o to be constant, we have the following relationships:

$$d(HG) = \left(\frac{\partial S}{\partial g} - \frac{\partial D}{\partial g} \right) dg + \left(\frac{\partial S}{\partial p} - \frac{\partial D}{\partial p} \right) dp + \left(\frac{\partial S}{\partial a} - \frac{\partial D}{\partial a} \right) da \quad (2)$$

For equilibrium condition where demand equal to supply, which in turn implies that there is no housing glut, we have

$$\left(\frac{\partial S}{\partial g} - \frac{\partial D}{\partial g} \right) = 0, \quad \left(\frac{\partial S}{\partial p} - \frac{\partial D}{\partial p} \right) = 0, \quad \left(\frac{\partial S}{\partial a} - \frac{\partial D}{\partial a} \right) = 0 \quad (3)$$

For housing glut or housing surplus, we have the following relationship:

$$\frac{\partial S}{\partial g} > \frac{\partial D}{\partial g}, \quad \frac{\partial S}{\partial p} > \frac{\partial D}{\partial p}, \quad \frac{\partial S}{\partial a} > \frac{\partial D}{\partial a} \quad (4)$$

Under housing glut condition, we would have the derivative of the supply function, S , with respect to economic growth, g , much larger than the derivative of the demand function, D , with respect to economic growth. The same condition applies to housing price, p , and housing affordability, a . Qualitatively, when increase in supply with respect to increase in economic growth is more than increase in demand with respect to increase in economic growth, then housing glut will happen and its magnitude depends largely on how big is the gap between supply and demand, provided the rate of change of all the other variables remains constant. The situation is the same for housing price and housing affordability.

Thus, to have zero housing glut which is the ideal equilibrium condition, we should have the derivative of supply function equal to the derivative of demand function, both with respect to economic growth, housing price and housing affordability. To back up this model formulation, we analyze the demand and supply function curves.

2.2 Economic theory of demand and supply

Excessive housing vacancies is basically because of the difference between demand and supply, and that the nature of its data should be random and deterministic by conventional wisdom and thus should consist of a combination of qualitative and quantitative characteristics. Hence, it should be best analyzed using qualitative and quantitative techniques.

2.3 Demand and supply function curves

Housing glut can only occur when supply is more than demand. When supply is equal to demand, we have the equilibrium condition denoted by D in which case there is no housing surplus or housing glut.

$$\text{Supply} = \text{Demand} = D.$$

However, when housing price increases from the equilibrium position, demand will decrease and, as a result, the demand curve D in Figure 3 shifts to the left, and thereafter denoted by D_1 from the equilibrium point resulting in a housing surplus represented by $G_1 = S_1 - d_1$. Nevertheless, when housing affordability increases, the demand curve D will shift to the right becoming D_2 and producing small shortage $G_2 = d_2 - S_2$. Figure 3 suggests that $G_1 > G_2$.

Figure 4 also shows that the demand curve shifts to the right at a large amount as caused by economic growth increases and this produces housing shortage $G_3 = d_3 - S_3$. Therefore, the final result is housing affordability and economic growth are each negatively correlated to housing glut, whereas housing price influences housing glut positively. We are going to conduct our study based on the above model, and supply and demand curves theory. Our

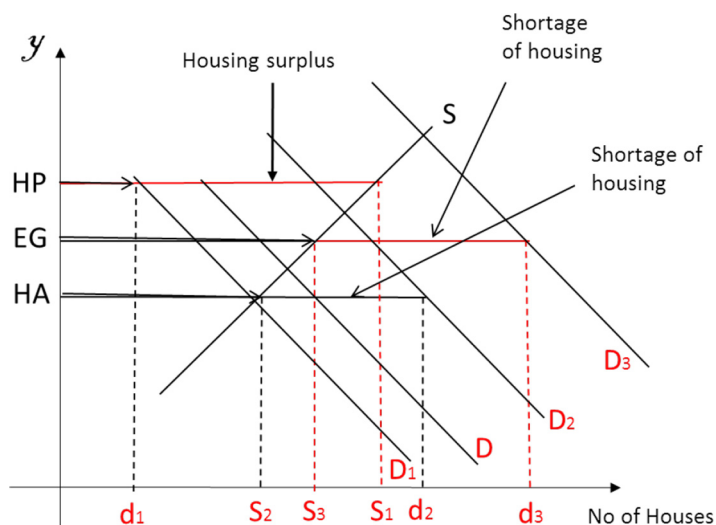


Figure 4.
Demand and supply curves for HP, EG and HA

preliminary investigation will be on the qualitative and quantitative characteristics of housing glut.

2.4 Qualitative characteristics

Recently, many non-academic researchers published their opinion and findings about housing glut (New Straits Times, 2017). They contend that the primary cause of housing glut is the rapid rise of housing prices within a period of a couple of years, reducing significantly the number of people who can afford to buy houses. Another common proposition blames developers' unwillingness to construct more affordable houses (BNM, 2017). In addition, there is also a common belief that economic growth is directly correlated to housing. With respect to housing price, there are also many who believe that high housing price is the main cause or one of the primary causes of housing glut (Star Property.Com, 2017). There is general consensus on the influence of these factors on housing glut but to what extent or the degree of impact each has on housing glut? An insightful knowledge on this aspect will offer a good guide to the degree of emphasis to be accorded to each factor to achieve more effective outcome in managing the issue of housing glut. So far investigation from this perspective seemed to have been overlooked.

The reason we emphasize on the aforementioned three factors, namely, rapid increase of housing prices, insufficient supply of affordable houses and economic growth, is basically that they have discernible correlation with housing glut. Apart from these three factors which we are going to investigate quantitatively, we cannot deny that there is a human factor indirectly influencing housing glut. This human factor is termed as social economic status consciousness which refers to status consciousness influenced by environment. This social economic status consciousness is considered to have great influence on connectivity and locality of housing projects, and house buyers' preference which include buying houses more expensive than they can afford. In this study, we assume that all the four human factors are almost constant throughout. And based on the non-academic findings and the analysis of Figures 1–4, we can draw conclusion that there is a lack of coordination among the stakeholders in balancing the supply and demand of housing. Such mismatch reflects a lack of up-to-date and accurate market information on the part of the supply planners. And facts on the ground with regard to market condition and sentiment could and should be collected by means of regular comprehensive market surveys, including accessing potential buyers' opinion, by disinterested third party. The importance of availability and access to comprehensive market data in balancing the supply and demand for housing was highlighted by Dao Harrison, the senior housing specialist of World Bank during World Urban Forum 9 (The Star, 2018).

