STRATEGIES FOR AFFORDABLE HOUSING DELIVERY

By

LIM XIN YING

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Master of Engineering Science
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DECLARATION

I <u>LIM XIN YING</u> hereby declare that the dissertation is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UTAR or other institutions.

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(LIM XIN YING)

Date _____

APPROVAL SHEET

This dissertation entitled "**STRATEGIES FOR AFFORDABLE HOUSING DELIVERY**" was prepared by LIM XIN YING and submitted as partial fulfillment of the requirements for the degree of Master of Engineering Science at Universiti Tunku Abdul Rahman.

Approved by:

_____

(Dr. OLANREWAJU ABDUL LATEEF ASHOLA)

Date: ………………...

Supervisor

Department of Construction Management

Faculty of Engineering and Green Technology

Universiti Tunku Abdul Rahman

_____

(Ar. TAN SEONG YEOW)

Date: ………………...

Co-Supervisor

Department of Construction Management

Faculty of Engineering and Green Technology

Universiti Tunku Abdul Rahman

FACULTY OF ENGINEERING AND GREEN TECHNOLOGY

UNIVERSITI TUNKU ABDUL RAHMAN

Date: 27th February 2019

SUBMISSION OF DISSERTATION

It is hereby certified that *Lim Xin Ying* (ID No: *15AGM02310*) has completed this dissertation entitled "STRATEGIES FOR AFFORDABLE HOUSING DELIVERY" under the supervision of Dr. Olanrewaju Abdul Lateef Ashola (Supervisor) from the Department of Construction Management, Faculty of Engineering and Green Technology, and Ar. Tan Seong Yeow (Co-Supervisor) from the Department of Construction Management, Faculty of Engineering and Green Technology.

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ABSTRACT

STRATEGIES FOR AFFORDABLE HOUSING DELIVERY

Lim Xin Ying

The provision of adequate and affordable housing is a concern for governments globally. The Malaysian government has introduced various schemes, policies and regulations to assist the supply and demand of affordable housing in Malaysia. The pricing of a house had greatly influence many factors such as developers' profit margins and revenue. Affordable housing should be reasonably priced for the middle-class society, but the current "affordable housing" is unaffordable to the most. Therefore, this research aims to develop a framework to deliver affordable housing. To achieve the research aim, the research objectives have been set to analyse the factors causing the Malaysian housing prices to increase, to analyse the extent of availability of construction materials and to analyse the factors determining the demand for affordable housing. This research was carried out through two different cross-sectional questionnaire surveys, which involved the housing industry experts and home users. There were 115 housing industry experts and 529 home users involved in this research. The questionnaires were

administered by hand. The findings based on the housing industry experts, showed that the Kaiser's measure of sampling adequacy (MSA) indicated the strength of the relationships among the causes as strong (MSA=0.720). The Bartlett's test of sphericity, was significant ($x2$ (210) = 1438.685, $p<0.001$), indicated that the data drawn from the same population and the causes were related to one another. Using the principle component analysis, all the 21 causes were grouped into seven factors. The findings for the unstable supply of construction material during construction is at low risk. On the other hand, the findings from the home users using the Kaiser's MSA indicated that the strength of the relationships among the causes was acceptable (MSA=0.518). The Bartlett's test of sphericity, was significant ($x2$ (210) = 10953.982, $p<0.001$), indicated that the data drawn from the same population and the determinants were related. Using principal component analysis, all the 21 determinants were grouped into six factors. In conclusion, all the information will become a guideline for the strategy of the policymakers, urban planners, developers, homebuyers and contractors to deliver affordable housing in the future.

Keywords: Affordable Housing, Factor, Supply, Demand, Malaysia

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CHAPTER 1

INTRODUCTION

1.1 General

The concept of affordable housing is used to address the low- and medium-income housing problems around the world. Housing affordability is a concept that interprets socioeconomic and development environments. Affordable housing thought about the decision making on non-housing and housing product, expenditure by household (Samad et al., 2016). Therefore, if a homebuyer allocates thirty per cent of their gross monthly household income to buy a house, the property price is considered reasonable. The Department of Housing and Urban Development in United States (HUD, 2003) defined that families who pay over thirty per cent of their household income for housing might experience difficulties to satisfy their basic needs like transportation, food, treatment, and vesture which regarded as cost-burdened. In Malaysia, many households cannot afford their house because housing price outstripped inflation. It was reported that the housing price in Malaysia experiences an annual increase of approximately six per cent (The Star, 2017). Therefore, this research aims to investigate on affordable housing in

Malaysia in an effort to develop a framework to facilitate an affordable housing delivery.

The focus of this thesis is to develop a framework for affordable housing delivery. The framework comprises of an overview, broad summary, or skeleton of interlinked items that supports the approach to a selected objective, and is a guide that may be changed by deleting or adding items (Business Dictionary.com, 2018). The thesis is organised into six chapters, namely, introduction, literature review, research methodology, data analysis and results, discussion of findings, and conclusion. Chapter 1 sets the background of the research. This chapter describes the problem, aim and objectives, and also the significance of the study. The chapter concludes with an illustration of the research outline.

1.2 Background of Study

The shelter is a necessity. The provision of adequate and affordable housing is a concern of governments globally. The commitments of the government towards providing affordable housing to all Malaysians are impressive. The government provides affordable and low-cost housing to encourage greater ownership possession among the 'bottom 40 per cent households group based on the median monthly income' (Olanrewaju et al., 2016). In 2020, it is expected that more than 70 per cent of Malaysians will live in urban cities.

National Transformation Programme (2012) reported that Kuala Lumpur is predictable to accommodate another million residents in 2020 (Olanrewaju et al., 2016). Due to the rapid growth in migration, increase in foreigners on expatriate, tourists and students, population, change in lifestyle, dilapidation of the existing stock and the changing of economic status of the citizens, housing requirements are predictable to remarkably increase (Olanrewaju et al., 2016). This will affect the low – medium, medium cost and high cost people. Housing demand for the low cost and poor will remain, but the importance will be focused on delivery of vibrant housing that is adequate with the country's status (Olanrewaju et al., 2016). To cater the housing demand, the government has embarked on the provision of affordable housing.

Affordable housing means different meanings to different people. However, the basic principle of affordable housing is the same as it is considered that a household will not spend more than 30 per cent of their income for the housing loan or rental (Samad et al., 2016). The aim of affordable housing is to provide the low- and middle-income household the adequate, affordable, quality housing and related facilities. Though 'affordable housing' has many meanings and interpretation, it is largely the same. But one basic trend that is common to all the different definitions is that it is a measure of the affordability of houses in the low- and the middle-income earners. The primary factor that is used to determine the affordability of homes is the disposable income of the household. To interpret,

affordable housing is the housing that is priced below the median income of the society. In Malaysia, the median monthly salary is RM5,228 (Department of Statistics, 2017). Based on this common standard which is widely accepted, affordable housing should cost less or equivalent to three times annual median income. On this basis, the housing in Malaysia are one of the most expensive in the world.

Singapore implements public housing as their affordable housing. There are more than one million flats. The Singapore brand of public housing is remarkably unique. The flats spell home for over 80 per cent of Singapore's resident population, of which, about 90 per cent own their home (HDB, 2017). In providing housing, the Housing and Development Board takes a gander at the entire spectrum of necessities for an ideal living environment for residents. It is a persistent procedure to create vibrant, innovative, and sustainable communities, and they generally strive for excellent outcomes (HDB, 2017). Besides, the Housing and Development Board plans and develops public housing towns that furnish Singaporeans with quality living environment and homes. In this exertion, they take part in active research and development work to ensure that cost-adequacy and quality standards are maintained and continually improved upon (HDB, 2017).

United Kingdom affordable housing includes affordable rented, social rented and intermediate housing, provided to specified eligible households whose

needs are not met by the market. It can be a private sector property or a new-build property that has been acquired for use as an affordable home (Ministry of Housing, Communities & Local Government, 2013). In 2017 to 2018, 47,355 units of affordable homes were delivered in England (Ministry of Housing, Communities & Local Government, 2018). The aims of the Affordable Homes Guarantees programme in the United Kingdom are to help the economic growth, maximise the delivery of the new affordable housing supply, address the housing needs at a local level and ensure that the public funds and funds generated from conversions are effectively and properly spent (Homes and Communities Agency, 2013).

Hong Kong implements public rental housing for affordable housing delivery. Public rental housing is the Hong Kong government's housing strategy for low-income household that could not afford to rent a private accommodation (Hong Kong Housing Authority, 2012). The Housing Authority gives homes for more than two million residents, or about 30 per cent of the population in Hong Kong. In Hong Kong public rental housing portfolio, there are more than 780,000 flats. Public rental housing aims to create a harmonious and pleasant living environment for every one of its tenants (Hong Kong Housing Authority, 2012).

The population in Malaysia is increasing. In 2010, the population was only 28.59 million, while in 2018, the population increased to 32.44 million (Department of Statistics, 2018). From 2010 to 2018, the population increased about 14 per cent.

Malaysia aims to be a fully-developed country by 2020. The estimated population in 2020 is 33.8 million (Department of Statistics, 2018). The total supply of residential units in 2017 was 5,428,493 units (NAPIC, 2017). As a major interpretation of the above statistics, there are six people per house. This is considered high for a typical house in Malaysia with two to three bedrooms.

In order to increase the housing stocks and homeowners, the government has introduced many measures, including schemes, programmes, and policies. These measures include PR1MA (Perumahan Rakyat 1Malaysia), MyHome, RMR1M (Rumah Mesra Rakyat), MyDeposit Scheme, People's Housing Programme, Housing Loan Scheme, RMM (Program Rumah Mampu Milik), and Rumah Transit or transit house programme. The government also provided homebuyers, developers and contractors the subsidies and tax reliefs. The government also has relaxed the Employee Prudential Fund (EPF) regulation to allow contributors to use part of their savings to pay the down payment for the house. Developers offer split payments and discounts to homebuyers. The developers, such as REHDA, also offer 'bridging' loan to homebuyers due to the reduction in loan approval rate (Olanrewaju and Tan, 2017).

