



UNIVERSITI PUTRA MALAYSIA

***HOUSE PRICE DETERMINANTS AND THEIR IMPACT ON
CONSUMPTION
AND FERTILITY***

WONG WANG LI

FEP 2017 15



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AND FERTILITY**

By

WONG WANG LI

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in
Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

March 2017

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

HOUSE PRICE DETERMINANTS AND THEIR IMPACT ON CONSUMPTION AND FERTILITY

By

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March 2017

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The role of housing market in an economy is important in modern era as it brings a huge impact to an economy. Substantial increase in house values over recent years (2000 - 2013) have led to an economic policy debate on its effects on economy. This study investigated the house price determinants and its effects on consumption and fertility using time series and panel data in Malaysia. There is a mounting amount of literature that reveals the significance of fundamentals variable on housing price and its strong relationship between housing wealth and consumption, as well as housing price on fertility. Income and population is the major fundamental variables to determine housing price. But the increasing housing price may cause by speculation force and foreign inflow, which are prone risk in an economy. This study consistently found that the housing price hike from year 2000 to 2013 were supported by fundamentals, whereas speculation force was weak or yet to exist. On the top of that, the impact of foreign inflow on housing price was found to be limited. Housing price impacts household in several channels. Housing wealth channel traditionally impact household spending through financial system. Malaysia has unique financial system which is different from most of the countries, therefore the impact of housing wealth remained ambiguous. This study also found that the price variation in the Malaysia housing market is associated with consumer spending but in a different manner when compared with most of the existing literature. The absent of various housing related securities in Malaysia is one of the possible reason that caused the distinction of consumer spending behaviour on housing price variation. Fertility decision is generally determined by socioeconomic factors. Income, healthcare cost, education cost and other cost of living were the main determinants of fertility. The increasing housing price in Malaysia may impact fertility in both positive and negative way by wealth and cost of living channel. This study found that fertility is associated with increasing housing price and it functions as a cost of living and found negatively associated with fertility.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

PENENTU HARGA RUMAH DAN KESAN TERHADAP PERBELANJAAN DAN KESUBURAN

Oleh

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Peranan pasaran rumah dalam suatu ekonomi adalah penting pada era moden kerana ia akan membawa kesan yang amat besar kepada ekonomi. Turun naik nilai rumah yang agak besar sejak kebelakangan ini (2000 – 2013) telah membangkitkan perdebatan polisi ekonomi yang hangat pada kesanya terhadap ekonomi. Kajian in akan mengkaji penentu harga rumah serta kesan-kesannya terhadap perbelanjaan dan kesuburan dengan menggunakan data siri masa serta data panel dalam Malaysia. Banyak kajian lepas menunjukkan bahawa terdapat perhubungan antara pembolehubah asas dengan harga rumah, serta perhubungan antara kekayaan rumah dengan perbelanjaan, dan juga antara rumah harga dengan kesuburan. Pendapatan dan jumlah penduduk adalah pembolehubah utama untuk menentukan harga rumah. Tetapi kenaikan harga mungkin disebabkan oleh kuasa spekulasi yang mewujudkan risiko kepada ekonomi. Kajian ini mendapati bahawa kenaikan harga rumah dari tahun 2000 ke 2013 adalah ditentukan oleh pembolehubah asas dengan konsisten, sedangkan kuasa spekulasi adalah lemah atau belum wujud. Selain itu, impak dari pelaburan asing kepada harga rumah juga agak lemah. Kajian ini juga mendapati bahawa perubahan harga di pasaran rumah Malaysia berkaitan dengan perbelanjaan pengguna dengan cara yang berbeza jika berbanding dengan kajian lepas. Malaysia mempunyai sistem kewangan yang unik dan ditadbir oleh bank pusat secara ketat. Perbezaan dari segi tingkah laku perbelanjaan pengguna terhadap perubahan harga rumah ini mungkin disebabkan oleh ketidakhadiran sekuriti rumah yang berkaitan di pasaran Malaysia. Keputusan kesuburan secara umumnya ditentukan oleh faktor sosioekonomi. Malaysia adalah negara yang berbilang kaum serta mempunyai budaya masing-masing. Kajian ini mendapati keputusan kesuburan juga berkaitan dengan perubahan harga rumah. Harga Rumah sebagai salah satu kos sara hidup dalam kajian ini terdapat mempunyai hubungan secara negative terhadap kesuburan tanpa mengira kaum. Walaupun semua kaum mempunyai tingkah laku yang serupa, tetapi ia berbeza dari segi tahap impak antara kaum dan perbezaan ini adalah disebabkan oleh faktor sociopolitik.

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I certify that a Thesis Examination Committee has met on 22 March 2017 to conduct the final examination of Wong Wang Li on his thesis entitled "House Price Determinants and their Impact on Consumption and Fertility" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
AFC	Asian Financial Crisis
AIC	Akaike Information Criterion
ANN	Artificial Neural Networks
ARDL	Autoregressive Distributed Lag
CBD	Central Business District
CF	Certificate of Fitness
CIDB	Construction Industry Development Board
CPI	Consumer Price Index
DIBS	Developer Interest Bearing Scheme
DOLS	Dynamic Ordinary Least Square
DOSM	Department of Statistics Malaysia
ECM	Error Correction Model
ECT	Error Correction Term
FDI	Foreign Direct Investment
FE	Fixed Effect
FMOLS	Fully Modified Ordinary Least square
GDP	Gross Domestic Product
IBS	Industrialized Building System
IFS	International Financial Statistics
KPSS	Kwiatkowski–Phillips–Schmidt–Shin
LM	Lagrangian Multiplier
LCH	Life Cycle Hypothesis
JPPH	Valuation and Property Services Department

MPC	Marginal Propensity to Consume
MBS	Mortgage Backed Securities
MM2H	Malaysia My Second Home Program
MSBB	Monthly Statistical Bulletin by BNM
MSBD	Monthly Statistical Bulletin by DOSM
NEP	New Economic Policy
OLS	Ordinary Least Square
PIH	Permanent Income Hypothesis
PMG	Pool Mean Group
PP	Philips-Perron
PTPTN	National Higher Education Fund Corporation
SBC	Schwarz Baysian Criterion
SOHO	Small Office Home Office
TFR	Total Fertility Rate
RE	Random Effect
REIT	Real Estate Investment Trust
RPGT	Real Property Gain Tax
UK	United Kingdom
US	United States
VECM	Vector Error Correction Model

CHAPTER ONE

INTRODUCTION

1.1 An Overview

House is one of the necessities for human which act as a shelter. During Stone Age, houses were built by stones and timbers. The function of house as a shelter still remains until modern era as it has undergone technological advancement. The building process is far more complicated but equipped with more comfortable and safety features. Due to the complicate and technical process, specialization is needed in order to obtain economic of scale. Today, we no longer build a house by ourselves, instead purchase it directly from the developer.

As many other consumer goods, the price of house depends on supply and demand. In terms of demand factor, buyers will set the bid price for a house based on utility. Different types of characteristic of a house will give different satisfaction for the potential buyer. For instance, a buyer is willing to pay a higher price for a landed property if compared to an apartment. House price varies accordingly to the characteristic of a house. Land area, build up area, number of rooms, location, and many other characteristics will determine the price (Goodman, 1978; Jim and Chen, 2007; Selim, 2009). In addition, the bid price of buyer is constraint by income. Buyers barely buy a house by cash settlement instead they obtain a long term loan from a bank and pay monthly instalment which can be up to 35 years. Therefore, the other important factors that affect the house price in demand perspective is income (Mankiw and Weil, 1989; Holly and Jones, 1997; Xiao and Park, 2009).

On the other hand, as a supplier of house, developer and existing house owner will set the ask price for a house. Developer set the ask price based on the construction cost as well as the profit margin that they desire (Porteban, 1996). On top of that, developer and existing house owner will observe the housing market by looking at the recent transaction volume and price in order to decide a best ask price.

Today, this supply and demand mechanism is impacted by financial innovation. Housing price formation became even complicated when housing investment and speculation activity take place. Securitization process provides an additional channel for investor and speculator to invest. Instead of buying a house, they can purchase securities such as mortgage backed securities (MBS) and Real Estate Investment Trust (REIT). All these investment and speculating activities will create uncertainty to housing market and these uncertainties certainly will affect everyone; both in business sectors and household sectors due to its necessity characteristics and broad involvement in economy.

Not all the countries will have the same impact from housing market on economy. Some countries may behave differently in certain extent. Other than housing wealth channel, the housing market is able to channel the impact through fertility (population) to economy. According to Pinilla et al. (2008), low fertility will cause depopulation and limited economy growth. There are various reasons of low fertility in this modern era which are limited resources (income) and high cost of living. High housing expenditure will lead to low fertility whereby housing is an additional necessity for children and it is one of the major household expenses.

Nevertheless, the characteristics of an economy are different from one country to another; each country have their own unique characteristics. It is all depends on the socio economic structure of a country that eventually affects household's consumption and fertility decisions. Therefore, in order to identify the "treat or threat" from housing market in Malaysia, some basic understanding of Malaysian housing market is needed.

1.2 Malaysian Housing Market

Housing market is the largest category among the property market. According to Valuation and Property Services Department (JPPH), there is a total of 5,093,068 units of existing property¹. 90.71% or 4,982,055 are residential units, 7.49% or 411,205 are shop units and 1.80% or 99,119 are industrial units. Generally, there are four categories of houses in Malaysia: Detached, semi-detached, terrace and high rise. There are many types of houses with different amenities under these four categories, such as bungalow, rumah tinggi (traditional house), linked house, town house, condominium, apartment and so on. Figure 1.1 shows the composition of residential units in Malaysia.