Our foregoing conclusion is corroborated by recent media articles which reported that the main contributor to housing glut is the lack of coordination among market players (BNM Quarterly Bulletin, Third Quarterly 2017). This contention of lack of coordination will remain to be true irrespective of whether we can verify that the common belief that housing affordability, housing price and economic growth are the major causes of housing glut to be otherwise. Literature to-date on the relative importance of each of the factors affecting housing glut is scarce. This relative impact factor is effectively very useful in designing and implementing policy to mitigate using glut so as to alleviate the damaging effects of housing glut as government resources are limited and priority on which factor should be addressed first could have profound implication on the success of overcoming housing glut problem.

But so far to our knowledge, there are only few if not none at all of this type of research in the aforementioned literature as described in the introduction. The reason could be that it is seemingly unsubstantiated that coefficient of regression can be used as a measure of impact

on the dependent variable (housing glut). To overcome this problem, we analyze the relative impact by constructing three simple models estimated by cointegrating regression method as we expect each of the determinants mentioned is an I(1) integrated variable which we have verified, and that we are interested in long-run impact and not short-run impact.

2.5 Quantitative characteristics

The above conceived ideas which are published in media articles (The News Straits Times, 2017; [The Star, 2018](#)) are propounded by many industry professionals and also the public in general. However, in the academic world, very few researchers are in total agreement with them. The reason could be these conceived ideas are obtained by observing what is happening on the ground, which are appropriately verified by descriptive statistical analysis only. Moreover, it is difficult to obtain an appreciable data set which is large enough to conduct a meaningful quantitative analysis. As such, in our study, we strike a balance of what is observed on the ground and our statistical analysis. As for academic research, many studies have been conducted on the causes of housing affordability issue only and have offered various methods and policies to curb the problem ([Angel et al., 1993](#); [Angel, 2000](#); [Paris, 2007](#); [Gabriel et al., 2005](#); [Baqtayan, 2016](#)).

However, as far as we know, no studies have been carried out to investigate the direct link between housing affordability and housing glut, and their associations with key factors such as housing price and economic growth to obtain a clearer picture of the housing glut dynamics and therefore provide efficient and effective policies to minimize and/or eradicate the problem of housing affordability as well as housing glut problem. As for the development of literature in the Malaysian context, we have [Rameli and Aman \(2011\)](#), [Bunos \(2006\)](#) and [Osman et al. \(2017\)](#) which work on the causes on housing glut but based mainly on a qualitative approach without investigating the relative impact of its determinants. Thus, it seems that in-depth investigation on the problem of housing glut has been overlooked. In view of the potential damaging effect of the issue, we propose to bridge this gap by using a more comprehensive approach involving economic analysis, economic theory and statistical modelling.

In broader perspective, this study therefore aims to analyze the nexus between housing glut, housing affordability, housing price and economic growth using economic theory, conventional wisdom and economic analysis with the objective of determining how each one of the determinants impact housing glut. And then we apply statistical modelling to analyze the effectiveness of these factors on their ability to lower housing glut.

The rest of the paper is organized as follows. Section 3 provides review of previous literature. Section 4 presents qualitative research method whereby an economic and logical analysis is conducted on each of the factors influencing housing glut and then followed by quantitative method using cointegrating regression which is suitable to measure long-run effect. Section 5 presents empirical analysis and conclusion for this paper.

3. Literature review

Academic research on housing glut is relatively understudied as existing studies focus more on housing affordability ([Gabriel et al., 2005](#); [Paris, 2007](#); [Borrowman et al., 2017](#); [Okkola and Brunelle, 2018](#); [Lens, 2018](#); [Owusu-Manu et al., 2018](#); [Öztürk et al., 2018](#); [Yap and Ng, 2018](#); [Olanrewaju and Wong, 2020](#)), and another strand of studies focusing on housing supply (see for example, [Mayo and Sheppard, 1996](#); [Malpezzi and Mayo, 1997](#); [Blackley, 1999](#); [Tse et al., 1999](#); [Malpezzi and Maclennan, 2001](#); [Mayo and Sheppard, 2001](#); [Harter-Dreiman, 2004](#); [Ball et al., 2010](#); [Caldera and Johansson, 2013](#)). However, most of these literature on housing glut is conducted in the USA ([Mcnulty, 2009](#)) and Germany ([Großmann et al., 2015](#)). Thus far,

empirical study on housing glut in Malaysia is fairly scarce. However, there are a couple of Malaysian journal papers closely related to our study. We analyze these papers in detail to back up our aims for this paper.

A review of the literature on the issues of housing affordability and housing glut in Malaysia reveals a general consensus whereby among the causes of residential property overhang are weaknesses in the local authority's planning practices (Rameli and Aman, 2011), housing prices are too high (Lee, 2014), insufficient affordable houses being built (Osman *et al.*, 2017), home buyers' preference in conjunction with their affordable house price (Soon and Tan, 2019) and long-run housing unaffordability (Rangel *et al.*, 2019). The followings are reviews of the above relevant papers in perspective.

According to Lee (2014), housing price is among the factors that may contribute to residential property overhang in Malaysia and it is indeed a very complex issue. Soon and Tan (2019) address the issue of property overhang in Malaysia by associating it to the home buyers' preference in conjunction with their affordable house price and types of house in relation to their household income. Their finding shows that the monthly income is inadequate for the people to purchase their preferred house with the housing price in the current market. For example, the low-income households with income between RM900 and RM2,000 perceived the affordable housing is condominiums; however, the affordable range is not aligned with the mean housing price.

However, Rangel *et al.* (2019) emphasize that Malaysia is plagued with increasing long-run housing unaffordability. The increase in residential overhang can be attributed to the oversupply of the medium- and high-priced housing which are beyond the affordability of most Malaysian households. As a matter of fact, the maximum affordable house price in Malaysia is estimated to be RM282,000. However, actual median house price is RM313,000, whereas the median national household income is only RM5,228 (Ling *et al.*, 2017).

In relation to this, affordable housing is broadly defined as housing which is adequate in quality and location, and is not so costly that it prevents its occupants from meeting other basic living needs (UN-HABITAT, 2011). There are numerous studies that have investigated housing affordability (see, for example, Gabriel *et al.*, 2005; Paris, 2007; Hashim, 2010; Borrowman *et al.*, 2017; Okkola and Brunelle, 2018; Lens, 2018; Owusu-Manu *et al.*, 2018; Öztürk *et al.* 2018; Yap and Ng, 2018; Olanrewaju and Wong, 2020). However, the existing researches ignore an important aspect triggered by housing price, housing affordability and economic growth and this aspect is housing glut and its significant effect on the housing market.