Malaysia faces housing affordability issue due to the slower household income growth and the supply-demand mismatch (Cheah et al., 2017). Financial support continues to supply for purchases of homes for entitled borrowers. Over 70

per cent of the housing loans are given to first-time consumers and shut to simple fraction of recent housing loans guided in the acquisition of homes below RM500,000 (Cheah et al., 2017). With the housing market in Malaysia, the structure, provided with the aspect associated with alternate factors, has resulted in an exceedingly letdown of the housing market to provide a suitable affordable housing supply for the plenty. On the demand aspect, the increase of housing value is rapider than the expansion in household income. The majority of Malaysians are low household earners, and a cultural preference prone to home-ownership rather than rent, causing the high demand for house buyers (Cheah et al., 2017).

1.3 Problem Description

The housing supply within Malaysia are severely unaffordable (Demographia, 2016). The government has proposed schemes, programs, and incentives for developers, contractors, and homebuyers. The prices of the houses continue to increase and the satisfaction levels of the homebuyers is not increased comparatively. In a study conducted by Olanrewaju et al. (2016), it was reported that most households in Malaysia spent over 30 per cent of household income to own or rent and operate their homes. In terms of index, the housing price have inflated by 1.86 from 2009 to 2016 whereas that of the high rise is a lot severe with an increase of 2.12 within a similar period (NAPIC, 2017). Therefore, there is the need to provide an answer to why housing prices are increasing in Malaysia. There

could be multiple reasons for the increase in the housing prices. Part of the problem could be accountable to developers, contractors, government policies, and third-party agencies. In this study, the causes of the property price increase are examined from the housing supply perspective. Understanding from the developer, material shortage causes a major increase in the house price. The extent of availability of construction materials should be analysed. Homebuyers seek adequate housing that they afford to purchase (Khazanah Research Institute, 2015). Homebuyers also consider factors such as good location of the housing with amenities, access to housing finance, a secure tenure and a degree of mobility and choice, when they look for a house (Khazanah Research Institute, 2015). Analysing the factors determining the demand for affordable housing will facilitate the decision-making in the housing delivery. Previous researchers have investigated the homebuyers' requirements, nevertheless, they have not focused on affordable housing and have not analysed the interaction between the requirements. Therefore, there is a need to know the factors determining the demand for affordable housing.

1.4 Research Aim

The aim of the research is to develop a framework to deliver affordable housing.

1.5 Research Objectives

To achieve the above aim, the following objectives have been set:

1. To analyse the factors causing the Malaysian housing prices to increase

2. To analyse the extent of availability of construction materials

3. To analyse the factors determining the demand for affordable housing

1.6 Research Limitation

"As many as you might want to, you cannot study everyone all over the place doing the whole thing" (Osipova, 2008). The research focuses on two main groups of respondents. On the supply side of the housing industry experts are the developers, contractors, sub-contractors, engineers and architects, while on the demand side is the home users.

1.7 The Significance of the Study

The significance of this research is to propose the strategies for affordable housing to the involved parties because this research analyses the factors causing affordable housing prices to increase and the factors determining the demand for affordable housing in order to get the review from the homebuyers their view on the affordable house requirement. This is because the housing price increases rapidly in Malaysia, while the homebuyers could not afford to own a house based on their monthly income. Affordable housing is considered as that the household will not spend more than 30 per cent of their income for the housing loan or rental (Samad et al., 2016). In order to improve on affordable housing, the housing industry experts need to observe and view of the home user needs. This research expected the guideline would be able to lead the policymakers, urban planners, developers and contractors to minimise on the factors that causing the housing price to increase during delivery affordable housing. Besides, it also as a guideline for policymakers, urban planners, developers and contractors during decision-making on affordable housing development. Homebuyers also could understand the factors which cause Malaysia housing price to increase.

1.8 Outline of the Thesis

This thesis consists of six chapters. Chapter 1 is an introduction to the research which includes the background of study, problem description, aim, objectives, limitations and significance of the research. Chapter 2 discusses the previous research in this area and the academic framework for the study. Chapter 3 discusses the research methodology which includes methods for literature search, describe the research design, data collection and data analysis of the research. In Chapter 4, the summary of the results is presented. Chapter 5 discusses the results and findings. Chapter 6 finalises the thesis and includes the directions for further research.

1.9 Papers Supporting this Thesis

Four conference papers relating to this research are included in the thesis. These three papers deal with questionnaire survey research methods. The four conference papers are:

a. Lim X.Y., Olanrewaju A.L. and Tan S.Y. (2015), "Strategies For Affordable Housing Delivery", Australian Journal of Basic and Applied Sciences, 9 (25) Special 2015, pp. 118-124

b. Lim X.Y. (2015), "A Proposal for Affordable Housing Supply in Malaysia", 14th Management in Construction Research Association Conference and

Annual General Meeting (MiCRA 2015), Kulliyyah of Architecture and Environmental Design (KAED), International Islamic University Malaysia (IIUM), Gombak Campus, 12 November 2015.

c. Olanrewaju A.L., Lim X.Y., Tan S.Y., Lee J.E. and Adnan H. (2017), "Factors Affecting Housing Prices in Malaysia: Analysis of the Supply Side", International Conference on Housing, Planning, Environment and Social Sciences 2017 (HOPES 2017), Hotel Bangi-Putrajaya, Selangor, 21 December 2017.

d. Lim X.Y., Olanrewaju A.L., Tan S.Y. and Lee J.E. (2017), "Factors Determining the Demand for Affordable Housing", International Conference on Housing, Planning, Environment and Social Sciences 2017 (HOPES 2017), Hotel Bangi-Putrajaya, Selangor, 21 December 2017.

1.10   Research Outline

The outline flow of the research as follows:
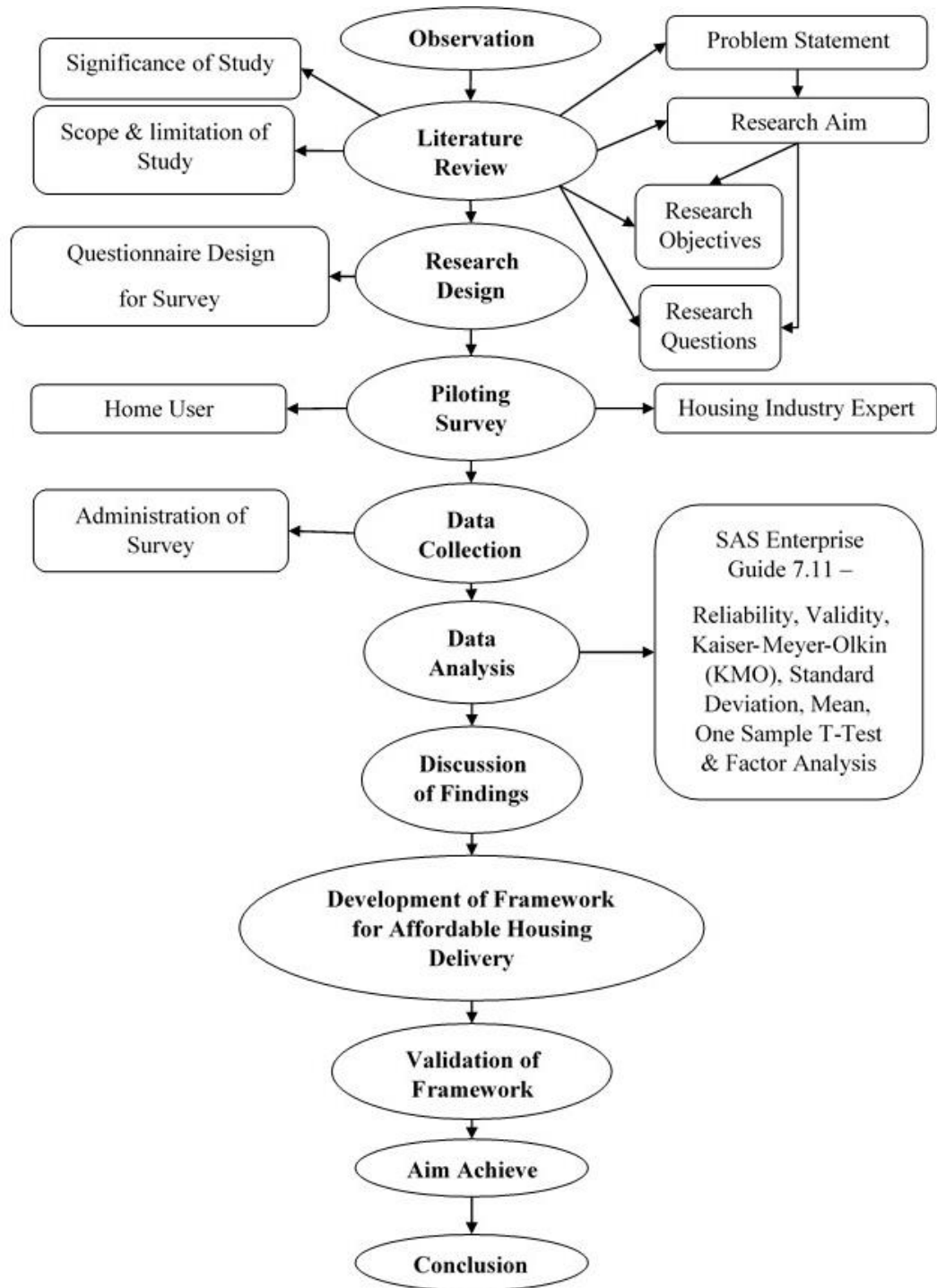
Figure 1.1: Research Flow Chart

1.11   Summary

This research aims to develop a framework to deliver affordable housing. The definition of framework is outlined as an overview, broad summary, or skeleton of interlinked items that supports the approach to a selected objective, and is a guide that may be changed as required by deleting or adding items (BusinessDictionary.com, 2018). To achieve the aim, objectives have been set to analyse the factors causing the Malaysian housing price to increase, to analyse the extent of availability of construction materials and to analyse the factors determining the demand for affordable housing. Housing within Malaysia is severely unaffordable (Demographia, 2017). The government has proposed schemes, programs, and incentives for developers, contractors, & homebuyers. However, the prices of the houses are still constantly increasing and the satisfaction levels of the house buyers have not increased comparatively. Therefore, the factors causing affordable housing prices to increase should be analysed. From the understanding of the developers, material shortage is a major problem causing increase in house price. Homebuyers seek adequate housing that they could afford to purchase (Khazanah Research Institute, 2015). Homebuyers also consider the factors such as good location of the housing with amenities, access to housing finance and a degree of mobility, a secure tenure and the choices, when they look for a house (Khazanah Research Institute, 2015). Analysing the factors can help to predict homebuyers' demand which will facilitate decision-making in the delivery of affordable housing.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter is concerned with providing an overview of the Malaysia population and types of residential building in Malaysia. Besides, this chapter include the study of the trend of housing price in Malaysia. This chapter also reviewed the affordable housing and the factors relate to the shortage of affordable housing in Malaysia.