The existing residential units increase steadily in recent years, from a total of 4,512,665 units in year 2011 to 4,718,534 and 4,982,055 in 2013 and 2015. Semi-detached houses hit highest growth of 16.97% in these five years and followed by high rise, terraced, detached and low cost houses that reached 12.44%, 9.93%, 7.78% and 2.91% respectively excluding other types of houses. Other types of houses are such as town house, cluster house and Small Office Home Office (SOHO).

¹ Excluded office building and shopping complex due to the data is not comparable. Office building and shopping complex measure by space occupied.

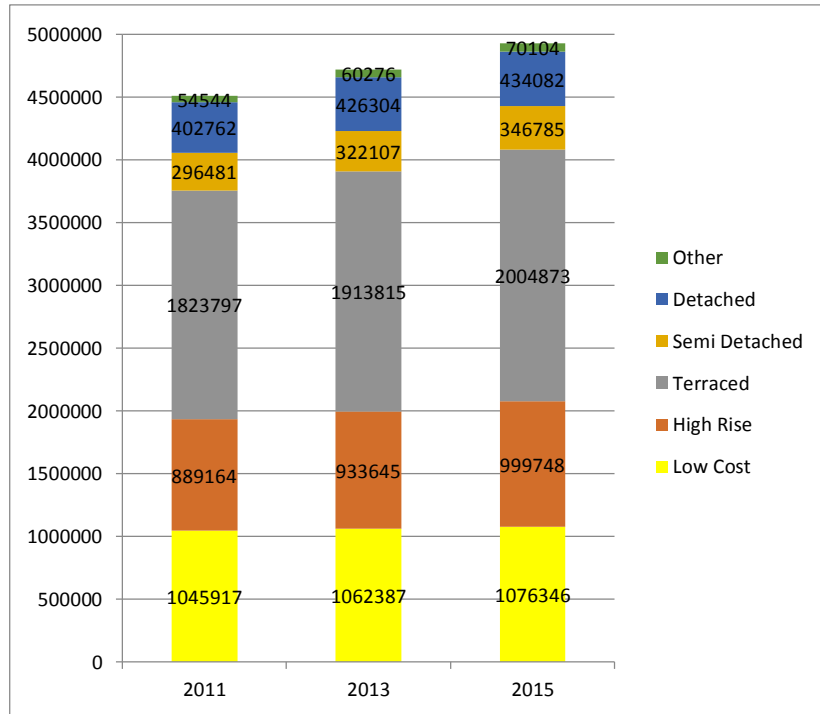


Figure 1.1: General Types of House in Malaysia 2011 - 2015
(Source: JPPH)

Based on Figure 1.1, majority of homeowner occupied terraced houses, this may be caused by various reasons such as preferences, affordability, speculation or some other regional factor. These entire factors may contribute to the demand of housing which may lead to the increasing price and the main concern will be speculation which may bring more harm than gain. Notably, the number of service apartment² and SOHO type residential units had increased substantially within these five years in city centre due to the lifestyle changes. In contrast, the number of both low cost houses and low cost flats have minimum growth among all the houses, hence this somewhat shows that the low income group was neglected.

High rise types of residential units are common in city area due to the scarcity of land and high population. Developer has to fully utilise the land by building more units in a small piece of land in order to cover cost and obtain profit. The housing area surrounded city centre normally consist of all types of residential units, but mostly option for non-high rise units due to its low cost of land and low cost units are able to satisfy the needs of those who require a spacious house and for those who are unable to afford a house in the city area. In state level perspective, other than land and population, housing type are determined by the economic activities. Figure 1.2 shows the state level composition of different types of house.

² Notably service apartment in Malaysia is buildings that consist of shop lot or shopping mall together with apartment or condominium. Generally shop unit located at first few floors in a building. Categorized under high rise unit.

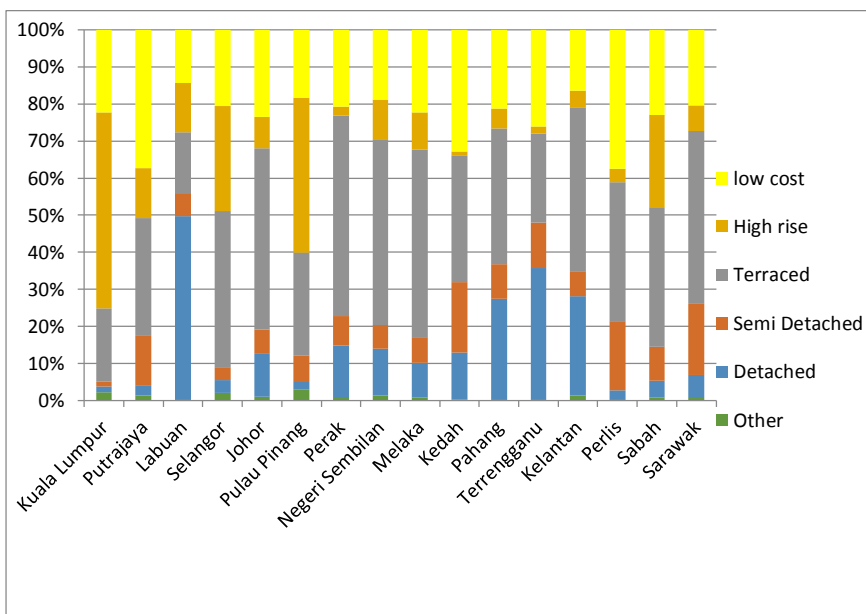


Figure 1.2: General Types of Houses in Malaysia 2015 (State Level)
 (Source: JPPH)

In reference to Figure 1.2, highly urbanized states such as Kuala Lumpur and Pulau Pinang (100% and 90.8% level of urbanization, respectively) has higher ratio on high rise residential units whereby most residents worked in commercial and service sectors. On the other hand, states such as Kedah and Kelantan (64.6% and 42.4% level of urbanization, respectively) has lower ratio on high rise residential units, where the major economic activities are agriculture and small businesses. This economic segregation somewhat explains the reason of housing market segregation which will be discussed in Chapter 2.3.4.

Other than types of residential units, price differs across the region. It can be caused by various demographic factors such as economic activities, population, income and so on. Figure 1.3 shows the aggregate national house price (bar chart, left axis) and aggregate house price for 13 states together with Federal Territory, Kuala Lumpur in recent year. Generally, national house price shows a steady growth from 2001 to 2008, but growth drastically increases after year 2008 to 2014 (Figure 1.3).

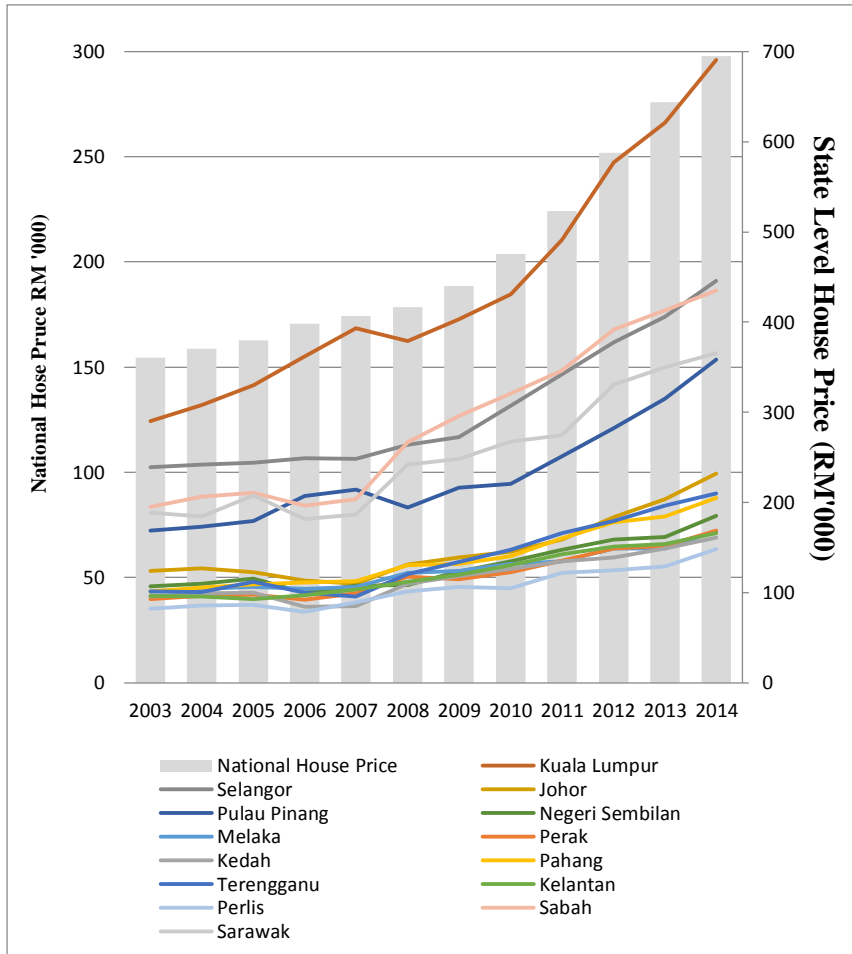


Figure 1.3: National House Price and State Level House Price
 (Source: JPPH)

In reference to Figure 1.3, Kuala Lumpur; the capital city of Malaysia exhibits the highest price among all the other states. This phenomenon was normal and happened in most of the countries whereby the capital city is always at top of the list. Next is followed by Selangor, Sabah, Sarawak and Pulau Pinang in which these states became the top five highest in Malaysia (Department of Statistics Malaysia, DOSM). Figure 1.4 portrays selected states' house price level, whereby the selected states are the most frequently traded states. Kuala Lumpur, Selangor, Pulau Pinang and Johor were selected due to its high housing price as well as some others demographic factors, such as high density and high urbanization index. The regional price level for each state is generally associated to the demographic factors as well as some other factors.