Moreover, governments in countries around the world have explored ways and means of using statutory land-use planning system to implement the provision for additional affordable housing more effectively (Paris, 2007; Ben-Shahar and Warszawski, 2016; Gabriel *et al.*, 2005; Burke *et al.*, 2007; Yates *et al.*, 2004; Beer *et al.*, 2007; Osman *et al.*, 2017). Nevertheless, these studies focus mainly on providing policies on how to increase the affordability to purchase houses but miss out the fact that when supply is more than demand, unsold houses will increase and this will give pressure to the house price. In this respect, the problem of affordability would diminish but it may result in a more severe problem which is housing glut and, eventually, housing bubble.

The existing studies on housing mainly suggest methods to solve housing affordability and housing price issues but very little examine the relationship between housing affordability, housing prices, economic growth and housing glut. Additionally, to the best of the authors' knowledge, none of the existing studies investigate the relationship between housing affordability and housing glut, and their correlation with other factors such as housing price and economic growth to obtain a clearer picture of the housing affordability

dynamics so that correct remedial policy action can be taken to alleviate housing affordability problem and thereby alleviate the housing glut problem.

From the qualitative analysis in Section 2 and literature review in Section 3, we can conclude that two of the determinants of housing glut are housing price and housing affordability. As economic growth is highly correlated to housing price and housing affordability, we also conclude that economic growth is one of the main determinants for housing glut. Additionally, these three determinants can be investigated using quantitative methods. However, we also understand that local authority's planning practices and homebuyers' preference which are closely related to social economic status consciousness are also contributing to the worsening of housing glut as well. For these last three factors, we analyze their effect on housing glut using qualitative techniques (descriptive statistics). The reason is that it is difficult to find suitable proxy data to represent them in any quantitative analysis.

Apart from these three main determinants and three qualitative factors, there are other macro factors such as connectivity and locality of the housing projects, interest rate and exchange rate which are also at play. However, we will not include the last two factors in this paper because from our literature review, we have detected little, or none at all, connection between housing glut and all these other macro factors. Nevertheless, connectivity and locality are two factors which many housing industry observers have claimed to have significant impact on housing take-up and thus housing glut. These two are logical factors, particularly from the buyers' practical point of view. We classify these two factors as human factors under local authority's planning.

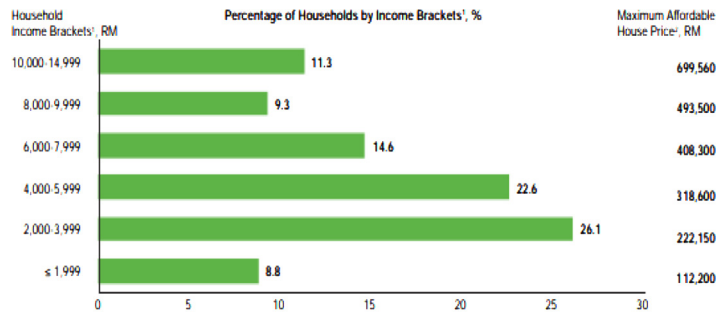
4. Research method

This study implements logical deduction, and conventional wisdom combined with economic analysis, to examine qualitatively housing glut dynamics and also between macroeconomics variables in housing market, namely, housing glut, housing affordability, housing price and economic growth. The reason we use these four macro variables is that they are interrelated to one another in some way. Most important of all, qualitative analysis in Section 2 and literature review in Section 3 suggest that these four macroeconomic variables are strongly related to each other. We expect the result of the analysis in Sections 2 and 3 will enable us to devise steps to mitigate housing glut and also guide us to conduct statistical modelling correctly and thereby ensuring the regression results significant. To make our result more robust and consistent, we use long-run cointegrating regression for our analysis because we need long-run impact of the major determinants on housing glut only.

4.1 Qualitative method

4.1.1 Housing glut. It is believed that there is a severe housing glut in Malaysia because of the increasing of the overhang units (BNM, 2017). The breakdown of the unsold units shows 68.5% are priced above RM300,000 per unit and 31.5% below RM100,000. Of the unsold property, 40.6% comprise high-rise apartments (see Figure 2). From an analysis of these figures against a backdrop of rising complaints from the public of high prices and shortage of affordable homes, the following logical deductions can be drawn.

First, we adopt the definition of affordability which states that a household can only afford a home priced not more than three times its annual income. Therefore, a property priced RM300,000 is attainable by households of monthly income of at least approximately RM8,000, and from Figure 5, this level can be considered in the RM6,000-RM7,999 range (14.6% of households) and the RM8,000-RM9,999 range (9.3% of households). Similarly, for



Notes: 1. Based on the Household Income and Basic Amenities Survey Report 2016. Households earning RM15,000 and above account for 7.1 per cent of total Malaysian households; 2. Estimates of maximum affordable house price is derived based on the upper-end of each income bracket, using the Housing Cost Burden Approach, in which a house is deemed affordable if the monthly housing repayment cost do not exceed 30 per cent of household income. Estimates are based on prevailing interest rates and 35 year mortgage tenure

Source: Department of Statistics, Malaysia and Bank Negara Malaysia estimates

Figure 5.
Housing affordability
by income levels

the below RM100,000 houses, such price range is within the affordability of about 35% of households. Taking into consideration the reported strong demand for housing amidst the similarly severe complaints on shortage, the high housing vacancies scenario reflects the influence of the following contributing factors to the issue of housing glut in Malaysia.

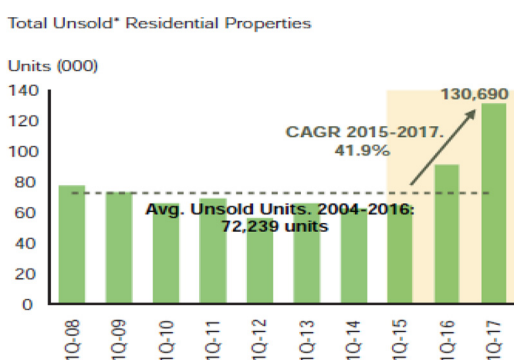
Prices stated are median or average prices. Therefore, it could be in reality, prices are still too high for many households, especially those whose income is on the lower side of the income range. The location of the property is a critical criterion in the choice of a home. The availability of public and lifestyle amenities such as schools, hospitals, public parks and shopping malls are often necessary complements for a livable and meaningful place for a home. Connectivity and accessibility are important aspects of consideration by homebuyers, especially in terms of transport to and fro between place of work/business and the residential location. The practicality and appeal of the design of the house as well as the aesthetic and security aspects of the environment of the neighborhood will affect the sales of the houses in a development project. All these are factors which will affect the needs and preference of the homebuyers as well as the investors and thus their buying decision. And to be able to incorporate such aspects of consumer needs and preference into the properties to be developed, developers would need current market information which, obviously the best channel, would be through regular comprehensive market survey.