2.2 Malaysia Population

Population in Malaysia has promptly increased. In 2010, the population was only 28.59 million, while in 2018, the population increase to 32.44 million (Department of Statistics, 2018). From 2010 to 2018, the population increased about 14 per cent. Malaysia aims to be a fully developed country by 2020. The estimated population in 2020 is 33.8 million (Department of Statistics, 2018). The total supply of residential units until 2017 is 5,428,493 units (NAPIC, 2017). A major

interpretation of the above statistics is, there are six people per house. This is considered high for a typical house in Malaysia with two to three bedrooms. Figure 2.1 shows that the population in Malaysia keeps increasing.
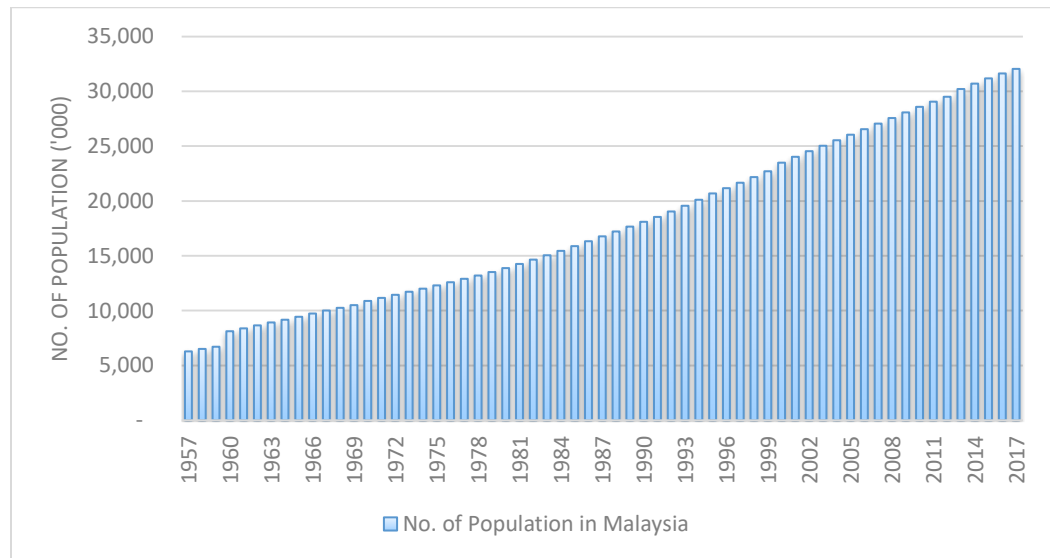
Figure 2.1: Population Estimation in Malaysia Year 1957 – 2017

(Source: EPU, 2018)

Population in Johor, Kuala Lumpur, Selangor, Putrajaya and Penang keep increasing (Figure 2.2). Selangor was the highest population. Kuala Lumpur is the capital city of Malaysia, but the population is almost equal to Penang because Kuala Lumpur has more shops and offices, and the residential buildings in Kuala Lumpur are expensive compared to Selangor. Therefore, the households living in Selangor travel to Kuala Lumpur for works every day.

Putrajaya mainly is the office and homes for the Malaysian minister officers and it became a state in 2010. Therefore, there are not many households who live in Putrajaya.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Johor	2,763	2,830	2,894	2,954	3,015	3,074	3,134	3,194	3,252	3,309	3,363	3,411	3,450	3,474	3,560	3,610	3,652	3,701
Kuala Lumpur	1,416	1,446	1,474	1,500	1,526	1,552	1,578	1,603	1,629	1,653	1,675	1,693	1,702	1,723	1,737	1,780	1,790	1,791
Selangor	4,189	4,318	4,446	4,577	4,713	4,850	4,986	5,127	5,269	5,418	5,502	5,600	5,702	5,905	6,051	6,178	6,292	6,381
Putrajaya	-	-	-	-	-	-	-	-	-	-	73	78	78	80	81	83	84	87
Penang	1,333	1,361	1,387	1,412	1,437	1,460	1,484	1,508	1,531	1,554	1,576	1,601	1,623	1,663	1,678	1,698	1,718	1,746

Figure 2.2 Population Estimation by State Year 2000 – 2017

(Source: EPU, 2018)

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2.2.1 Family Income

Malaysia's mean monthly household income in 2016 was RM6,958, but the median household income was only RM5,228 (Department of Statistic, 2017). Table 2.1 shows the household income in 2016. In medium income term, affordable house is housing that costs around three times of 12 months medium income, which is [3 x 12 x RM5,228 = RM188,208] RM188,208 per house.

Table 2.1 Percentage of Households Income in Year 2016

Households Income (RM)	Percentage (%)
< RM1,999	8.80%
RM2,000 - RM2,999	11.20%
RM3,000 - RM3,999	14.90%
RM4,000 - RM4,999	12.50%
RM5,000 - RM5,999	10.1%
RM6,000 - RM6,999	8.10%
RM7,000 - RM7,999	6.50%
RM8,000 - RM8,999	5.10%
RM9,000 - RM9,999	4.20%
RM10,000 - RM10,999	3.30%
RM11,000 - RM11,999	2.70%
RM12,000 - RM12,999	2.20%
RM13,000 - RM13,999	1.70%
RM14,000 - RM14,999	1.40%
> RM15,000	7.10%

(Source: Department of Statistic, 2017)

From Table 2.1, it is obvious there is about 57.50 per cent household cannot afford to own a house, because their salary is below median which is less than RM5,228. The rise of housing price is faster than the growth in household income. The majority of Malaysian low household earners, and the cultural preference are

towards home-ownership rather than rent, causing the high demand for homebuyers (Cheah et al, 2017).

2.2.2   Number of Family Members

The average number of family members in Malaysia in 2010 was seven members per household, while it decreased to six members per household in 2017. It was calculated by using the population divided by the stock of residential houses. Table 2.2 shows that the majority of urban areas in Malaysia such as Selangor, Johor, Kuala Lumpur and Penang have increased the number of the new residential building to solve the problem. However, for the states of Sabah, Sarawak, Kedah, Kelantan, Pahang, Terengganu, Perlis, Putrajaya and Labuan, the numbers decrease but are still considered as over-crowded.

Table 2.2 Number of Family Members in Malaysia by States in 2010 and 2017

States	Year 2010	Year 2017
Selangor	22	5
Johor	9	5
Sabah	159	19
Sarawak	18	12
Perak	11	6
Kedah	445	7
Kuala Lumpur	33	4
Penang	5	4
Kelantan	147	24
Pahang	5	7
Terengganu	5	13
Negeri Sembilan	2	5
Melaka	1	5

Table 2.2 Number of Family Members in Malaysia by States in 2010 and 2017 (Cont'd)

States	Year 2010	Year 2017
Perlis	2	11
Putrajaya	2	9
Labuan	1	9

(Source: EPU, 2018 and NAPIC, 2017)

2.3 Types of Residential Building in Malaysia

Housings are required to deliver security, safety, protection, experience, comfort, satisfaction, and convenience to the home users (Ju and Saari, 2011). There are different types of properties in Malaysia, like shop units, residential units, shopping mall, industrial units and purpose-built workplace (Ju and Saari, 2011). The residential units in Malaysia are classified into two types, which are landed properties and divided building. Landed properties contain the terraced house, semi-detached house and bungalow, whereas divided building contains apartment, flat and condominium.

    a. Terrace House (Row-House or Link-House)

Terrace house is also named as a 'row-house or link-house'. In Malaysia, terrace houses are the most common housing type and create sharing common bearing walls, linearly connected in rows and might be within the form of single or multiple storeys (Ju and Saari, 2011).

b. Semi-detached House (or Duplex House)

Two units of house sharing one wall and enclosed little spaces for garden in the boundary named as semi-detached house, usually in Malaysia, known as 'Semi-D' (Ju and Saari, 2011). The front view of the semi-detached house looks like a detached house or a bungalow (Ju and Saari, 2011).

c. Detached House

Detached house means one unit of a house designed in the boundary and enclosed by its own garden, Malaysians called it as 'Bungalow' (Ju and Saari, 2011). It should be single or multiple storeys. The current design of bungalows is provided with convenient facilities, security system (gated and guarded) and shared amenities (Ju and Saari, 2011).

d. Cluster House (Quadrant Double Story House or Cluster-Link House)

Cluster houses categorisation is a much higher density row or link homes wherever the two-row homes are butted along, eliminating the rear lane so as to achieve more unit numbers of over 123 units of a house per hectare (Ju and Saari, 2011). In keeping with Saari (1990), it is also named as 'quadrant double storey house' and 'cluster-link double storey house' (Ju and Saari, 2011). This categorisation may be classified as a cluster of four units of homes connected along irrespective of density (Ju and Saari, 2011).

e. Flat / Apartment House

Flat is usually outlined as a four-storey housing without an elevator or a high-rise housing attached with elevator (Ju and Saari, 2011). Flat is advanced as a high-density housing for low-income households. The design of flat and apartment are almost similar (Ju and Saari, 2011).

f. Condominium

The Condominium comes essentially with gated and guarded service and extremely popular among the higher household income in urban cities who wanted higher living condition, crime prevention, security and high quality finished (Ju and Saari, 2011). The perspective of housing categorisation, condominium is almost alike to apartment. However, the cost of a condominium is high and it comes with the shared in-house facilities such as swimming pool, gym room and kids playground.