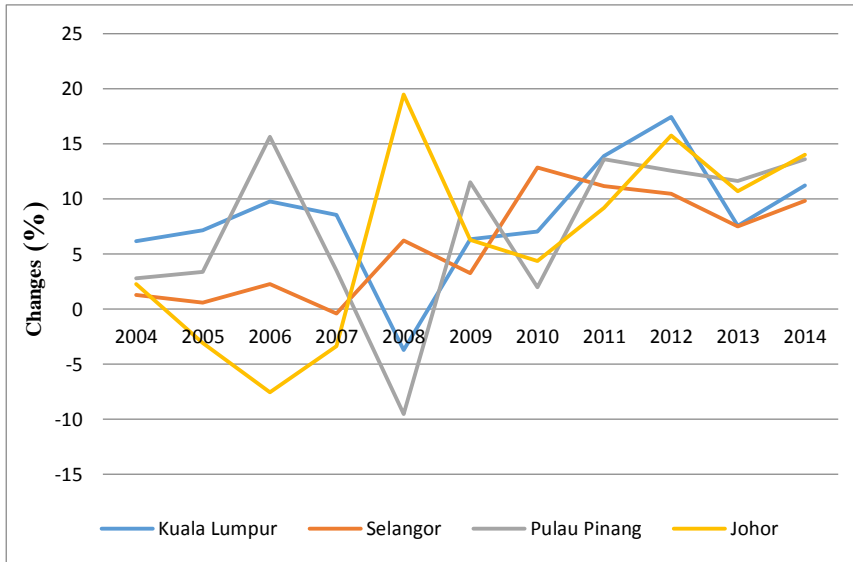


Figure 1.4: Changes of Selected State Level Aggregate House Price in Malaysia 2004 to 2014

(Source: JPPH)

Overall, housing price is achieved through steady growth from 2001 to 2014 except in 2008. National housing price growth slowed down in 2008, but still achieved positive growth. This decreased was caused by the sub-prime crisis which is originated from US and is channelled to Malaysia due to the trade relation. In reference to Figure 1.4, despite crisis in 2008, housing price in Johor and Selangor showed positive growth. The inception of Iskandar Malaysia in 2006 may have contributed to Johor's abnormal growth. Iskandar Malaysia is a mega project which is located in Johor and is targeted to lure RM 335 billion in the aspect of investment by year 2025 (Rizzo and Glasson, 2012).

In recent years, the housing construction in Malaysia had experienced a continuous rapid growth. Based on the report from DOSM, Official Portal 2013, the residential housing construction is the second largest type of construction after civil engineering sub-sector. Construction Industry Development Board (CIDB) of Malaysia has developed a 10 years master plan for Malaysian construction industry from 2006 to 2015 which includes housing construction. Besides, CIDB also promotes the usage of Industrialized Building System (IBS) in order to achieve the industrialization status of construction sector³. IBS in Malaysia was started in early 1960's when Ministry of Housing and Local Government of Malaysia visited several European countries and evaluated their housing development program. All these effort may increase the efficiency of housing production.

³ According to Mohd Kamar (2011), the definition of "industrialization" of construction sector was broad. Different country or researcher has different criteria. Malaysia adopted IBS as the standard of construction as well as the measurement of industrialization level.

Other than the production side, the sales performance of new housing market is another main indicator of housing market. Figure 1.5 shows the new launched residential units and its sales performance from year 2003 to 2015. There is a sharp decline from year 2004 to 2006, but after that the trend was relatively stable. On the other hand, sales performance slightly reduced from year 2003 to 2006 and was relatively stable after that. The sales performance may be affected due to the exemption of RPGT and stamp duty of sales and purchase agreement in year 2003. This exemption has made the transaction of existing house projects to become relatively cheaper. Thus, the existing house is more attractive than new house. Notably, there is a sharp decline in 2012 to 2013, from 47.7% to 29.7%

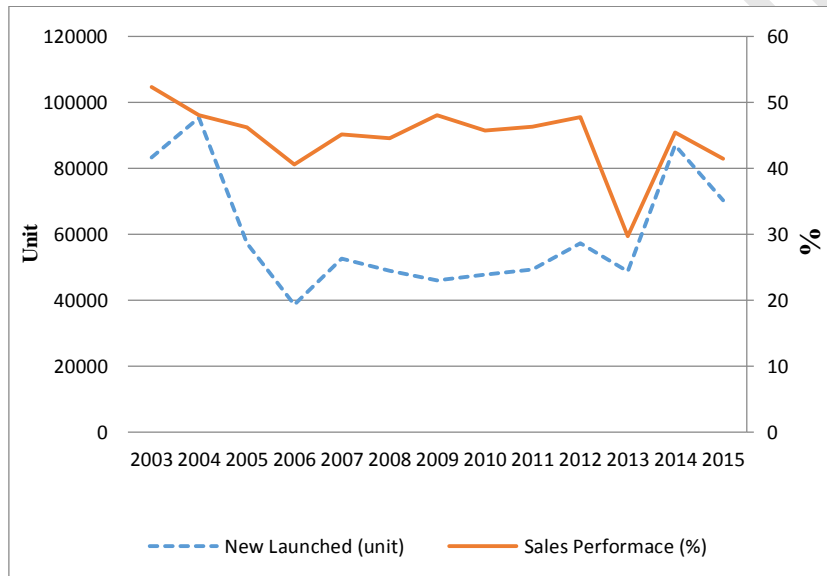


Figure 1.5: New Launched and Sales Performances in Malaysia 2003 - 2015
(Source: JPPH)

The sharp decline of sales performance in 2013 may imply that the demand was reduced and it may be signalling that housing market may begin to slow down. The increase in housing price maybe one of the factors which affect the demand. Reduction in demand may stop housing developers from producing more housing units. Since housing market link closely from business to household sectors, the slowdown of housing market may or may not impact the economy as a whole therefore, a top to bottom investigation from housing price to its impact is needed.

1.3 Malaysia Housing Price and Macroeconomic Factors

Housing market is closely related to economy due to its unique characteristics; necessity and asset with high value. Everyone has to utilise a housing unit as their shelter, either by purchasing it or renting it. According to Bank Negara Malaysia

(BNM), among all the macroeconomic factors, fundamental factors are the main drive of housing price in Malaysia, rather than financial factors⁴.

Due to the expensive housing price; income is the first consideration among all the fundamental factors when making a decision to purchase a house. . Therefore, housing price is closely related to income. Gross Domestic Product (GDP) usually acts as a proxy to represent income in a nation. Figure 1.6 shows the aggregated national housing price on the left axis and GDP on the right axis from year 2000 to 2014. Overall, both figures shows an uptrend, but declined from year 2008 to 2009 due to the global financial crisis (subprime crisis), and the GDP increased again in year 2010. In contrast, housing price did not show a downtrend during the crisis, but the speed increased rapidly than previous years, and this has shown no sign of slowing down until year 2013⁵. This can be observed in Figure 1.7. Figure 1.7 exhibits the growth rate of both GDP and national house price. Notably, the shaded areas show negative movement between GDP growth rate and national housing price growth rate. The shaded area is from year 2002 to 2009, 2010 to 2012 and 2013 to 2014. Despite a sharp decline in year 2009, housing price grow even faster than previous years from 2009 to year 2012. The growth slowed down from year 2013 onward. Overall, two components move negatively throughout most of the years.

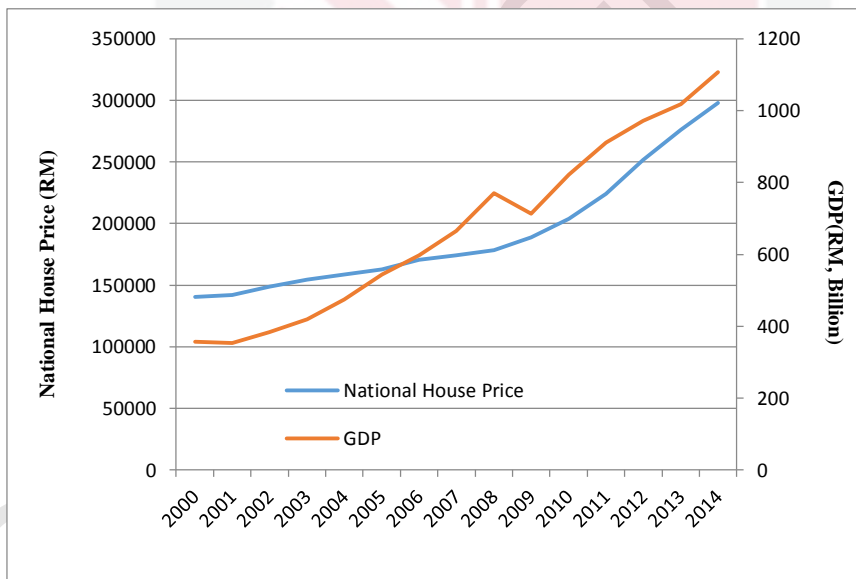


Figure 1.6: National House Price and GDP in Malaysia 2000 – 2014
(Source: International Monetary Fund (IMF) & JPPH)

⁴Risk Development and Assessment of Financial Stability in 2012, published by Bank Negara Malaysia.