The foregoing logical analysis of the causes of poor homebuyers' response resulting in housing glut in Malaysia provides convincing support for our argument that the lack of coordination particularly among stakeholders on the supply side in launching housing projects and the insensitivity of some developers towards the needs and preferences of the potential homebuyers and investors are the main contributors to the current housing glut situation.

Apart from the above, other factors reported as potential contributors to housing glut are macro factors which include growth in number of houses that has out-paced population

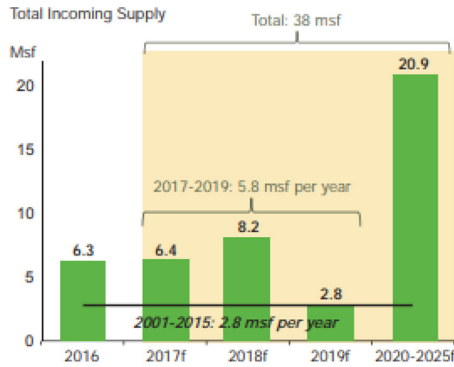
change, shrinking household size, increase in housing loans surpassing that of household income and the substantial rise in household debts. Figure 6 revealed that the supply of housing has increased more dramatically between 2017 and 2019 and it is now more than double in the past 15 years. The estimation indicated that new supply is reach records of 45% and 55% in 2020 and 2021, respectively. The excess of the supply will also rise massively for the coming five years. The housing glut situation is expected to get worse when we consider the fact that growth in number of houses outpaces the population change (see Figure 7). On top of this, household size has fallen steadily until recent years (see Figure 8), suggesting a steady decrease in the demand for houses. Home mortgage growth has far outpaced household income increase (see Figure 9), suggesting that households are facing severe financial constraints. Finally, the national household debt has ballooned driven by mortgages (see Figure 10), suggesting many households are in high gear and thus reducing their eligibility for house loan. In addition, the following factors will also have strong impact on housing glut. They are as follows: land bank prices are steadily increasing, pushing up the cost of housing and affecting affordability; slow economic growth drags down on income growth; a rush to build residential properties such as high-rise condominiums as developers try to profit from the fast increasing prices; and last but not least, income increase is at a low level (Chapman, 2006). Through economic analysis, it seems likely that there is no coordination between developers and government agency nor proper and regular consumer demand survey being conducted.

4.1.2 Housing affordability. The housing affordability issues became a concern of many countries in the world. This led to inability of B40 and M40 population group to buy houses because of the lack of funds while their income does not qualify them for the loan amount that they need to meet the purchase. The mortgage amount depends on the price of the house which is determined by land cost, construction cost, compliance cost and profit margin set by the supplier or developer. In addition, homebuyers would want a house of a minimum standard for a decent home that is socially accepted minimum level of standard of housing (which we will refer with the term SAMASH). SAMASH normally varies according to location and culture and also with respect to time and economic improvement. There is no agreement as to what constitutes SAMASH. This is especially more significant in this



Note: *Includes overhang and unsold residential properties under construction. Includes Small Office/Home Office and serviced apartments
Source: National Property Information Centre

Figure 6.
 130,690 unsold residential units, the highest in the decade



Note: Shaded area represents estimates of incoming supply going forward. For projects in the planning stage, new supply is assumed to enter the market by 2020 (45 per cent) and 2021 (55 per cent)

Source: National Property Information Centre Jones Lang Wootton and Bank Negara Malaysia estimates

Figure 7.
Annual incoming supply of houses 2017-2019

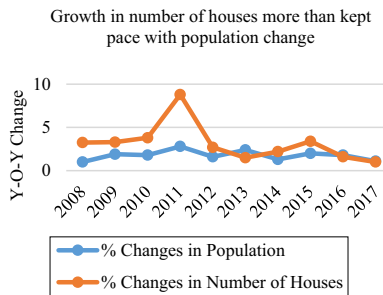


Figure 8.
Growth in number of houses far outpace

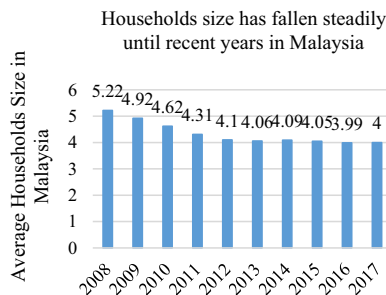
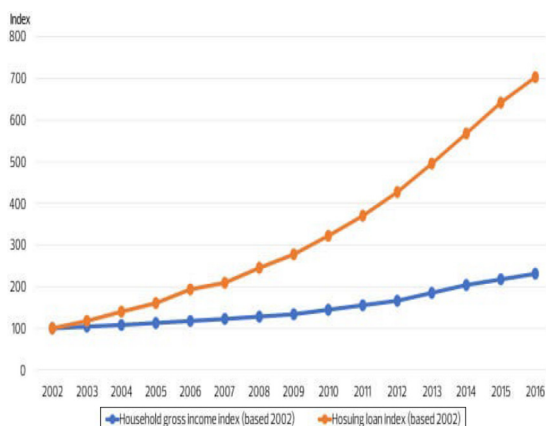


Figure 9.
Household size falls steadily during 2008-2017 with population change

Mitigating housing glut



Source: NAPIC

Figure 10.
Housing loans
increases more than
household income

modern world of fast evolving lifestyle which influences the perception of people of their wants and needs. For example, according to the definition of affordability (which states that the maximum level of housing price one can afford is equal to three times his annual income), houses costing RM300,000 and above are unaffordable to the related income level. This definition of affordability is a measure of the financial capability of house buyers to buy certain category of houses. Cases of deviation from this affordability definition will arise if one cannot accept his own level of SAMASH. Thus, the willingness and capacity to accept this price level depend on the buyer's expectations of SAMASH and also on the increase of nominal income because of strong economic growth. These aspects of human needs and preference evolve constantly which again demonstrates that regular market and consumer feedback survey is necessary to collect detailed data to understand the condition and trend of housing affordability in Malaysia. Adopting the approach of [Yip *et al.* \(2018\)](#) in setting the affordability index threshold value at 130, [Figure 11](#) displays the housing affordability index in Malaysia. The figure shows that housing affordability was not an issue from 1990 to 2009. Thereafter, the issue started and the phenomenon coincided with



Source: NAPIC

Figure 11.
Household debts
increase substantially

the period after the subprime financial crisis started in the USA. This computation is grounded on concept that housing affordability is an issue if the index is less than 130 (Yip *et al.*, 2017). As a result, a crucial question arises: Does housing affordability increase or decrease housing glut? Figure 1 shows that a higher number of overhang housing units are affordable homes priced less than RM100,000, suggesting that housing affordability cannot decrease housing glut. This phenomenon also shows that there are many homebuyers refused to accept their social economic status and financial capability according to the definition of housing affordability (value of dream house cannot be more than three times the annual household income). Moreover, this is a sample-specific result. By conventional wisdom, we expect increasing housing affordability will at least mildly decrease housing glut. However, the statement “housing affordability cannot lower housing glut” is disputable because we do not have details on the locality and connectivity aspects as well as the design and layout of all these unsold houses.