Based on the summary of supply of residential units by type in Malaysia, there are 12 categories, which are single storey terrace, 2 to 3 storey terrace, single storey semi-detach, 2 to 3 storey semi-detach, detach, townhouse, cluster, low cost house, low cost flat, flat and condominium or apartment (NAPIC, 2017). Table 2.3 shows the units of each type of residential building in Malaysia in 2017.

Table 2.3 Residential Building in Malaysia Year 2017

Types of Residential Building	Units
Single Storey Terrace	1,017,505
2 to 3 Storey Terrace	1, 195,780
Single Storey Semi-Detach	197,526
2 to 3 Storey Semi-Detach	189,921
Detach	477,949
Town House	37,359
Cluster	33, 571
Low-cost House	683,868
Low-cost Flat	466,574
Flat	319,697
Condominium / Apartment	808,743
Total	**5,428,493**

(Sources: NAPIC, 2017)

The population growing rate is far greater and faster than the time needed for constructing buildings. There are six people per house, it is considered high for a typical house in Malaysia with two to three bedrooms. Malaysia faces housing affordability issue due to the slow household income growth and supply-demand mismatch (Cheah et al., 2017). Financial support continues to supply for purchases of homes for entitled borrowers, there are over 70 per cent of the housing loans being given to the first-time consumers and shut to simple fraction of recent housing loans guided in the acquisition of house or shelter below RM500,000 (Cheah et al., 2017). With the housing market in Malaysia, the structure, provided with the aspect associated with alternate factors, has resulted in an exceedingly letdown of the housing market to provide a suitable affordable housing supply for the plenty. On the demand aspect, the increase of housing value is rapider than the expansion in household income. The majority of Malaysians are low household earners, and a

cultural preference prone to home-ownership rather than rent, causing the high

demand for house buyers (Cheah et al., 2017).

2.4 Housing Price in Malaysia

From Table 2.4 and Table 2.5, it can be seen that housing prices in Malaysia

increase every year. Many big households cannot afford their own house due to

high housing price outstripped inflation. According to Bank Negara Malaysia

(2018), the actual median house price in Malaysia was RM313,000 in 2016, but the

median household income was only RM5,228 (Cheah et al., 2017). In 2016, the

central bank compared to global standards, the report showed that the houses in

Malaysia were "seriously unaffordable" (Cheah et al., 2017).

**Table 2.4 Malaysia Annual House Price Index and House Price Year 2001 -
2010**

Year	Index (2000 = 100)	Change Over 12 Months (%)	Annual House Price (RM)
2001	101.1	1.1	138,975
2002	103.6	2.5	141,449
2003	107.7	4.0	148,039
2004	112.9	4.8	155,796
2005	115.6	2.4	158,811
2006	117.8	1.9	162,626
2007	124.0	5.3	170,864
2008	129.8	4.7	178,238
2009	131.8	1.5	179,571
2010	140.7	6.7	189,604

(Source: NAPIC, 2015)

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Table 2.5 Malaysia Annual House Price Index and House Price Year 2010 - 2017

Year	Index (2010 = 100)	Change Over 12 Months (%)	Annual House Price (RM)
2010	100.0	5.5	217,857
2011	110.9	10.9	239,295
2012	125.8	13.4	271,384
2013	140.0	11.2	301,964
2014	153.2	9.4	330,428
2015	164.5	7.4	354,741
2016	176.1	7.1	379,843
2017	187.4	6.5	404,345

(Source: NAPIC, 2017)

According to Demographia International, the housing affordability index (median multiple methodologies) is used to measure the housing markets in urban areas. If a house can be supported using less than three times of a household median income, it is measured as affordable (Cheah et al, 2016). The median multiple of three times is based on the past economic trend in six nations where housing affordability is ranged between two to three times until 1980s or 1990s. While the accuracy of the median multiple indicates an affordable housing market might vary between countries, it is however a helpful broad measure for comparing housing affordability (Cheah et al, 2016). Table 2.6 shows the housing affordability rating.

Table 2.6 Housing Affordability Rating

Housing Affordability Rating	Median Multiple
Affordable	3.0 & Under
Moderately Unaffordable	3.1 to 4.0
Seriously Unaffordable	4.1 to 5.0
Severely Unaffordable	5.1 & Over

(Sources: Demographia, 2017)

In median multiple terms, Malaysian houses are considered more expensive than the houses in the United States, Singapore, Ireland, United Kingdom, Canada and Japan (Demographia, 2017). The median house price to median household income ratio has consistently exceeded the "affordable" level of three times since 2004 (Cheah et al., 2017). Houses in Malaysia have reached the levels considered "seriously unaffordable" in 2014 (house price-to-income ratio of 4.4) compared with "moderately unaffordable" levels (four times house price-to-income ratio) in 2012. The house price-to-income ratio reached "severely unaffordable" level of 5.4 times in Kuala Lumpur and 5.2 times in Penang in 2014 (Cheah et al., 2017). Table 2.7 shows the Housing Affordability Ratings by Nation in 2017.

Table 2.7 Housing Affordability Ratings by Nation in 2017

Nation	Median Market
Hong Kong	19.4
New Zealand	8.8
Australia	6.6
Ireland	4.8
Singapore	4.8
United Kingdom	4.6
Canada	4.3
Japan	4.2
United States	3.8

(Sources: Demographia, 2017)

2.5 Affordable Housing

The concept of affordable housing is to solve the low- and medium-income people with housing problems around the world (Olanrewaju and Tan, 2017). The aim of affordable housing is to provide low and middle-income people with a home. Affordable housing has a variety of meanings according to different people. However, the basic principle of affordable housing is the same as it is considered if the homebuyer will not spend more than 30 per cent of their household income for the housing loan or rental (Olanrewaju et al., 2016). There are several positive impacts on affordable housing which are economic impacts and social impacts. The advantages and costs production, business and funds result from housing projects are considered as economic impacts, while for social impacts, there is a reaction on lifestyle (Lubell et al, 2007).

2.5.1   Affordable Housing in Malaysia

Malaysia has targeted to increase the affordable housing development. Like other countries, Malaysia also faces the issue of restricted lands (Bakhtyar et al., 2012). The Malaysian planners may face the restriction on the use of land and delightful suburbs issue. According Hashim (2010), the dense living conditions are inflicting the land value to rise because of the insufficiency of available lands. Therefore, housing developers are further burdened by high-cost lands, and families

in low-income and median income are not able to pay housing loans to purchase

their own property (Bakhtyar et al., 2012). Besides, a mismatch between the supply

and demand in Malaysia is the trend for affordable housing. The number of housing

demand is more than the number of housing supply.

2.5.2   Housing Affordability Measurement

Thirteen housing affordability measurement for both homeowners and renters are

listed in Table 2.8.

Table 2.8 Summary of Housing Affordability Measurement

Housing Affordability Measurement	Description
National Association of Realtors Housing Affordability Index	The capability of a median-income household to purchase median-priced of the house.
Variant Housing Affordability Index	Lower down the percentage of down payment and fixed the loan interest.
Housing Opportunity Index	The share of homes sold would have afforded to the family household income with middle salary, in view of standard loan endorsing criteria.
Housing and Urban Development Guideline	Household if no use more than 30 per cent of household monthly income spent on housing loan and rental.
Housing Wage	The hourly income required to afford the Fair Market Rent in specific area.
HR 3899 Definition of Housing Affordability	Comparable to NAHB with the exception of uses 150 per cent of median income instead of only median income

Table 2.8 Summary of Housing Affordability Measurement (Cont'd)

Housing Affordability Measurement	Description
Affordability Measure by MSA	Due to increase in acquiescence costs associated with emission regulation, it used to measure change in affordability
Price Index of New One-Family Sold	Measures changes over time in the transaction housing price of new single-family households with the same features
Federal Home Loan Bank of Atlanta Lower-Income Housing Affordability Index	The capability of lower-income households to meet the requirements for the loan on a modestly-priced home
Shelter Poverty	Household size and income reflect the maximum amount available for housing
Quality Adjusted Measure	Figure out the number of households in which 30 per cent household would not able to pay for house price
Supply of Affordable Housing Units	The share of opportunity rates for housing units considered affordable, according to the Fair Market Rent
Housing Affordability Mismatch	The percentage of housing units, possibly affordable to households of a certain household income to the number of households in that household income range

(Source: Melanie et al., 2010)

The median multiple measurement and housing cost burden measurement were used in this research. The median multiple measurement is to evaluate housing markets in urban areas, if a household uses less than three times of a household median annual income to pay for housing loan and rental, it is considered affordable (Demographia, 2015).

On the other hand, housing cost burden is used in the Organisation for Economic Co-operation and Development (OECD) countries, Australia and United States. A household is considered housing cost-overburdened, and risk on

insufficient household income for transportation, health care and food if the household pays more than 30 per cent (HUD, 2003).