⁵ Growth increased from 2.4% growth in 2008 to 12.27% in 2012, slowing down to 9.59 in 2013. Prior to year 2008, the average growth rate from year 2000 is 3.12%

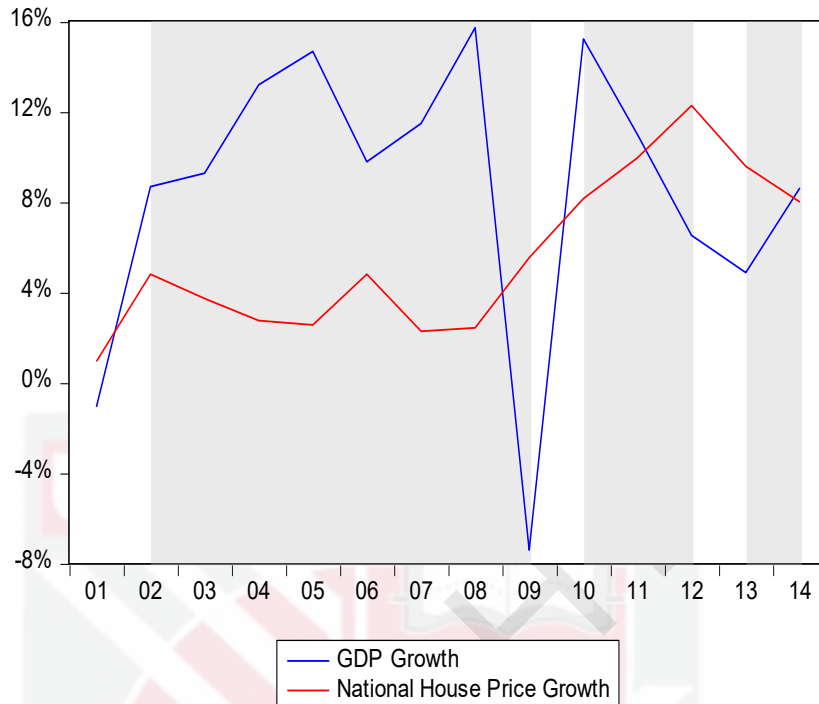


Figure 1.7: Growth Rates of National House Price and GDP in Malaysia 2001 – 2014

(Source: IMF & JPPH)

Other than income, population is one of the most important fundamentals factor that affect housing price directly. High population in an area with limited land will result in high demand but less supply of housing units, therefore push up the house price. This also explained why there is always high housing price in almost all the capital city of every country. Figure 1.8 portrays both housing price and population an increasing trend. When the total population is decomposed according to age group, an interesting pattern has been observed. Figure 1.9 shows the population distributions in Malaysia in year 1980 and 2015. This figure is also called as “population pyramid” due to its shaped like pyramid. From the figure, there is an obvious change of the pyramid shape in 1980 into a less pyramidal shape. According to Pollack (2005), this is due to higher older population and lesser younger population, and this is the beginning of the population aging. This is supported by Figure 1.10 in which Malaysian population doubled from year 1980 to 2013 but and total fertility rate (TFR)⁶dropped drastically throughout the same period. Thus, this problem motivated the study of fertility determinants to identify what caused the low fertility

⁶TFR refers to the average number of children per 1,000 women which would be born if women survived to the end of their reproductive period (Age 15 – 49) for the given year.

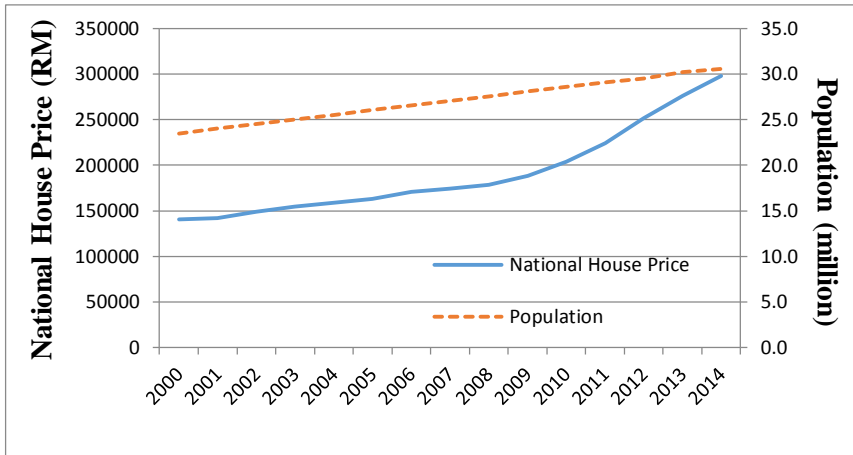


Figure 1.8: National House Price and Population in Malaysia 2000 – 2014
(Source: IMF & JPPH)

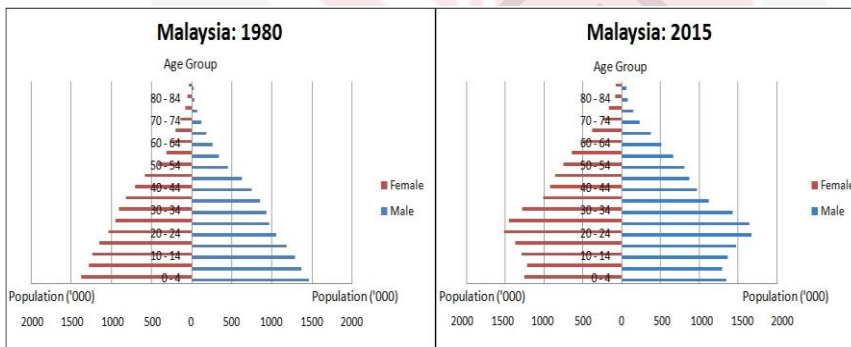


Figure 1.9: Population Distributions for Malaysia in Year 1980 and 2015
(Source: DOSM)

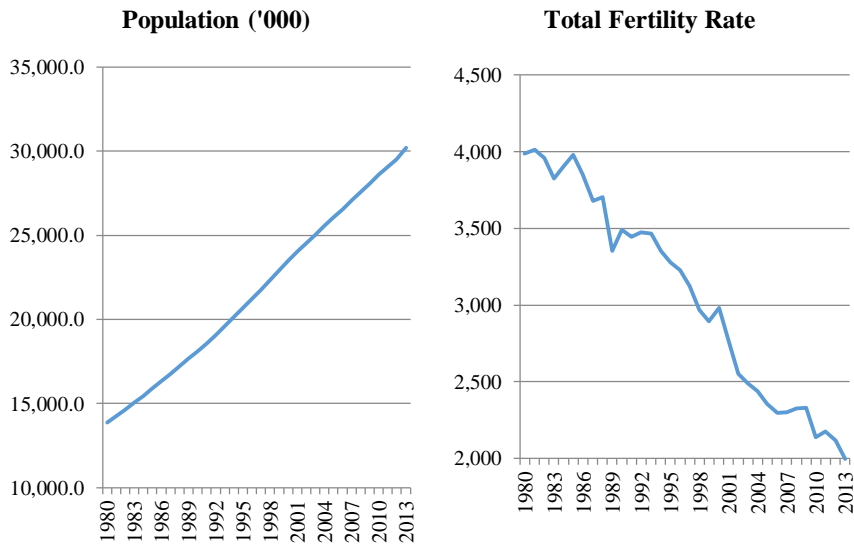


Figure 1.10: Malaysia Population and Total Fertility Rate 1980 - 2013
(Source: DOSM)

Besides, housing price is closely associated to inflation rate. Inflation rate can be measured by consumer price index (CPI). Housing price is one of the major components in the basket to compute CPI as it is part of the largest expenses in household expenditure. Figure 1.11 shows the components of household expenditure in Malaysia in 2014. From the figure, housing expenses were combined with fuel and power consumption which comprise 24% in overall household expenditure. CPI is also computed based on these components and its weightage. Figure 1.12 shows the national housing price on the left axis and CPI (base = 2010) on the right axis from year 2010 to 2014. Similarly, with population, CPI also increases steadily from year 2000 to 2014 and did not follow the faster pace of house price since year 2008. Overall, both components exhibit upward trend throughout the period.