The second issue is that there is no common definition of housing affordability index. We analyze the definitions available and see which one is more suitable in Malaysia. We adopt the unique definition used to construct Figure 10, which was used by Yip *et al.* (2017), which shows a net upward trend in the expansion of household debts over the period 2000–2017. Figure 1 illustrates the range of prices for the unsold housing units: unsold units below RM100k constitute 31.5%, whereas unsold units between price ranges RM300k and RM500k constitute 29.6%. These two price ranges are supposed to be affordable price. Thus, this simple fact illustrates to us that housing affordability is not the main factor for housing glut. Moreover, Figure 1 shows that there is a significant number of unsold units in every price range. However, ironically, housing glut problem is more serious for affordable houses. The conclusion from this connection is housing affordability is not the major cause for housing glut. We need to investigate the supply chain and demand influencing factors for housing to come out with some credible steps to mitigate housing glut. We propose to verify this simple fact by using cointegrating regression method.

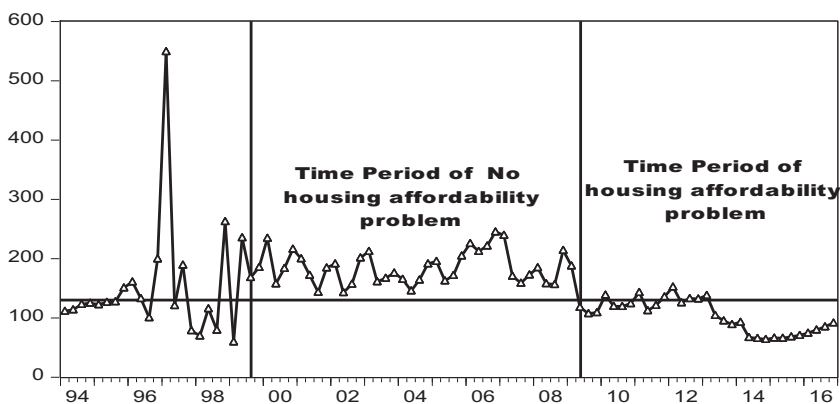
4.1.3 Housing price. Figure 13 tracks the house price movements in Malaysia over the period 1990–2015. The short period of sharp housing boom in the early 1990s was wiped off during the Asian Financial Crisis (1991–1998). Thereafter, housing prices staged a sharp rebound over the following three years until around 2001 when prices sort of hover about a plateau until 2009. Housing prices have increased by an average of 7.3% per year between 2001 and 2005, and recorded an average increase of 6.1% for the period 2006–2010. And for 2010–2012, prices increased sharply by 9.4% per year and seemed to have reached a turning point. Since then prices have been on a gradual downtrend.

The sharp average annual increase in house price in Malaysia over the period 2000–2012 demonstrates a phenomenon of a booming housing market, and therefore a signal of the housing bubble. Nevertheless, the rapid increase in housing prices may not result in sharp overhang of houses during the corresponding period (we are unable to confirm on this aspect as there seemed to be absence of data in this regard). Yet, according to recorded data, houses overhang has started rising at a rapidly increasing rate since 2014, slowing down only around late 2016 when the trend caused much alarm among the public as high prices eroded their home-purchasing capability. Looking into the data presented in Figures 1 and 2 where unsold houses of all price categories are moving up, it projects an impression that housing glut is not affected significantly by housing price. Analysing the trend of housing price and rate of house overhang in Figures 13 and 2, respectively, reveals that housing glut is not significantly influenced by housing price. However, conventional wisdom will incline to position any increase in housing price will increase housing glut, however mild the change may be. Hence, this scenario too points to other significant influencing factors.

We contend that one of the factors is in view of the relatively slow growth in income, purchasing capacity has been eroded resulting in buyers withholding commitment for home purchase so that limited changes in prices will have little effect on buying trend.

4.1.4 *Economic growth.* Based on Figures 12 and 14, the period GDP growth decreases is well correlated with the period of housing unaffordability. This is a clear demonstration that there is also a strong association between housing affordability, housing glut, economic growth and housing price. This is supported by the economic theory that economic growth will increase income, raising the purchasing capability of consumers, thus making houses become more affordable and, as a result, housing glut will drop. However, housing price is expected to move up because as income level increases, so will demand for houses.

4.1.4.1 *Conclusion from qualitative analysis.* Using economic analysis, we find that housing glut is caused by oversupply which cannot be absorbed by current demand. Economic growth is a demand variable as well as a supply variable. Economic growth will increase economic activities, bringing wealth to the nation, and increase the income level of



Notes: Figure 11, 12 and 13 are taken from Yip *et al.* (2017)