2.5.3   Affordable House Schemes in Malaysia

Generally, affordable housing in Malaysia is targeted for the middle-income households (Cagamas Holdings, 2013). Baqutaya et al. (2016) found affordable housing issues were faced by the middle-income households (Baqutaya et al., 2016). Middle-income households are eligible for affordable housing or affordable house built by private developers (Khazanah Research Institute, 2015). This group is not covered by the housing assistance programme since they are not eligible for the scheme of low-cost house and social housing and yet, cannot afford the private sector's medium cost housing or even any of the medium cost residential projects. The Statistic shows that 40 per cent of the Malaysian middle-income population is unaffordable to buy their own house (Chiali and Choon, 2014).

Table 2.9 Summary of Affordable Housing Scheme in Malaysia

Affordable Housing Schemes	Description
PR1MA	This scheme is to provide middle-income households affordable homes urban cities. This scheme is to set up, develop, construct and maintain high-quality housing for this programme. This scheme works with private developer to deliver affordable homes.
PPA1M	This scheme for government-led initiative to help low and medium household income Malaysia civil servants, to affordably own a snug house.
RMR1M	This scheme was established to support low-income household who does not own a single home or live in dilapidated homes.
People's Housing Program	This scheme is the Government initiative to low-income household on relocating squatters and meet the wants for housing.
MyHOME	This scheme is to support low-income households to own a house at an affordable price. This scheme collaborate with qualified private sector developers. The government will subsidies of RM30,000 per affordable home sold to the developers.
RUMAWIP	This scheme target of providing affordable housing to the citizens of the Federal Territories. The completed affordable housing units are through public-private partnerships with non-public sector construction companies.
Rumah Selangorku	This scheme is to confirm Selangor citizens are able to own a comfortable, good, and secure home to live in Selangor. This scheme will construct by non-public sector companies.
Youth Housing Scheme	This scheme is to provide homes for aged between 25 to 40 years married youth with a household income not more than RM10,000 per month and it is first-time home ownership scheme.
My First Home Scheme	This scheme is to help young working adults to own their first home. This scheme allows young adults to own their first home without a 10 per cent down payment and obtaining 100 per cent on housing loan.
MyDeposit	This housing scheme is to contribute 10 per cent of the house price, or with the maximum of RM30,000, to first-time buyers looking for homes priced below RM500,000.

Table 2.9 Summary of Affordable Housing Scheme in Malaysia (Cont'd)

Affordable Housing Schemes	Description
Transit House Program	This scheme help who just married a living place in the urban area especially Kuala Lumpur. This program launched in early 2014 for the household with low income to own their first house.
Housing Loan Schemes	This scheme is controlled through a trust known as the Housing Loan Trust fund for low-income household.
Penang Affordable Housing Scheme	Penang State Government initiative in an effort through this scheme to deliver quality housing for resident Penang with affordable prices.
DPR Johor	This scheme to make sure property developers in Johor offer and build affordable housing options within property development projects.
RMM Pulau Pinang	This scheme is Penang State Government initiative in an effort through this scheme to deliver quality housing for resident Penang with affordable prices This scheme is aimed to provide affordable housing in strategic locations around Penang. The construction project through public-private partnerships.
RMM SPNB	This scheme aims to deliver affordable own comfortable homes to low income household. SPNB has successfully completed several projects through the RMM programme such as low costs, low medium cost and medium cost housing.
RMM Sarawak	This scheme purpose to build low and medium cost house and sell to Sarawak low income households.

(Sources: Khazanah Research Institute, 2015; KPKT, 2015; SRP, 2013; BSN, 2015; Zainon et al, 2017 and PMM, 2014)

2.5.3.1 PR1MA

This scheme was established under the PR1MA Act 2012. This scheme is to set up, develop, construct and maintain high-quality housing for this programme. This scheme is to provide middle-income households affordable homes in urban cities (PR1MA, 2017).

There are various sizes and types of PR1MA homes within an integrated community; reasonably designed to ensemble different household necessities. The price of the house is between RM100,000 to RM400,000. PR1MA homes will deliver in the strategic location around Malaysia. Malaysians with RM2,500 to RM15,000 monthly household income are eligible to apply (PR1MA, 2017).

2.5.3.2 PPA1M

1Malaysia Housing Projects for Civil Servants (PPA1M) is an affordable housing scheme launched in 2013 for civil servants (1Malaysia, 2018). This initiative was introduced to allow low and middle-income civil servants the opportunity to own homes, especially in major cities. This scheme emphasises on delivering homes of the right shape, size, quality, location and price for civil servants (1Malaysia, 2018). Affordable housing is priced about 20 per cent to 30 per cent lower than the market

value for civil servants with a monthly income of less than RM10,000 (The Sun Daily, 2016).

2.5.3.3 RMR1M

This scheme was aimed to provide homes for low-income households, such as poor families, farmers and fishermen who live in dilapidated houses or do not own a home (Nadhirah, 2014). The citizens of Malaysia with a household income less than RM3,000 per month, not having their own home or have decrepit houses are not impeccable, have land or site is suitable and there are no limitations or charges on him (The Sun Daily, 2016). If the land does not have a place by the candidate, Certificate or Statutory approval from the landowner is required to fabricate and contract the land to Syarikat Perumahan Negara Berhad (Nadhirah, 2014). This scheme delivery houses evaluated at RM65,000 at Peninsular Malaysia and RM79,000 at Sabah and Sarawak on their property with the legislature sponsoring RM20,000 (The Sun Daily, 2016).

2.5.3.4 PPR

This scheme is an administration program for the resettlement of squatters and habitation prerequisites for low income household. The National Housing

Department or Ministry of Housing and Local Government is the fundamental actualising organisation for this scheme extends all around Malaysia. PPR comprises of two classifications, PPR for Rental (PPRS) and PPR for Ownership (PPRM) (KPKT, 2018).

PPRM program initially actualised just in the province of Pahang. However, from the Tenth Malaysia Plan, PPRM program has been extended to the territory of Kelantan, Kuala Lumpur and Sabah. PPRM houses are sold at costs running from RM30,000 and RM35,000 for every unit in Peninsular Malaysia and RM40,500 in Sabah and Sarawak (KPKT, 2018).

Every one of the houses built under both PPRM and PPRS will utilise the particulars of arrangement and outline of minimal effort lodging set out in the National Housing Standard for Low-Cost Housing Flats (CIS2) (KPKT, 2018). A program of PPRS was acquainted in February 2002 proposed to be leased to the objective gathering (low-wage gathering and squatter) at RM124 every month. The legislature likewise executed PPRM aimed at enabling low income households to have the chance to possess their own particular homes. Presently, this program is executed in the province of Pahang. PPRM houses are evaluated at RM30,000 and RM35,000 for every unit (KPKT, 2018).

2.5.3.5 My Home

MyHome Scheme was declared by the sixth Prime Minister of Malaysia while tabling the Supply Bill 2014 in the Parliament on 25 October 2013 (Nadhirah, 2014). This plan is one of the administration's measures to urge the private parties to assemble more moderate homes. This plan offers motivating forces of up to RM30,000 for every unit to profit home purchasers and private designers (KPKT, 2018). In 2014, the government distributed RM300 million for the development of 10,000 units of reasonable lodging over the nation (KPKT, 2018).

2.5.3.6 RUMAWIP

The Rumah Wilayah Persekutuan approach has been made to layout the bearing and give a premise to nearby experts and engineers to plan and develop affordable housings (KWP, 2018). The Federal Territories Ministry had propelled the Federal Territories Affordable Home Program (RUMAWIP) on 8 April 2013 to deliver 80,000 units of affordable homes in the Federal Territories within five years. These include 55,000 units in Kuala Lumpur, 20,000 units in Putrajaya and 5,000 units in Labuan (KWP, 2018).

RUMAWIP aims to assist the middle-income earners who reside or work in the Federal Territories with household income below RM15,000 and single individuals with income below RM10,000. The price of the houses under RUMAWIP has been set at not more than RM300,000 per unit (KWP, 2018).

2.5.3.7 Rumah Selangorku

Rumah Selangorku is a people-centric initiative by the Lembaga Perumahan dan Hartanah Selangor (LPHS) offering affordable homes (Sime Darby Property, 2018). The Rumah Selangorku scheme is unlike any other affordable housing programmes previously launched. These homes are built by developers. For every project that the developers build in the state, a certain allocated number of Rumah Selangorku units will have to be built. The allocation is 120 Rumah Selangorku homes per acre of the developer's project. This will also depend on the district and sub-district of the developments' locations (Propsocial, 2018).

The Rumah Selangorku homes aim to provide more than just a roof over the heads of residents. It aims to provide liveable lifestyle developments with ample facilities (Propsocial, 2018). Apart from that, there will also be guidelines set for the pricing and sizes of the units, therefore ensuring more value for their price (Propsocial, 2018). Rumah Selangorku houses are priced between RM42,000 and to RM250,000 per unit (Property Insight, 2018).

2.5.3.8 Youth Housing Scheme

The administration's Youth Housing Scheme (YHS), which is exclusively offered by Bank Simpanan Nasional (BSN), has been reaching out to Malaysian residents of 21 to 45 years of age and single or married youths with a household income less than RM10,000 per month (The Sun Daily, 2017). YHS is an association between the administration, BSN, Cagamas Bhd. and the EPF. It was propelled in July 2015 and offered 100 per cent for first-time home purchasers (The Sun Daily, 2017).

Youth Housing Scheme was expired in the end of 2017. It was focused at married young between 25 and 40 years old with a joined household income less than RM10,000, who are purchasing their first home. Bank allows for home credits, both conventional and Islamic, extending from RM100,000 to RM500,000 with a residency of up to 35 years or the age of 65, whichever is prior (The Sun Daily, 2017).

Effective candidates also get extra financing of up to five per cent of the price tag for the cost of Mortgage Reducing Term Assurance or Mortgage Reducing Term Takaful. Moreover, the government gave RM200 every month to help regularly scheduled payments, which were credited to the borrowers' financing, represented in two years. The plan was offered for financing the buy of completed, under development or sub-sale properties with 100 per cent stamp duty exclusion

on the exchange of ownership and facility documents for properties estimated up to RM300,000 (The Sun Daily, 2017).