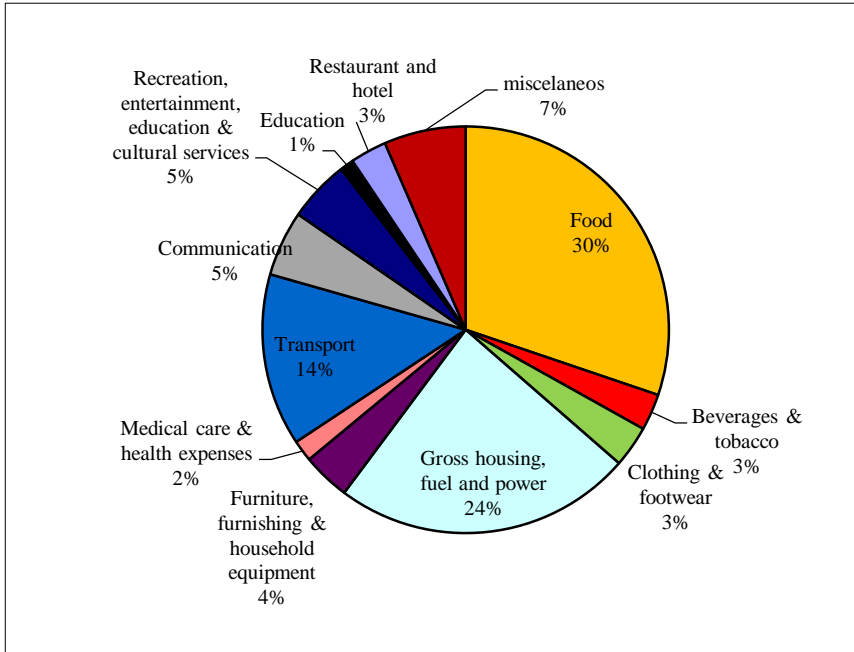


Figure 1.11: Household Expenditure in Malaysia 2014
(Source: DOSM)

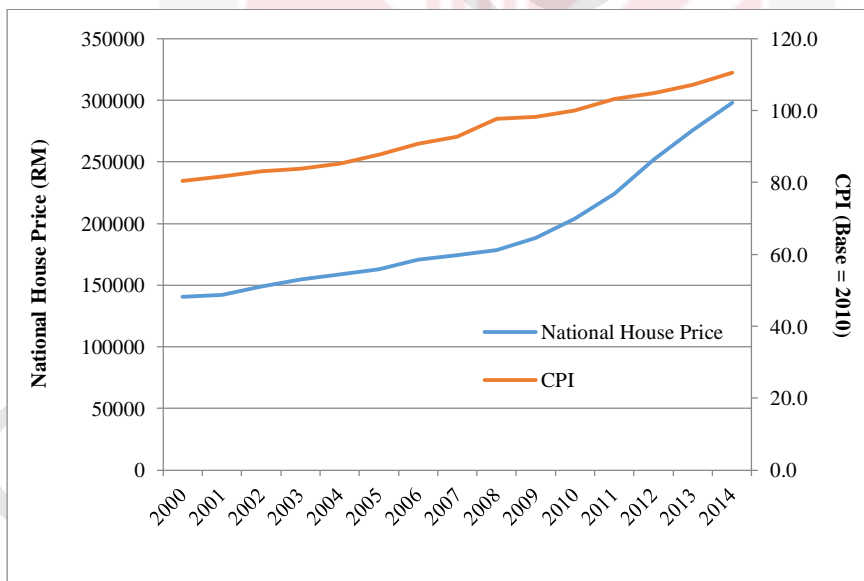


Figure 1.12: National House Price and CPI (Based = 2010) in Malaysia 2000 to 2014
(Source: IMF & JPPH)

Lastly, consumption is another important macroeconomic factor that is associated with housing price. Generally, the housing price affects consumption through wealth channel. Higher housing price will be transformed into wealth and to household through financial system, for instance, equity withdrawal from bank or invest in housing related securities. Notably, housing price may cause a negative impact on consumption, whereby higher housing price will reduce spending for potential buyers to save more in order to purchase a higher priced house. Figure 1.13 shows the aggregate housing price and household consumption in Malaysia from year 2000 to 2011. Both housing price and consumption show an upward trend throughout the period.

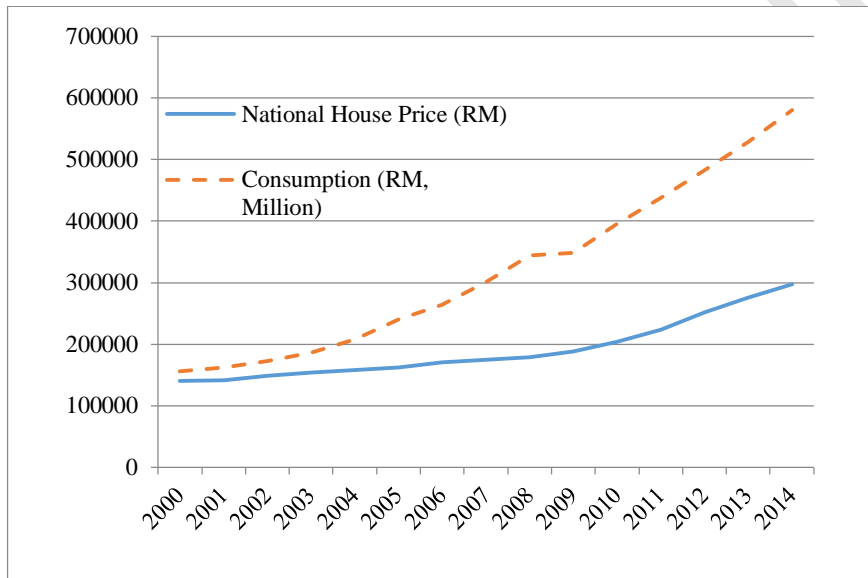


Figure 1.13: National House Price and Household Consumption in Malaysia 2000 to 2014

(Source: IMF & JPPH)

1.4 The House Price Determinants

Housing price vary according to characteristic of house. Land area, build up area, number of rooms, location, and many other characteristics will determine the price. For instance, bigger land and build up area would be more expensive than those smaller ones, holding other factors constant. In an economical point of view, housing price is influenced by income, population and age group.⁷ In a more recent study, investment and speculation factors were included into housing price determinants due to housing its similarity to other financial assets. (Morley and Thomas, 2011; Mikhed and Zemcik, 2009; Chen et al. 2007)

⁷Similar suggestion can be found in Holy and Jones (1997).

The foundation of the housing price is complex. The first consideration is the demand factor of housing. Demand mainly is determined by some fundamental elements, such as income and population. Holly and Jones (1997) emphasized the role of income in term of demanding a house. Without sufficient income, individual will face difficulty during loan application in purchasing a house. Owning a house is a goal for many people, but buying a house is totally different from buying goods due to its price. It is a life time commitment for most of the people and will take 15 to 40 years to repay the mortgage loan (Malaysian context). For instance, a house which is worth RM300,000 will need roughly RM40,000 as the upfront cost⁸, and RM1,348 monthly repayment⁹. Thus, a household must reach certain income threshold to reach the goal.

Other than income, population will affect the demand. The idea is that the capacity of a house no longer satisfies the members when there are new members in a house, through marriage or new born. Thus, a new house is needed, either rent or buy. In a macro perspective, population density will act as a proxy of population to determine house price together with the income. So, it is not surprising that the high density states, such as Kuala Lumpur, will have a higher level of price if compared to low density state, such as Kelantan. The housing price factor can be more complicated if demand is taken for investment (rent) and speculation. Housing price acts as an investment and speculation asset. In addition, the increasing trend of housing price in Malaysia attracted a lot of investors, speculators, as well as the hedger who demand store of value, both from domestic and foreign.

Increasing housing price should support by increasing income. In reference to Figure 1.7, the graph shows there is an opposite movement between GDP (income) and housing price; housing price increase while income reduces. Therefore, the housing price may be caused by factors other than fundamentals factors. First consideration would be speculation, when speculators obtain capital gain by trading housing unit in short term, inflation occurs in housing price and this forms housing bubble.. This is the common explanation when increasing housing price is not followed by income. (Mikhed and Zemcik, 2009)

Other than speculation, another possible reason would be foreign inflow. Foreign inflow is defined as foreigner purchase housing units in Malaysia, regardless of the purpose. Foreigners purchase housing unit will bring in money from their country, thus may distort the relationship between fundamentals factors and housing price in local housing market.

Buying a house in Malaysia is not a complicated matter. According to Mohamad (2007), Malaysia government has loosen housing restriction on foreigners and has

⁸ Standard upfront costs consist of 10% down payment, legal fees for sales and purchase agreement and loan agreement.

⁹ The monthly repayment calculated based on 4.6% annual interest rate, 30 years repayment period and exclude mortgage insurance.

provided various incentives to attract foreign buyers through Malaysia My Second Home Program (MM2H). Foreigners must purchase a residential property worth RM 1,000,000 and above. On the other hand, foreigners consider this to be a moderate amount. Tillmann (2013) commented that the rising price was caused by the foreign inflow. In reference to Figure 1.14, houses which were purchased by foreigners was recorded. Overall, foreign purchase shows an uptrend which is from RM588 million in 2005 to RM1.87 billion in 2015 and highest record hit RM2.96 billion in year 2014.