Figure 12.
Housing affordability problem

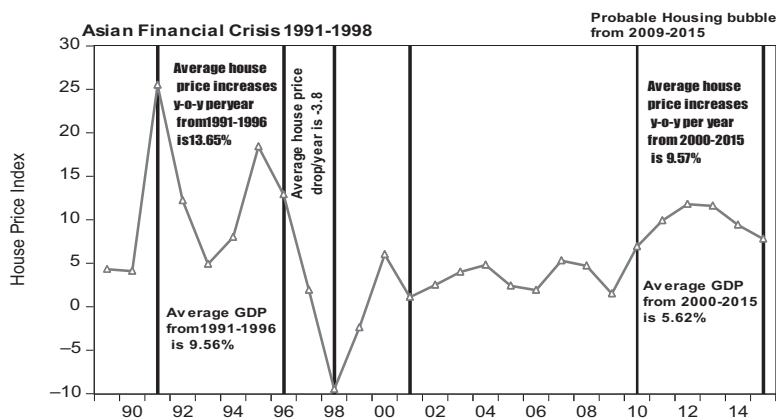


Figure 13.
Increase in housing price

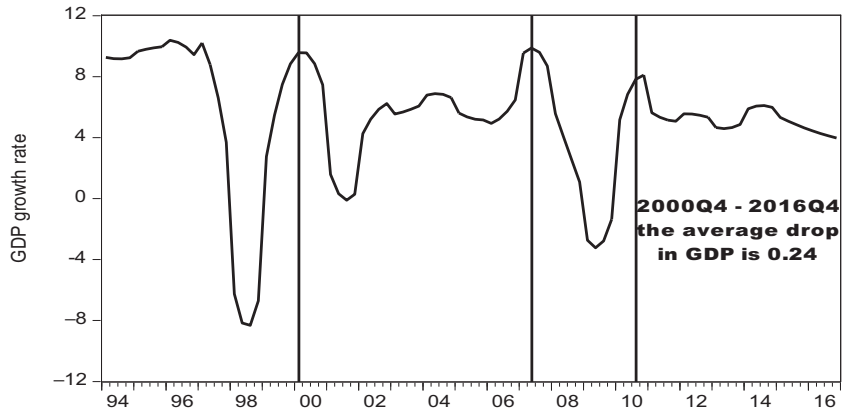


Figure 14.
GDP growth rate

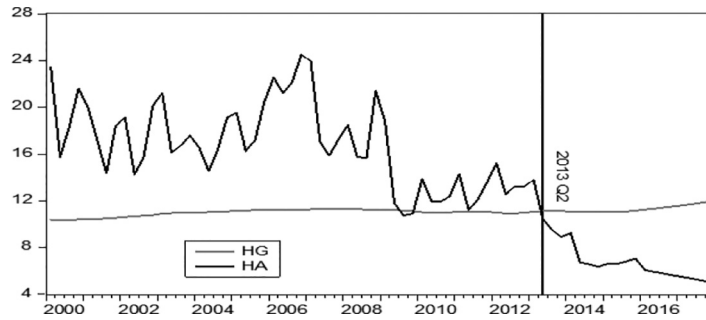


Figure 15.
Housing glut (HG)
versus housing
affordability (HA)

the people. However, if the growth in income lags behind housing price increase, we would expect housing glut to increase. As for housing price, it can increase housing glut in a small way on average because at certain time, the two variables are negatively related, while at other time, they are positively related because of the influence of social and economic environment factors discussed above. On the other hand, in general, increasing affordability will have a positive impact on the uptake of homes and thus bring down housing vacancies but again subject to the presence of the right social and economic factors. From the foregoing analysis, the impact of the three investigation factors on housing glut is affected by specific social and economic factors present in the environment.

4.2 Quantitative method

In this section, we discuss on the aspects of economic theory, statistical modelling and economic analysis and then use these research methods to examine the housing glut dynamics especially with respect to effect of housing affordability, housing price and economic growth on housing glut. As for economic theory, we use the supply and demand curves. With statistical modelling, we use cointegrating regression for the analysis in view that we need to estimate the long-term impact of the determinants on housing glut for designing effective policy to mitigate housing glut. For economic analysis, we base on conventional wisdom and logical deduction method.

For computing the relative impact of HA, HP and EG on HG (where HA, HP, EG and HG denote housing affordability, housing price, economic growth and housing glut, respectively), this study uses the coefficients of regression as a ranking measure (Yip *et al.*, 2016). However, this ranking measure has some shortcomings of inconsistency in the definition of standardized coefficients (Darlington, 1990). To solve this issue, this study uses Bring (1994) definition of a consistent partial standard deviation. We use standardized regression coefficients [1] for ranking measure.

Our model consists of two components: qualitative and quantitative. Our final product is a model procedure to mitigate housing glut. The quantitative component comprises HA, HP, EG and other factors. The qualitative component includes construction cost, land cost, compliance cost, local authority's planning, connectivity, locality and independent comprehensive consumer housing survey. These qualitative components are basically sample specific in nature and that they are correlated to housing policy matter. As such, we do not research on them in detail in this paper. However, we use some of them to explain any anomalies between observed results and expected results. The major determinant of housing glut is economic growth which is correlated with all other components. All these determinants, if manipulated correctly, are expected to lower housing glut. The main tasks of the model are to estimate the housing glut qualitatively, and then compute and analyze the relative importance of each determinant by using statistical modelling and, based on the result of analysis, come out with a procedure to mitigate housing glut.

4.2.1 Cointegrating regression. As the key variables under study are correlated with one another, as discussed previously, the use of normal regression technique could not be appropriate without modification. Therefore, this study traces the correlation matrix for all the selected variables. Next, we test the existence of unit root for each variable and if each one is an I(1) integrated variable, then we conduct cointegrating regression of housing affordability, housing price and economic growth on housing glut. For testing unit root [2], we use Augmented Dickey-Fuller test (ADF) and Kwiatkowski-Phillips-Schmidt-Shin tests (KPSS) complimentary test. We regress housing price on housing glut, followed by housing affordability on housing glut and then economic growth on housing glut. We select simple regression format to avoid multicollinearity problem. Using simple regression model, we can obtain the total impact of the independent variable on housing glut and so comparing the total impact of each of the three independent variables is viable than using partial coefficients for comparison. In addition, instead of using normal regression coefficients, we also use an adjusted regression coefficient formula to estimate the respective impacts.

However, for HA, we have no choice but to regress HA, and EG on HG. This is because conducting a simple cointegrating regression of HG on HA does not yield significant coefficient for HA. The reason could be, HA by itself is not cointegrated with HG. Nevertheless, if combined with EG, it is cointegrated with HG. Moreover, we need the individual impact of each of the independent variables on the dependent variable only which is then used to construct the proportion for relative impact. We use simple cointegrating regression technique for two purposes: one, to estimate the long-run impact of HA, HP and EG on HG and, two, to circumvent autocorrelation and heteroscedasticity problem.

The formulae for the cointegrating regression are shown in Models 6, 7 and 8. We use fully modified ordinary least square (FMOLS) estimation method for the estimation. We choose FMOLS over Canonical Cointegrating Regression and Dynamic Ordinary least squares because it has reasonable small sample bias and, on top of all, the results are easy to

interpret. In equations (5)–(7), HG, HA, HP and EG stand for housing glut, housing affordability, housing price and economic growth.