2.5.3.9 My First Home Scheme

My First Home Scheme is one of the measures declared by the Government in the 2011 Budget to help the youth to possess a home. The plan enables homebuyers to get a 100 per cent loan from financing institutions, empowering them to possess a home without having to pay a 10 per cent down payment (SRP, 2013).

Cagamas SRP Berhad will ensure the banks to finance over the 90 per cent, which is if a borrower acquires 100 per cent loan, Cagamas SRP will ensure 10 percent (from 90 per cent to 100 per cent) of the loan. Cagamas SRP Berhad ensures to just reimburse the bank for any misfortune acquired because of financing over the 90 per cent (SRP, 2013).

This scheme is available to every single Malaysian resident aged below 35 years or household income of not more than RM5,000 per month for single borrower and household income of not more than RM10,000 per month for joint borrowers. The scheme covers both completed and ongoing development. The certification is compelled upon full payment of the financing (SRP, 2013).

2.5.3.10   MyDeposit

The First Home Deposit Funding Scheme (MyDeposit) has been propelled. Reported amid Budget 2016, the scheme is aimed at helping the low-middle income household earns RM10,000 and below (SPRN, 2018). The government has apportioned about RM200 million for the MyDeposit Scheme for first-time house purchaser. It involves an administration conceding of either 10 per cent of the property, or at the most extreme of RM30,000, whichever is lower. Property bought under MyDeposit cannot be sold within 10 years upon successful from Sale and Purchase Agreement date (SPRN, 2018).

MyDeposit plans to help the household with the household income between RM3,000 to RM10,000 and first-time house purchaser within one family. The price tag run is between RM80,000 to RM500,000 (SPRN, 2018).

2.5.3.11   Transit House Program

The Transit House Program (RT1M) is the Ministry of Urban Wellbeing, Housing and Local Government (KPKT)'s aim to help those just married to have a living place in the urban area especially Kuala Lumpur. This program was launched early 2014 for the household with low income to own their first house (Khazanah Research Institute, 2015).

The 1Malaysia Transit Homes programme aims to provide housing facilities for young married couples under 30 years old. The rental rate will be RM250 per month and a 3-year rental period. The Transit House Program aims to assist earners with household income not more than RM5,000 with no criminal record. Applicants must not own any house in the areas or states where the application for transit homes are made and work in the areas or states where the application for transit homes are made (KPKT, 2018).

2.5.3.12   Housing Loan Schemes

This scheme was affirmed by the Malaysian Parliament on 17 December 1975 by revising the Second Schedule of the Financial Act 1957 (Amendment 1982). This

plan is managed through a fund known as the Housing Loan Trust fund for low-income household (Khazanah Research Institute, 2015).

This scheme is set to enable the lower-income household to finance the cost of house development with the end goal for them to approach an essential shelter (SPP, 2015). Financing for SPP not more than RM60,000 which excluding protection scope and the advance loan duration, not over 35 years or maximum at 70 years age of the candidates. There is an additional of 2 per cent service charge (SPP, 2015).

Candidates including their spouse must not work as a government servant and do not possess a house. Household income must be between RM1,000 and RM3,000. They must have their own particular land or the land is possessed by close relatives (SPP, 2015).

2.5.3.13   Penang Affordable Housing Scheme

This scheme is a Penang State Government initiative with an end goal to give a quality housing at an affordable price for the citizens in Penang (PMM, 2018). Through the PMM scheme, the state government means to give a scope of affordable homes in different key areas crosswise over Penang. The greatest

affordable housing project in Penang deliberately situated in Bandar Cassia, Batu Kawan.

This scheme aims to deliver housing facilities to the citizens in Penang. Household income of not exceeding RM2,500 every month is eligible for low-cost houses; household income not exceeding RM3,500 per month for low-medium cost houses; amongst RM6,000 and RM10,000 per month for affordable housing. For low cost and low-medium cost applications, the candidate and spouse must not claim any property in any state in Malaysia, while for affordable housing applications, the candidate and spouse must not possess any property in any state in Malaysia with the exception of low-cost homes (PMM, 2018).

2.6 Malaysia National Housing Policy

The National Housing Policy (NHP) was propelled on 10 February 2011 stipulated that the policy is to make the improvement of the housing development division of the government, state and local levels. The National Housing Policy goal is to give fair, agreeable, satisfactory, quality and affordable houses to enhance the way of life of the general population. These destinations are defined in six thrusts and twenty policy statements (National Housing Department, 2011).

One of the policy features that the government intends to improve the part of state government offices, other than federal governmental organisations and the private segment, in proceeding with the effort to give affordable houses to lease or available to be purchased. The government has assumed the main part in delivering affordable housing, the National Housing Policy empowers state governments and state organisations to likewise assume a more dynamic part in this area (National Housing Department, 2011).

Under the National Housing Policy, the Ministry of Housing and Local Government (Malaysia) (MHLG) plans to set the costs for affordable houses, especially in projects which are financed by the government. Incorporating into the arrangement is a component to control the proprietorship and offer of these houses to stay away from speculation. Private developers are additionally urged to create medium cost houses to satisfy the necessities of the middle-income household with the household incomes of RM2,501 to RM7,500 per month (Nadhirah, 2014).

The low-income household below RM2,500 per month will keep on receiving the government's consideration of housing issues. Delivering housing to all, particularly low-cost houses for the low-income household and empowering the arrangement of medium cost houses for the middle-income household, is likewise one of the National Housing Policy approaches (Nadhirah, 2014).

Under the National Housing Policy, the State governments have been given the adaptability to decide the share of 30 per cent of low-cost houses to develop in blended advancement territories, by considering the situational interest for ease houses and in addition tending to the issue of unsold units (Nadhirah, 2014). Before the National Housing Policy, most state governments settled the standard for low-cost houses at 30 per cent for housing projects over a specific size. In rural area particularly, this has prompted supply surpassing interest, which thus has brought about empty units. This adaptability permits the state governments to change this statement to meet the actual needs in particular areas. The adaptability is regardless being controlled by some private developers not to manufacture low-cost houses in blended improvement by proposing the housing project in an alternate stage (Nadhirah, 2014).

The Ministry additionally wants to set a reasonable rental rate for low-cost houses. The present rental rate for open ease houses all through the nation is RM124 every month. There is a need to evaluate this rate, which has stayed unaltered for as far back as a decade (Nadhirah, 2014).

Access to home financing by the lower middle-income household is another real limitation on homeownership. Housing is the biggest part of the use of each

family unit and, in Malaysia, qualification for housing mortgage from financial institutions is assessed against the borrower's obligation-to-income ratio. The general decides that the monthly repayment on housing loan most not exceed 30 per cent of the monthly household income. In surveying a borrower's reimbursement ability, the bank establishment likewise considers other financial obligations (Nadhirah, 2014).

The edge of financing will rely upon the estimation of the property, the standard is 90 per cent. On 5 July 2013, as a feature of an arrangement of measures for a family obligation that has been spiralling at a normal yearly rate of 12 per cent in recent years, Bank Negara Malaysia (BNM) forced a most extreme residency of 35 years for the financing of private and non-private property buys (Nadhirah, 2014). This progression captures the long-term enthusiasm of customers who were amassing obligations past judicious obligation-benefit proportions, instigated by the accessibility of home financing, that offer residencies of up to 45 years and individual financing of up to 25 years. Nonetheless, families that have the financial capacity to go up against borrowings would keep on having the access to financing (Nadhirah, 2014).

Housing, education and healthcare are the most essential human needs that must be satisfied to guarantee a harmonious society. The government will keep on

providing financial help to the low-income household so that they can own a house (Nadhirah, 2014). The low-income household faces different obstructions, including the failure to raise 10 per cent of the house price for the upfront payment and issues in securing bank advances to buy these houses. Subsequently, some type of monetary help is expected to guarantee that the low-income household can possess houses (Nadhirah, 2014).

2.7 Factors Related to Shortage of Affordable Housing

Malaysia faces a deficiency of affordable houses for the lots (Cheah et al., 2017). Currently, interventions within the housing market are targeted chiefly on the demand facet, like policies permitting one hundred per cent finance or subsidising the price of homes (The Star, 2017).

These styles of policies might not be proper within the long-standing time as homebuyer become more indebted, whereas house prices stay high (The Star, 2017). As affordable housing could be a structural issue, and not a welfare, we want to tackle the problems on the availability facet that is to produce more affordable housing.

Under the Eleventh Malaysia Plan, the Malaysia government has already made public the necessity for affordable housing to alleviate the increasing price of

living. The government targets to produce 606,000 new affordable homes throughout the course of the Eleventh Malaysia Plan, traversing from 2016 to 2020, incorporates related degree of data while coordinating free market activity progression and build up a land bank for future affordable homes (The Star, 2017).

Essentially the matter with affordable housing boils all the way down to one in every supply. Upon the origin of the PR1MA theme, the initial target was to make five hundred thousand homes by 2018, that was then revised down by over half, to 210,000. Six years once its first launch, solely four per cent of the revised target has been met (The Star, 2017).

The problem herein lies with the land acquisition. PR1MA estimated that it would regard 12,500 acres for its initial arrangement of 500,000 units. However, it obtained 108 acres, of that solely thirty-nine acres were appropriate for development, simply enough to finish one per cent of its target. Land scarceness is a problem, particularly within the Klang depression, as prime locations would sometimes be earmarked by personal development (The Star, 2017).

Getting around this issue is on the far side scope of PR1MA, as the land problem area under the jurisdiction of state governments, that makes negotiations with government agencies and varied stakeholders quite difficult (The Star, 2017). In addition, the land price is a difficulty. Despite being a reasonable housing

developer, it is imperative that it additionally gains a profit, albeit at smaller margins compared to non-public developers (The Star, 2017).