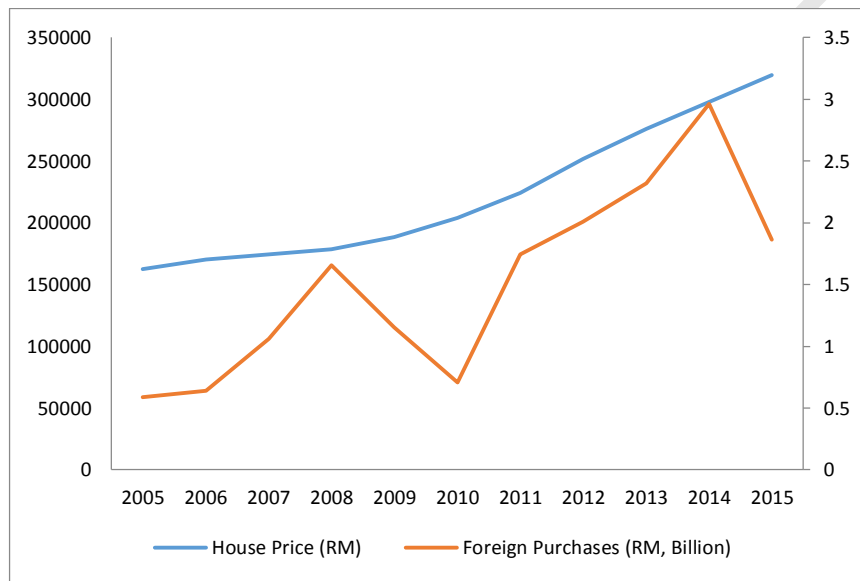


Figure 1.14: Foreign Purchases and Aggregate House Price 2000 - 2015
(Source: JPPH)

Both housing price and foreign inflow showed uptrend, therefore, it is feasible to consider the suggestion of Tillmann (2013), whereby housing price may be caused by the foreign inflow. Figure 1.14 showed unconvincing statistics from 2008 to 2010. In 2008, the turning point of the foreign inflow and the transaction value dropped from RM 1.7 billion to RM 707 million in 2010, and at the same time housing price started to grow at a faster pace. In addition, foreign inflow is also reduced in 2015 from RM2.96 billion to RM 1.86 billion, but there is no sign of decrease in housing price. Therefore, this posted a question regarding the impact from foreign inflow; is foreign inflow or speculation is the culprit of causing high housing price?

1.5 The Impacts of House Price

Housing as a necessity with no close substitution and everyone need it as a shelter in order to survive. There are two ways to own a house: rent or purchase. But both have to pay a significant cost due to the expensive price. Therefore, household is normally the party that being impacted most from consequences of increasing

housing price. In addition, homeownership in Malaysia stood at 59% in year 2010 (Characteristics of Living Quarters 2010, DOSM). In other words, more than half of the population owning a house (asset) generated wealth to household as compared to other assets. Other than household, other parties will be various business sectors. The expensive house price is normally due to its broad inputs, especially the scarce resources: land. Therefore, business sector will prosper if there is high transaction of house, regardless new or existing houses.

Leamer (2007) tried to emphasize the role of housing cycle in business sector. The author concluded that both housing and business cycle led by consumers' housing and durable goods purchasing behaviour, and most of the time housing market slumped is followed by economic downturn and vice versa. The author also explained that one of the reasons of such finding is the complementary relation between housing construction and durable goods manufacturing, whereby demand for housing units decrease while resilient demand will decrease.

In a more specific perspective, housing market may impact the economy through various channels. There are several studies which used multisector perspective to explain the spill-over of housing market. Housing construction employ labours, land capital and intermediate input (Davis and Heathcote, 2005; Iacoviello and Neri, 2008). Davis and Heathcote (2005) combined construction, manufacturing and service sector to jointly produce final product for consumption such as business investment and residential investment. The results showed that there are positive co-movement between consumption, GDP, residential investment and non-residential investment when immediate goods (or labour) were used.

The process is complex since housing production and marketing process involve many parties. According to Abdullah et al. (2011), new project development begins with predevelopment stage, the construction stage and then the post construction stage. Various types of goods and services were demanded throughout these stages. For instance, throughout the planning of development, services such as legal advice on the land usage and acquirement, building and structure design from architecture and interior design, material planning from quantity surveyor, financing service from financial institution and more are needed. In the second stage, the construction started. Construction process demand inputs such as labour, capital and materials to produce the final output. Lastly, the post construction stage requires services from property negotiator to market the housing projects, banking and insurance service for owner. The whole process ends once the property is handed to a respective house owner.

Therefore, the biggest impact is on the household since they bear all the cost of housing construction. This impact will alter various household decisions such as expenditure and fertility. Klyuev and Mills (2007) and Ebner (2013) found that increase of housing price encourages expenditure thus reduces saving in order to achieve a desired wealth level. On the other hand, Ledger (2009) and Hui et al. (2012) suggested that the increase in cost of living particularly from housing cost has caused couple to reduce the number of desired children. Both decisions will

impact the economy as a whole and these aspects will be investigated in to following sections.

1.5.1 Household Consumption and Housing Wealth Channel

As mention earlier, housing is one of the biggest assets for most of the household and house acts as financial assets due to financial innovation. Housing wealth is defined as capital gain and rental return from the house value; higher price will lead to higher capital gain and rental return. Household may not own other financial assets like bond and stock, but most of them own a house. Therefore, the wealth that is generated from house may outweigh other financial assets and increase spending. By looking at the other perspective, housing price increase indicates that the expenses on housing also increased. Since house is necessity and no substitution, this will burden the household, especially those who do not own a house; they have to buy or rent at a higher cost. From this example, the impact of housing price on household consumption remains uncertain and worth to study as household contribution is the largest share of GDP. Thus, in this section, the limelight will focus on housing wealth perspective.

Figure 1.11 shows the expenditure of a typical household in Malaysia in the year 2014. The chart show that the housing expenditure is the second largest component after food. A typical household expenditure is about quarter of its income on housing, and these expenses is considered to be anautonomous expenditure because it is an essential need. . In other words, if the housing price increases while income remains constant, household must reduce other non-autonomous consumption. Therefore, any changes in housing price will affect the household' wealth and consumption greatly.

Figure 1.15 presents the growth of consumption, growth of house price and the growth of income. Notably, there are 2 abnormal housing price changes from year 1995 and 1997. According to Bank Negara Malaysia (BNM)'s publication¹⁰, the growth in 1995 was caused by the strong domestic demand and large capital inflows, while the plunge in 1997 was caused by the Asian Financial Crisis (AFC). Figure 1.10 shows the income growth from 1993 to 1997 is at an astonishing pace which exhibits approximates about 10%.Moreover, the aspect of income declined sharply during the AFC. After that, it experienced a fluctuated growth rate ranged from -3% to 15% before it plunged again in 2009. Overall, the movement of all three components is closely related.

¹⁰ Bank Negara Malaysia Annual Report 2010. For more information, visit: http://www.bnm.gov.my/files/publication/ar/en/2010/cp01_003_whitebox.pdf

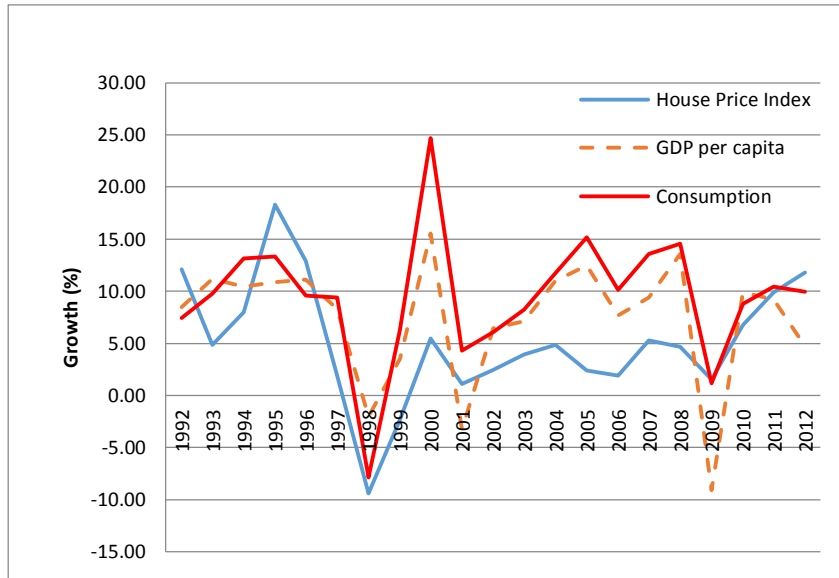


Figure 1.15: Consumption Growth, House Price Growth and Income per Capita Growth 1992 - 2012

(Source: JPPH)

Housing not only provides shelter nowadays, it also serve as an investment asset which brings return from rent and capital gain. Thus, increase in housing price will provide capital gain as well as higher rent; investors increase housing wealth. Besides, investors will spend the wealth which gained from the housing market, thus this will increase domestic consumption. Thus, housing wealth is defined as the source of income generated from capital gain and yield from house, which will induce spending or consumption. This housing wealth channel is proven by plenty of researches whose work has been done in developed countries (Muellbauer and Murphy, 1990; Dvornak and Kohler, 2007; Carroll et al., 2006).

Generally, housing wealth which came along with higher housing price is not realised. In order to realize the housing wealth, house owner need to sell the house or approach financial institutions to refinance or withdraw the mortgage equity. For instance, a homeowner purchased a house worth RM 100,000 and with an outstanding loan of RM90,000 (90% financing margin of house price). Assume that housing price increased from RM100,000 to RM 200,000, the home owner are allowed to borrow or withdraw until RM180,000 (90% financing margin of new house price) from bank and an addition of RM90,000 from existing loan. Therefore, an additional RM90,000 referred as housing wealth and homeowner may use these additional wealth to spend on anything they want, thus this increases consumption. Higher consumption will lead to higher aggregate demand while stimulating the economy. In addition, due to the financial innovations, there are also financial instrument in which its price and return is associated with house price; MBS and REIT. MBS provides return to the holder based on the cash flow from the housing loan repayment. Similarly, REIT is a trust fund that provides cash flow from the real estate lease repayment, but majority of the asset is a commercialized real estate. All the returns from both MBS and REIT also refer to

housing wealth. Thus, house owner obtain housing wealth from selling the house, refinance while MBS increases spending.