Model 1:

$$HG_i = \beta_0 + \beta_1 HA_i + u_i$$

Model 2:

$$HG_i = \beta'_0 + \beta_2 HP_i + u_i$$

Model 3:

$$HG_i = \beta''_0 + \beta_3 EG_i + u_i$$

5. Empirical analysis and conclusion

5.1 Empirical results using cointegrating regression

Table 1 shows the results when Models 1, 2 and 3 are run by cointegrating regression using FMOLS estimation method. The results indicated that there is a negative relationship between housing affordability and housing glut. This is in line with logical deduction whereby if there is decrease in housing glut, it is expected housing price will increase and thereby making housing affordability increases. The outcome from Table 1 shows the housing glut would decrease by 0.0097 units if housing affordability increases by 1 unit. On the contrary, the results also indicated that there is a significant positive relationship between housing price and housing glut. An increase of housing price by 1 unit will lead to increase of housing glut by 0.022 unit. This is in agreement with our common sense deduction. In addition, the results revealed that an increase of economic growth by 1 unit will lead housing glut to increase by 0.02 unit. In absolute term, the effect of housing affordability, housing price and economic growth on housing glut can be represented approximately by the proportion 1:2:2 [3]. This shows that economic growth and housing price have a similar effect on housing glut when compared to housing affordability, which is in line with our economic theory analysis and it is also logical as a strong economic growth increases income level and consequently improves buyers' financial capability. On the other hand, housing affordability exerts roughly half the impact negatively on housing glut as housing price and economic growth.

Dependent variable: housing glut	Model 1	Model 2	Model 3
Housing affordability	0.021**		
Housing price		0.049**	
Economic growth			0.04**
Intercept	11.21**	10.41**	10.9**
Cointegrated variables	HG; HA	HG; HP	HG; EG
Standardized regression coefficients	-0.0097	0.022	0.02
Variance inflation factor	1.033	1	1
Jaque Bera normality test statistics	4.01**	3.22**	3.87**
Long-run standard deviation	0.463	0.45	0.51

Table 1.
Long-run relative
impact of HA, HP
and EG on HG

Notes: All three models show long-run relationship among variables: all pass the normality test; **indicates 5% significance

In this perspective, [Table 1](#) shows that the coefficients of HA, HP and EG are all at 5% significant. As explained earlier, we use standardized coefficients for measuring the respective impact. A one-unit increase of housing affordability causes housing glut to decline by 0.0097 unit. An increase of 1 unit of housing price also results an increase of housing glut by 0.022 unit. This advocates that housing glut is somewhat affected by insufficient supply of affordable homes as opposed to what is presented currently by property agency researchers that housing affordability exerts severe impact on housing glut because developers focus on supply of higher price houses. A rational explanation for this phenomenon is that, in general, there is a severe mis-matching between type of demand and supply of housing. As explained early, many social economic status conscious homebuyers would like to buy more expensive houses than they could afford according to their financial capability.

Hence, this seems to show that housing price and housing affordability do not have strong impact on the issue of housing glut, a point which is contrary to conventional wisdom which has it that price and sales are inversely correlated with each other. Therefore, these results again point to the presence of other influencing factors on consumers' purchasing capability and decision. And the phenomenon of housing glut in the midst of strong housing demand strongly suggests the fact that current supply does not meet the affordable home profile of potential buyers, which in turn means that developers have not been sensitive to the real conditions and trend in the housing demand aspect before putting new supply into the market. Another point that could be deduced from the above results is that because of stretched financial capacity, changes in housing price will have little effect on commitment on home purchase. Therefore, a conclusion from this scenario is that players on the supply side, both developers and the government authorities in their haste to increase supply in the hope of meeting market demand, have neither given sufficient attention to all factors which affect home sales resulting in houses that are not compatible with the profile of buyers' minimum acceptable home characteristics nor accorded sufficient emphasis on policies to improve the income level of the people.

5.2 Policy implications

The absolute ratio of 1:2:2 suggests that housing price and economic growth exert equal impact on housing glut positively, whereas housing affordability exerts about half their impact on housing glut negatively. This implies that the government should focus more on housing price and economic growth to mitigate housing glut while keeping an eye on housing affordability. However, on the ground, it seems that housing affordability has more severe effect on housing glut qualitatively. This could be because of the fact that many house buyers have no concrete measurement of their financial capabilities. Notice that in [Figure 1](#), from 2018 to 2019, the year-on-year housing glut has decreased as much as 5.1% and this decrease is mainly because of government invention initiating Home Ownership Campaign where various tax exemptions are given to house buyers. This suggests that Home Ownership Campaign is an effective scheme to reduce housing glut. The Malaysian government could have more of this type of Home Ownership Campaign to mitigate housing glut.

6. Graphical analysis

[Figure 16](#) shows that from 2013Q2 onwards, there is a reverse relationship between affordability and housing glut. This confirms the findings of this study reported in [Table 1](#).

[Figure 16](#) also indicated that from 2003Q4 onwards, there is a positive relationship between housing price and housing glut. This exposes the statement that the key factor that leads to housing glut is the higher housing prices. The graphical analysis shows that this is

not the case as Figure 16 revealed that housing glut is slightly increased because of the effect of higher housing price (Figure 17).

Figure 18 indicates a negative relationship between economic growth and housing glut from 2014Q3 to the current time. These findings confirm the results presented in Table 1. Therefore, this study concludes that housing price, housing affordability and economic growth do not influence housing glut significantly.

With respect to the range of housing glut values which are considered as crucial, we are of the opinion that the upturn point of housing glut is a warning bell as an escalating glut situation has the potential to turn the housing cycle into a housing bubble. Figure 18 shows that the upturn of housing glut occurred at 2015Q1. That is, policymakers would have to make effective adjustment to the housing market policy so as to address the upturn of housing glut starting from 2015Q1.