With land closed to key economic areas being expensive, most of the PR1MA homes are being designed isolated from the town. Location is additionally key once it involves cheap housing. As an example, a private operator in the capital of Malaysia could notice the housing price is much lower at Sepang or Batang Berjuntai. However, the transportation price will simply wipe off the savings from owning such a unit (The Star, 2017).

While urban communities around the world research in soothing the affordable housing issue, advance stays moderate in Malaysia (Cheah et al, 2017). Housing stays distant for a few Malaysian households notwithstanding the arrangement of the bank loan, proceeded with the concern about house estimation development outpacing monetary benefit development (Cheah et al, 2017). This stresses the need to restore and enhance the record of household, aboard actualising measures to extend home monetary benefits within the longer-run, since the encounters of thriving urban communities have appeared, consolidated endeavours by the government, banks, developers, interest teams, buyers and regulators alike area unit required to bridge the affordability gap (Cheah et al, 2017).

2.8 Price Instability of Construction Materials in Malaysia

A research in 2012 indicated that construction materials comprise around 74 per cent on average from the overall construction value or cost for building works just with the presumption of overhead and profit margin at 15 per cent from the cost of goods sold and construction workers (CIDB, 2017).

Instability of construction materials price is caused by shortage or oversupply of construction materials (CIDB, 2017). Any unpredictability to the prices especially for major construction materials will influence the entire expense of construction. In this way, the projection of demand for construction materials will fill as a guide for the producer to plan their supply and will help the government in preparing the national policy including tending to the effect of construction materials price to construction cost (CIDB, 2017). Besides, the main components and subcomponents of construction materials are interrelated. The shortage of the main components will cause the subcomponents such as bricks, tiles, windows, doors and ironmongeries to face the same issue.

According to Master Builders Association Malaysia in The Edge (2014), construction materials supply shortages would cause the price instability, so it will affect the whole value chain if not tended to comprehensively. Construction

companies in Malaysia are aware of the shortage in construction materials such as ready-mixed concrete, sand and aggregates, which could increase the construction cost and burden the builders (The Edge, 2014). Supply shortage of construction materials will lead to the material prices instability and ultimately increase the project cost. This issue will not only affect contracts, but it affects the whole value chain, and the end users which are the homebuyers will be affected too (The Edge, 2014).

In 2016, Malaysia faced a sudden shortage in steel, causing a rapid increase in its price (The Star, 2016). According to industry experts, the shortage was caused by radically lower imports of products from China, because of the expanding request of steel in China. The shortage was also caused by the Chinese exporters cancelling their prior contracts as they could get more profit in China. Less imports of steel caused the prices to increase rapidly (The Star, 2016).

The increase of construction material price, particularly increment up to 50 per cent under a half year can be adverted to building contractors. They ordinarily work based on a signed contract is predicted to have a sudden change in price. In the event that the circumstance is not monitored and regulated, not just the contractors will run out business, the homebuyer will lose the chance to have their house built promptly at affordable cost (Mansur et al, 2016).

2.9 Gap of Knowledge of The Research

Previous research had not covered the relationship of supply and demand for housing. Previous studies merely researched on housing. The relationship of supply and demand of affordable housing was conducted in this research. This research found that the construction materials are an important factor that may cause the housing price to increase.

2.10   Summary

Malaysia aims to be a fully developed country by 2020. The estimated population in 2020 is 33.8 million (Department of Statistics, 2018). The total supply of residential units until 2017 is 5,428,493 units (NAPIC, 2017). As a major interpretation of the above statistics, there are six people per house. Due to the disappointment in the market for delivering affordable housing for the majority, housing in Malaysia stayed unaffordable to numerous households in 2016 (Cheah et al, 2017). Therefore, the government provides affordable housing schemes aiming to provide housing facilities to residents in Malaysia.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The aim of this chapter is to describe the overview of the methodology carried out in this research. The chapter starts with discussions on the research problems, the research questionnaire and the research aim and objectives. The methods of sampling as well as the scope and limitations of the research are also described in this chapter. Figure 3.1 shows the structure of the research design. This chapter also rationalises the questions addressed to the respondents.
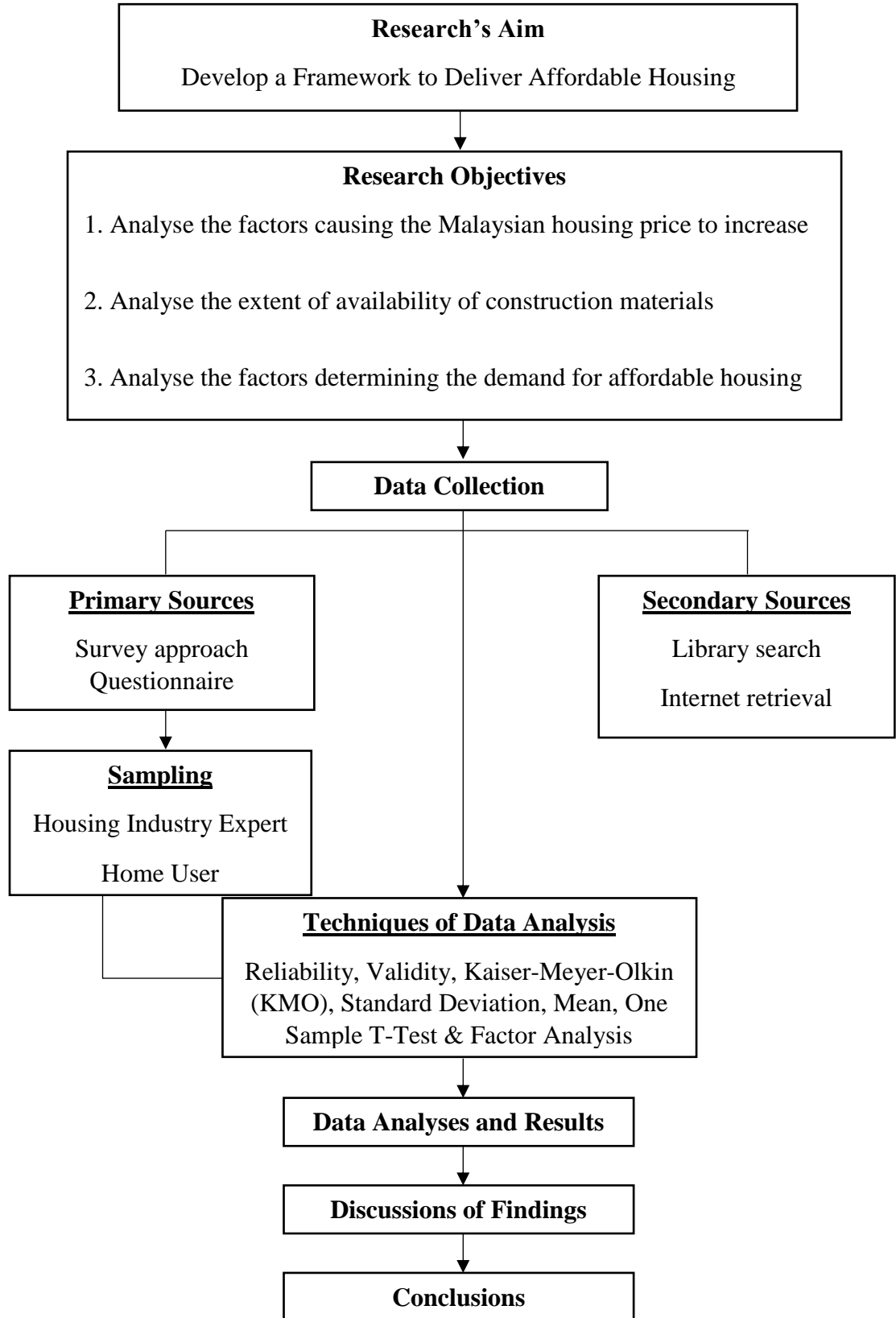
Figure 3.1 Structure of the Research Design

3.2 Recapitulation of Problem Statement

In Chapter 1, it has been established that houses in Malaysia are severely unaffordable (Demographia, 2017). The government has proposed schemes, programs, and incentives for developers, contractors, and homebuyers. The prices of the houses continue to increase and the satisfaction levels of the homebuyers has not increased comparatively. In a study conducted by Olanrewaju et al. (2016), they reported that most households in Malaysia spent over 30 per cent of household income to own or rent and operate their homes. In terms of index, the house costs have inflated by 1.86 from 2009 to 2016 whereas that of the high rise is a lot severe with an increase of 2.12 in a similar period (NAPIC, 2017). Therefore, there is the need to provide an answer to why housing prices are increasing in Malaysia. Multiple reasons could be the factors for the increase in the housing prices. Part of the problem could be accountable to developers, contractors, government policies, and third-party agencies. In this study, the causes of the increase are examined from the supply side perspectives. Understanding from the developer, material shortage causes a major problem for the increase in house price. The extent of availability of construction materials should be analysed. Homebuyers seek affordable housing to purchase (Khazanah Research Institute, 2015). Homebuyers also consider factors such as good location of the housing with amenities, access to housing finance, a secure tenure and a degree of mobility and choice, when they look for a house (Khazanah Research Institute, 2015). Analysing the factors determining the demand for affordable housing will facilitate the decision-making in the delivery.

Previous researchers have investigated the homebuyers' requirements, nevertheless, they have not focused on affordable housing and have not analysed the interaction between the requirements. Therefore, there is a need to know the factors that determine the demand for affordable housing.

3.2.1   Research Aim

The aim of this research is to develop a framework to deliver affordable housing.