Malaysian mortgage security markets are relatively small due to the immature market. According to Cagamas Annual Report 2014, Malaysian MBS was first introduced in year 2004 with the issuance which is worth RM1.56 billion, and the outstanding MBS which is worth RM5.06 billion (0.5% of GDP) in 2014. It is relatively small if compared to developed countries such as US, whereby the outstanding MBS is worth \$2,748 billion (15.78% of GDP). In another word, these somewhat imply that Malaysian investors still have less interest on MBS as compared to US, therefore, the impact of wealth withdrawal from MBS maybe lesser if compared to other channels.

Refinance is a common way to withdraw the housing wealth from housing price appreciation¹¹ in Malaysia. Refinance or reinstatement refers to further increase in the amount of existing loan. Homeowner has to go through the bank credit assessment again as well as paying the legal and valuation fees if the loan is approved. By looking at these characteristics of Malaysian markets, it is obvious that the house owner face more barriers to withdraw or generate wealth from housing market. Therefore, positive relationship between housing wealth and consumption maybe weaker than expected in Malaysia. In addition, if the price effect takes place, consumers who are yet a homeowner may save more in order to purchase a house in the future, since the upfront cost of housing purchase is associated positively with house price thus reduced consumption may not benefit the economy.

Nevertheless, a clearer picture of how housing price affect consumption through housing wealth channel is needed in order to assist government on housing policy. The effect of policy may not be able to reach its target if housing wealth channel is omitted and it may harm the economy if there is an adverse effect.

1.5.2 House Price and Fertility

In biology or religion, giving birth is part of the nature and the purpose is the continuation of life. It is one of the main tasks of human to ensure the survival of its kind. Although this process seems legit to the nature for mankind, but it is not so simple after all. Giving birth is one of the biggest events for every mankind, and this is supposed to be prosperous. But due to several reasons such as war, poverty, natural disaster, social and economy condition the change on viewpoint occurs.

¹¹According to Hui (2009), mortgage refinancing is one of the ways to withdraw housing equity (wealth) in Malaysia. For more information, see Hui (2009)

In reference to Figure 1.10, Malaysia is not facing a threat of depopulation at the moment, but the risk of population ageing that is illustrated in Figure 1.9 is imminent if the decreasing fertility problem remains unsolved. Therefore, it is important to understand the reasons of low fertility and identify the possible solution to prevent it.

Bongaarts (1978) explained the determinants of fertility scientifically, which was categorized under 4 major proximate determinants such as married proportion, contraception, induced abortion and lactational infecundability. The author suggested that the fertility is primarily affected by these determinants and this model can provide an insight on which socioeconomic variable is affecting fertility. In the perspective of socio economics, income, cost of living, female education and employment, urbanization, family planning, infant mortality, female employment and other factors contributing to fertility decision. (Panopoulou and Tsakoglou, 1999; Ledger, 2009; De silva, 2003)

In this study, the limelight will be on the perspective of cost of living, particularly housing cost and cost of nurturing a child such in aspects such as healthcare and education costs which consume a large portion of family income. There are plenty of studies which explained the relationship between housing price (cost of housing) and fertility, where some advocates housing price and fertility as an opportunity cost while other advocates housing price as complement. For instant, Chen (2013) claimed that Taiwan has the lowest fertility rate in the world because of higher housing price. Meanwhile in Hong Kong, high housing price always worries the middle and low income residents in Hong Kong which leads to a lower rate in bearing a child (Hui et. al, 2012). In contrast, Lovenheim and Mumford (2013) discovered that housing wealth channel increases fertility in United States. Higher house price benefits family through housing wealth channels and generate extra income for families, therefore family could afford children.

In Malaysia, this fertility issue is interesting due to the differences in terms of financial system and social economic structure. Malaysia has its own unique education and healthcare systems which are different with other countries, thus the components that affect fertility may be different. In addition, the increasing housing price within recent decades also explain the reducing fertility. Housing expenses is one of the major expenses of household, as well as one of the major costs of nurturing children. With limited resources, household may choose to let go of consumption or standard of living to raise more children, or to raise less children in order to maintain the standard of living and at the same time invest all the resources on less children to increase their “quality”¹².

In contrast, housing price may not reduce fertility in certain extent. Higher housing price may generate extra income for household through wealth channels. Housing price may increase wealth directly through housing wealth. Housing wealth generally came from either refinancing or through higher investment

¹² A “quality” child is defined as a healthy and educated child.

returns from housing related securities in both stock and derivatives markets. House owners will perceive themselves richer when their housing price increase, thus house owners have the capacity to have extra children. Therefore, wealth channel from housing market is able to increase fertility. Several studies discussed similar argument, such as Detting and Kearney (2011) and Lovenheim and Mumford (2011).

Figure 1.16 presents aggregate total fertility rate and house price index in Malaysia from year 1980 to 2013. From the figure, total fertility rate exhibits decreasing trend throughout the period; less children being born per 1,000 women. The number dropped from 4000 children per 1,000 women in year 1980 to 1994 children per 1,000 women in year 2013 with approximately 50% drop throughout the years. On the other hand, housing price index increased drastically from 49.32 in year 1980 to 193.45 in year 2013 with approximate 292% increase throughout the years.

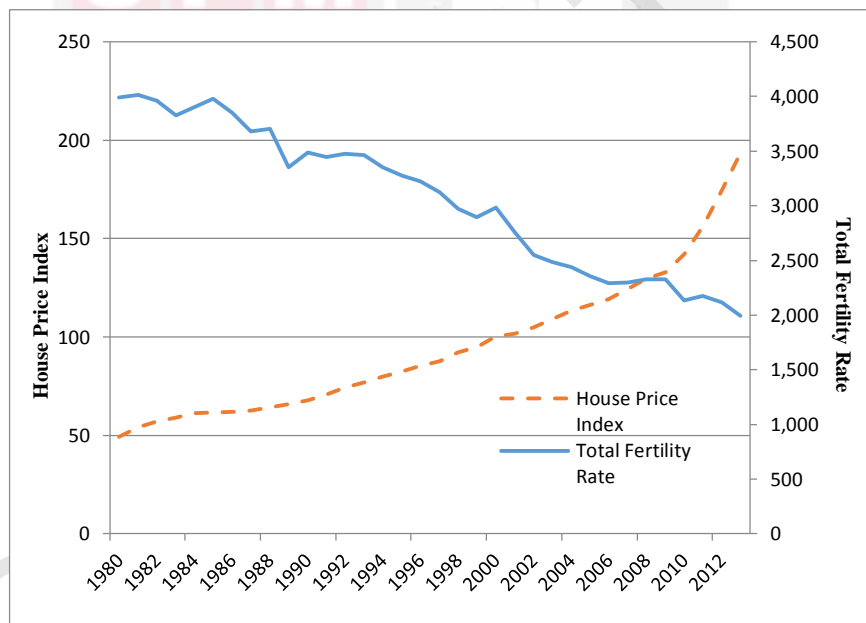


Figure 1.16: Total Fertility Rate and House Price Index (base= 2000), Malaysia 1980 - 2013

(Source: DOSM)

From Figure 1.16 shows an upward trend on house price index while total fertility rate decreases. These somewhat suggest there is negative relationship between housing price and fertility. Therefore, the limelight should focus on the increasing housing price and the decreasing fertility, along with other fertility components such as education cost and healthcare cost, since this may cause aging population and depopulation problems.

Generally, education and healthcare cost are believed to be the most important factors in children's cost and the factors determining fertility. . But housing cost

shares the limelight generally affecting everyone in long term. For instance, once a couple purchase a house, they have to bear the housing loan for decades. For those who are yet to own a house couples have to work hard to purchase a higher priced house. Along with higher healthcare and education cost¹³, couples may delay marriage and are unable to bear more children, thus this leads to low fertility rate among younger generation. Therefore, the impact of housing price towards fertility is worth to examine and may contribute to the solution of decreasing fertility in Malaysia. The general factors that are affecting fertility have been discussed and the main focus of this study is housing cost (price).

1.6 Problem Statement

Figure 1.3 shows the Malaysian housing price from year 2000 to 2014. We can clearly observe there is an upward trend of housing price from 2003 to 2014. Within these 15 years, Malaysian economic has been impacted by few major crises, such as Asian financial crisis, sub-prime crisis and recently European and US debt crisis, but there is only a slump from year 1997 to 1999. But after that, the upward hike is continued from year 2000. Thus, the arising question is such as; what are the causes of these price increase? In order to answer this question we have to look at the most common factors¹⁴ which drive the housing price whereby housing demand, speculation, and foreign inflow, income and population are the fundamentals for housing demand. As discussed earlier, although the housing price and income (Figure 1.6) exhibit an increasing trend, when relationship is decomposed into growth rate this shows that they are moving in an opposite direction (Figure 1.7). Therefore, the housing price may cause by factors other than fundamentals factors. The first consideration would be speculation, whereby speculator obtain capital by trading housing units within a short term, thus this inflates the housing price and forms housing bubble¹⁵. Another possible reason would be foreign inflow, which flows from western countries to eastern country, especially after sub-prime and European debt crisis. Malaysia started to encourage foreigner to reside and purchase properties in Malaysia through Malaysia MM2H and this can be observed in Figure 1.14, but there is no relevant data regarding foreign ownership and inflow in terms of housing market in the study of Tillmann (2013)¹⁶. At the same time, income and population are equally increasing throughout the years and this may be another possible factors that support the housing price hike. Thus, there is a doubt whether Malaysian house price was driven by foreign inflow. Hence, what are the factors that increase housing price in Malaysia?