7. Conclusion

The general consensus is that housing glut is affected by the high price of houses and insufficient supply of affordable homes as developers focus mainly on higher price residential properties. In addition, there are also media articles and reputable reports which have concluded that the current housing glut is the consequence of lack of coordination among the three stakeholders, namely, the buyers, developers and government authorities in putting housing supply onto the market. However, our empirical results obtained using

Figure 16.
Housing glut versus housing price

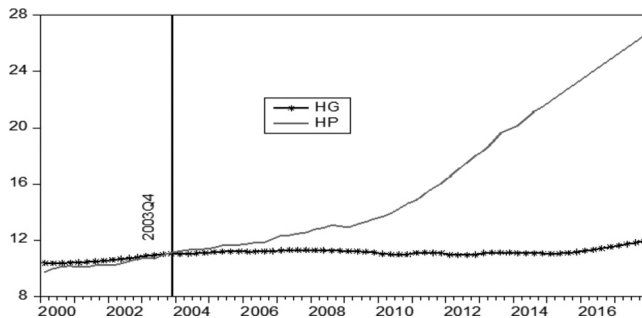
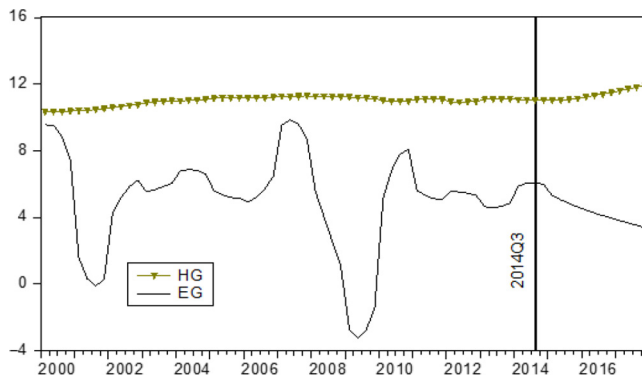


Figure 17.
Housing glut versus economic growth



Mitigating housing glut

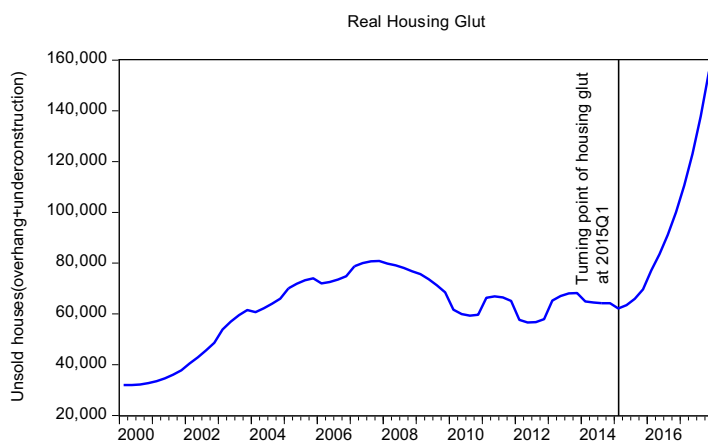


Figure 18.
Turning for housing glut

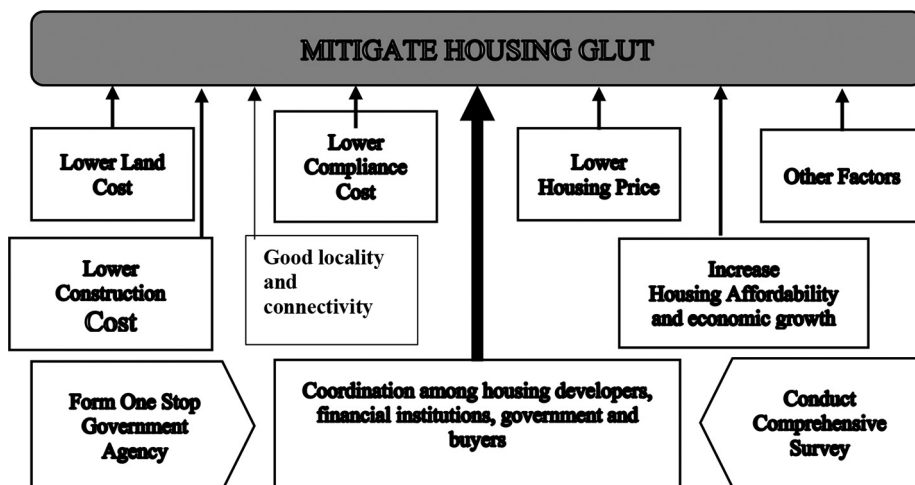


Figure 19.
Procedure to mitigate housing glut

graphical, economic analysis, economic theory and statistical modelling suggest that this public perception is only correct to a small degree.

Our statistically derived results show that all the three factors, namely, housing affordability, housing price and economic growth, have low but nonetheless different degree of impact on housing glut. Based on our statistically derived results, per unit increase in housing affordability will bring about approximately 0.097 unit of housing glut decrease and 0.022 unit increase in housing glut for per unit increase in housing price. On top of this, the results also show that economic growth affects housing glut in a way that one unit increase in economic growth will decrease housing glut by 0.02 unit. Thus, in absolute term, the relative impact of housing affordability, housing price and economic growth on housing glut is roughly in the proportion of 1:2:2, suggesting economic growth is the main driver for countering housing glut. The qualitative analysis reveals the situation of relatively high overhang of affordable houses compared to other price categories. Our results apparently

defy rational perception based on economy theory and convincingly show that other factors have strong influence on housing glut. Further analysis reveals the relationship between buyers' purchasing decision and social factors such as locality, connectivity and physical attributes of the house; and economic factor – the rate of income growth that affects the financial capacity of buyers. The final conclusion based on our results in comparison with the housing glut situation is that the main contributor to increasing housing vacancies is the haphazard and hasty approach of developers and the authorities in their efforts to satisfy housing demand.

From our results and conclusion, to avoid the occurrence or mitigate housing glut, the government should put comparatively greater emphasis on driving the economy to improve household income. There should be closer and coordinated efforts among the various agencies of the authorities, including the economic development agencies, as well as with the housing industry to ensure development of housing will encompass the installing of essential social amenities, employment and economic activities to be within easy accessibility. Developers or suppliers of housing should have clear understanding of the social and economic profile of consumers and thus put up compatible type of residential properties. Thus, we can summarize and make use of the findings to devise a procedure to mitigate housing glut as illustrated in Figure 18. We can conclude that to avoid or reduce the possibility of occurrence of housing glut, houses should be built in the right place, right way and at the right price. We would suggest that further research be conducted to look into the benefits and advantage of incorporating housing in the land and industrial development masterplan of the nation and also the value of the interior characteristics and exterior environment on house price.

Notes

1. The standardized regression coefficient is given by $\beta_j = \beta_j^* \frac{s_j^*}{\sqrt{VIF}}$ where $\beta_j, \beta_j^*, s_j^*$ and VIF are the standardized regression coefficient, coefficient of regression, standard deviation of regression and variance inflation factor, respectively.
2. Each of HG, HA, HP and EG rejects null hypothesis of no unit root for ADF test and accept null hypothesis of unit root for KPSS test at 5% significance level.
3. $|HA|:|HP|:|EG| = 0.0097:0.022:0.02 \sim 1:2:2$.

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Corresponding author

Abdelhak Senadjki can be contacted at: abdelhak@utar.edu.my

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