¹³ According to DOSM published price index, healthcare cost rises from 47.3% in 1980 to 133.52% in 2014. Education cost rises from 75.3% in 1980 to 117.91% in 2014. Both indexes are based at year 2000 level.

¹⁴ Most of the studies use housing demand as fundamentals of the house price, speculation and foreign inflow as other determinants, such as Holy and Jones (1997), Xiao and Park (2009) and Stepanyan et al. (2010).

¹⁵ This is the common explanation when increasing house price is not followed by income. (Mikhed and Zemcik, 2009)

¹⁶ Tillmann (2013) uses the sum of foreign direct investment, portfolio investment and other inflows as the proxy for foreign inflow. These data were unable to reflect the foreign inflow in housing market.

Housing price determinants vary according to area and state. For instance, a 20x70 feet intermediate double storey house is sold for RM 220,000 in Ipoh, Perak, but the price for a similar house is double/triple in Kuala Lumpur or Petaling Jaya. This may be due to a difference in housing demand, such as different income, population and job opportunities level. Besides, the speculation and foreign inflow may not have been evenly distributed among states. . In another word, different states will have different level of housing speculation and foreign inflow due to the choice of speculators and the destination of foreign inflow, which depends on their perceived level of profit. Therefore, this analysis shall consider the regional impact as well.

In there are various determinants of housing price, but it is unclear which determinant will affect Malaysia's housing price significantly. If the housing price is not supported by income or caused by speculation factor and has no proper control, bubble may form and explode. In addition, foreign inflow which is brought in by foreign purchaser also may cause a recent hike in price, and this will post more questions regarding which factors are responsible in determining the price. It is important to make this clear in order to prevent a potential economic crisis, for instant an appropriate policy should be provided as soft landing. An important lesson from sub-prime crisis homeowner, investor, and government as well as the central bank is the underestimation of the impact of housing market. Housing market impacts an economy in various channels and the focus covers the household perspective.

It is worth to look at the impact of housing price on household since it is the largest spender in the economy. By looking at the buyer's (or household) perspective, before buying a house, they have to prepare (or save) certain amount of fund to pay during the transaction process. After the buyer obtains the house, they have to renovate the house and purchase furniture. . At the same time, loan repayment started would have been started. So housing price will affect the consumption behaviour. But most of the existing consumption theories exhibit that housing price affects consumption positively via housing wealth channel. Most of the studies (Lettau and Ludvigson, 2004; Case et al., 2001; Chen, 2006)¹⁷ were conducted in advanced country which are equip with a high level of financial freedom; unlike Malaysia, a developing country is governed by severe financial regulations.

Household particularly refers to one who owns a house regardless of the purpose of owning a house. , will benefit from rising house price. When housing price increases, house owner will feel wealthier and they are able to withdraw extra money through mortgage equity withdrawal and this increases expenditure. But this scenario may not happen in Malaysia due to the firm authority of the central bank. In addition, derivative market in Malaysia has a short history and is

¹⁷ Lettau and Ludvigson (2004) studied US, Chen (2006) studied Sweden, while Case et al. (2001) studied 14 developed countries, namely Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom and US

relatively small as compared to western countries. Mortgage backed securities has yet to obtain attention from most of the investors therefore there is lesser channel to realise the housing wealth. Hence, the housing wealth channel may not benefit the growth as those developed countries. In the worst scenario, negative wealth will reduce consumption when the housing price increases. From the data retrieved from DOSM in 2014 (Figure 1.9), 24% of the consumption of a typical consumer goes to housing. Hence, the hike in housing price is a problem since it consists of a big portion of a typical consumer's budget, especially those who do not own a house. Nevertheless, the recent rocket speed of hiking price in Malaysia raised concern among everyone: will this increasing housing price benefit the economic growth through housing wealth channels? On the other hand, housing policy is one of the policies which allows the government to manipulate the economy. The study of relationship between housing wealth and consumption will assist government to predict inflation as well as aggregate demand. Thus, the housing wealth channel should be re-evaluated in the context of Malaysia in order to form an appropriate policy to monitor the economy.

Other than household consumption, housing price maybe productive. As mentioned in the previous sections, Malaysia has experienced a drastic dropped in fertility rate (Figure 1.10) and there is lesser population (Figure 1.9). There are two channels that housing price can affect fertility. First channel would be cost of bearing of children. Housing price is perceived as one of the major expenses of household, whereby higher housing price may impose higher cost to bear children, thus this leads to lower demand of children (Becker 1992). Second channel would be wealth channel. Housing price is perceived as a source of wealth in which higher housing price lead to higher wealth, thus couples able to afford more children (Lovenheim and Mumford, 2013).

In modern era, family size has been reduced due to various reasons, both scientifically and economically. Fertility is always associated with cost and standard of living, especially in terms of housing, education, medical and other child bearing expenses. Increasing cost of living is a common problem in most developing countries. Malaysia as a developing country is inevitable to these problems especially due to the sky rocketing housing price in recent years. This may outweigh other factors to reduce fertility. In contrast, housing price may also affect fertility through housing wealth channels, whereby higher housing price may increase housing wealth in households, thus couples are able to afford additional children. Therefore, higher housing price may impact fertility both positive and negatively, so how housing price affect fertility in Malaysia?

In a nutshell, there are three issues which will be investigated; firstly, the determinants of housing price remaining uncertain. Second, the impact of increasing housing price is consumed through housing wealth remains unknown, and lastly, the relationship between fertility and housing price is vague. Household consumption and fertility play an important role in an economy, whereby household consumption contributes on GDP while optimal fertility ensures the sustainability level of population. Nevertheless, there are few questions which arouse; the upward trend of Malaysian housing price is driven by foreign inflow,

speculation or due to the increasing in housing demand? What is the impact of rising housing price towards Malaysian household in terms of consumption and fertility?

1.7 Objectives

In order to answer the questions, this study aims to examine the determinants of housing price, as well as to test the impact of housing price in the household consumption and fertility decision. In summary, this study intends to:

- 1) Identify the determinants of housing price by using state level data.
- 2) Analyse the role of housing wealth channel in household consumption.
- 3) Examine the impact of housing price in determining fertility.

1.8 Significant of Study

This study seeks to examine the housing market from price and household perspective. This will provide a clearer picture on which factors drive the recent increasing house price. Ultimately, the impact of the hike in price will identify the household consumption channels and various economic sectors. There are some similar existing studies done in Malaysia, but there are rooms for improvement. Tillmann (2013) used portfolio investment and foreign direct investment in balance of payment as proxy to study the relationship between house price and foreign inflow. Portfolio investment and foreign direct investment is less appropriate due to less involvement in housing market. This study will utilise foreign housing purchase data obtained from JPPH to represent foreign inflow, therefore the results will reflect the foreign inflow in a better manner.

In addition, this study is among the first that utilised the state level data of foreign housing purchase as foreign inflow proxy to determine house price. Notably, housing market is segmented, by using aggregated data as this somewhat will ignore the regional effect; thus, it is beneficial to look at the disaggregated data to have a clearer picture on the regional housing market. These will lead to several benefits to house buyer, investor, and government. For house buyer, a clearer picture of how housing price is determined will contribute in making a precise decision.. For instant, if speculation forces enter the market, the best strategy is to delay the buying decision. This is because buying it when the speculation forces retreat is to prevent capital lost. In addition, by knowing which factor is most significant towards housing price, investor also can make a better investment decision by observing it.

Besides, government should be able to obtain a clearer picture of the household behaviour in housing price changes and the causes of housing price changes. Notably, housing market is a double edged sword; therefore, it is necessary to

understand the market before taking an action. The government should be able to benefit from the policy perspective. Firstly, if the results show the correct direction of how housing wealth affecting consumption, government will implement an appropriate policy to boost economy growth. If negative relationship is detected, government should lower the housing price in order to boost consumption and to reduce negative housing wealth.

On top of that, the impact of housing market is from different channels. Therefore, the policy has to consider together the aspect of fertility as well. From this study, the relationship between housing price and fertility may provide an insight on the issue of decreasing fertility that seems to be threatening Malaysia in the near future. Fertility is closely related to housing expenses and children expenses which will lead to a different degree of impact to the overall fertility. Thus, government may make a precise decision from the findings of this study by comparing the pros and cons of the policy intervention. If the decision is to intervene into the housing market, government knows the ways to control this intervention when the housing price are identified.

This study will examine the impact of the housing market to household sector, thus it can provide a clearer picture on how to affect household by using housing policy, as well as provide a hint that housing market should be closely monitored to prevent possible negative domino effect.

1.9 Organization of the Thesis

This thesis comprises of five chapters. Chapter 1 provides an overview of Malaysian housing market and its issues. Chapter 2 reviews both theoretical and empirical studies which was done by various researchers in the related field.. Theoretical frameworks, model specifications and statistical methods employed in this thesis will be discussed in Chapter 3, together with the model of specifications and source of data. Chapter 4 presents the estimated results, discussion and comparison of the findings with previous studies. Chapter 5 summarizes the thesis as a whole and highlights the findings and its policy implications.

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