3.2.2   Research Objectives

The objectives of this research are as follows:

1.   To analyse the factors causing the Malaysian housing price to increase

2.   To analyse the extent of availability of construction materials

3.   To analyse the factors determining the demand for affordable housing

3.3 Research Concept

Concepts are names, labels and meaning we attached to the word we used (Olanrewaju, 2008). Concepts enable us to come to terms with our experience on how we view the "world". The concepts of this research are affordable housing. Besides, this research analyses the factors causing the housing price to increase and determines the demand for affordable housing and develops a framework to deliver affordable housing.

3.4 The Sampling of the respondents

The expression "sample" implies an example or part of an entire (populace) which is attracted to indicate what the rest is like (Naoum, 2013). The sample survey obtains data from a subset of a population, in order to estimate the population attributes (Stat Trek, 2017). Sampling is necessary for a survey research method involving a large population due to time, cost and accessibility factors. This is on the grounds that it is not generally down to earth or conceivable to incorporate the whole populace in a research. There are two methods of sampling, namely the random sampling and the non-random sampling (Fellow and Liu, 2008). The term 'random' means selecting subjects (the respondents) arbitrarily and without purpose (Naoum, 2013). In the random sampling method, the chance of selecting a respondent is equal, whereas, in the non-random sampling method, the chances or

the possibility of a selecting a respondent is not equal (Research Methodology, 2018).

The non-random sampling method was used in this research. The random sampling method cannot be used because it requires the complete list of the respondents (Research Methodology, 2018). Due to the available time frame and accessibility factors, the complete list of the respondents to this research could not be obtained. Face-to-face questionnaire distribution and email questionnaire attachment were sent to various housing industry experts and home users in Malaysia, but they were unable to provide the database to the researcher. The housing industry experts being contacted included the architects, the engineers, the quantity surveyors, the land surveyors and the contractors in Malaysia. Six residential buildings were contacted in Penang:

1) Taman Seri Hijau, Jelutong residents;

2) Relau Vista Apartment residents;

3) Sri Kristal Apartment Farlim residents;

4) Taman Kristal Apartment Tanjung Tokong residents;

5) Menara Kuda Lari residents; and

6) Sri Pelangi Datuk Keramat residents

Penang is divided into two parts which are the island and the mainland. Land area in Penang Island is limited but the demand for housing is high despite the high price. Therefore, the research area is focused on Penang. The six residential buildings were chosen base on the location around Penang Island. There are similarities among the six residential buildings such as the type of house and size of the building.

There are five types of the non-random methods; convenience sampling, purposive sampling, quota sampling, self-selection and 'snowball' sampling (Lund Research, 2018). However, the convenience sampling method is used for this research for its simplicity and consistency with the design of this research.

3.4.1 The Convenience Sampling Method

In this research, convenience sampling method was used as there are tight deadlines and time constraint. Convenience sampling is helpful in accessibility and nearness to the researcher (Joan, 2009). It reduces labour requirements, cuts the sampling cost and assembles fundamental data rapidly (William et al., 2010).

3.5 The Research Design

The research design is the sensible arrangement of research to allow valid and reliable conclusion. This section concentrated on the approach for information accumulation in this research.

Quantitative research was used in this research. Quantitative research includes the utilisation of mathematical, computational, and statistical tools to determine the results (SIS International Research, 2018). It is decisive in its purpose as it endeavours to quantify the problem and understand how pervasive it is by searching for projectable outcomes to a larger population.

Furthermore, qualitative research is commonly progressively explorative, a type of research that is reliant on the collection of verbal, behavioural or observational information that can be deciphered in a subjective manner. It has a wide scope and is normally used to investigate the reasons of potential issues that may exist (SIS International Research, 2018).

3.6 The Method adopted for this research

The decision of the method to be embraced for a specific research is dictated by the picked point and the sort of information to be collected (Olanrewaju, 2008). They likewise contended that the central purpose of the strategy to be utilised is "wellness for the reason". This research combines the literature and survey approaches in order to achieve the research objectives.

3.7 The Deskwork

The literature reviews for the purposes of this research focuses on the available and relevant publications. This publication includes conference papers, journal reports, seminar papers, convention proceedings, national dailies, magazines, thesis and texts (Olanrewaju, 2008). Reviews of the related literature and theory are undertaken in order:

1. To provide background information on housing in Malaysia.
2. To consider and remark on what other researchers have found on the issues of the housing supply and demand in Malaysia.
3. To likewise investigate electoral arrangements(s), assuming any.
4. To develop the research objective and aim for this research.

5. To confirm if the findings are consistent or not with the findings of other researchers in other places in relation to the affordable housing.

6. To also confirm and compare the affordable housing in Malaysia.

7. To identify variables and concepts that appropriate for this research.

3.8 The Fieldwork

Surveys are utilised to assemble the information from a relatively large number of respondents within a constrained time allotment (Naoum, 2013). The results of the survey can be summed up to the primary populaces. The reason for the survey is to achieve the three objectives of this research. In survey method, every respondents are asked similar questions in a similar situation (Olanrewaju, 2008). The principle accentuation of this method is on facts findings (Olanrewaju, 2008). The distinctive publications and researchers in the field of affordable housing include:

1. Flexibility: it is workable for the researcher to study wide scopes of research question (Olanrewaju, 2008).

2. Circumstances can be depicted and the connection between variables can be studied (Olanrewaju, 2008).

3. The findings from the overview can be summed up to the whole populace under thought. Basically, one of the principle reasons for completing this research is to sum up the finding of the Malaysia development industry as much as practicable (Olanrewaju, 2008).

4. A lot of information can be accumulated (Olanrewaju, 2008). Since the finding from this research is to be summed up; is, consequently, turned out to be basic that an extensive amount of information must be gathered. This survey would not be exceptionally valuable if the discoveries can't be summed up.

5. It is less expensive when contrasted with other types of methodologies like the contextual analysis and test approach for this research.

6. It is snappier to lead the study (Olanrewaju, 2008). This research is for the award of master's degree and the research heavily focused on the time frame to finish within three years. Utilising other research strategies may set aside a more drawn out opportunity to finish (Olanrewaju, 2008). The survey could be directed utilising either the questionnaire or interview or both.

The Questionnaire Survey

This research, the questionnaire approach is given inclination. The questionnaire approach is believed to be fit for this research because of the following reasons:

1. The questionnaire is a savvy strategy for gathering information for survey research (Olanrewaju, 2008). Going around Malaysia to conduct an interview with architects would involve a lot of expenses. Conducting

interview through phone or online, are additionally costly when contrasted with the questionnaire approach.

2. Online interview cannot be used because majority with the internet access were busy as they are professionals; while for home users, the researcher did not have their details. In addition, the telephone numbers of the respondents are unknown.

3. It is quicker to conduct a questionnaire approach (Olanrewaju, 2008) because this research is for the award of master's degree and the research is expected to complete within the period of three years. Using other survey research methods might take a long time to complete.

4. Besides, receiving the questionnaire approach is acclimating to the respondents. This will enable respondents to finish the questionnaire at their own comfort and give them the chances to consider their sentiments.

5. The questionnaire approach enables a lot of information to be assembled in the brief time frame (Olanrewaju, 2008). The discoveries from this research are to be summed up.

6. The findings can be communicated factually, and the discoveries can be compared and contrasted with the previous findings (Olanrewaju, 2008)..

3.9 Limitations of the Questionnaire Survey

As an independent way towards regulating the questionnaire, some similar constraints hold. The restrictions were related to the questionnaire approach and being identified and described as:

1. Respondents cannot be tested (Olanrewaju, 2008). The results from the questionnaire must be fully trusted.

2. Questions regarding complex issues are hard to look at. This is on the account that the respondents' conclusion was not comprehensive (Olanrewaju, 2008).

3. No power over the respondent. The researcher has little chance to guarantee that the proposed respondents finish the questionnaire. The objective respondents may appoint their subordinates to finish the questionnaire.

4. Accuracy: the respondent could give a general response to an inquiry, though the planned reactions are particular.

3.10 Mitigating the Limitations of the Survey Approach

Survey approach towards housing industry experts

In order to ensure that targeted respondent completed the questionnaire, the researcher distributed the questionnaire at the ARCHIDEX 2016. Due to low responsive feedback, the researcher sent personal emails to the architects who are in the list of registered professional architects in the Board of Architects Malaysia to encourage them to complete the questionnaire in the 'Google Forms' format. The researcher also ensure that the questions are simple and short so that it is easy to be understood by the respondents.

The prospective respondents at the ARCHIDEX 2016 returned the questionnaire once they completed it on the same day, while the emailed respondents were given two weeks to complete the questionnaires as this will allow the willing respondents to complete the questionnaire at their convenient time. However, in relation to this problem, the difficulty was on using the available information, against waiting for reliable and accurate information that was never received. This is because a great opportunity could be missed while the researcher was waiting for information that may never come after all (Olanrewaju and Abdul-Aziz, 2014).

Cohen and Manion (1994) cited in Olanrewaju and Abdul-Aziz (2014), the limitations of the questionnaire can also be improved by avoiding leading questions. Leading questions are the questions that suggest to the respondents that there is only one acceptable way for him (Olanrewaju and Abdul-Aziz, 2014). In this questionnaire for this research, there is no one way of open-ended questions. The questions are also short. The total number of questions in the questionnaires is not more than 50. A set of the survey questionnaire will take less than thirty minutes to finish. The questionnaire listed closed-ended questions that do not require much thinking.

Survey approach towards home user

The researcher distributed the questionnaire on the selected residential high-rise buildings in Penang, by distributing the questionnaires to the residents in high-rise buildings and this required a targeted response to get an additional feedback. The researcher also ensure that the questions are simple and short so that it is easy to be understood by the respondents.

The prospective respondents at the selected residential high-rise buildings returned the questionnaire once they completed it on the same day. Cohen and Manion (1994) stated that leading questions are the questions that suggest to the respondents that there is only one acceptable way for him to answer (Olanrewaju

and Abdul-Aziz, 2014). In the questionnaire for this research, there is no one way answer of open-ended questions. The questions are also short. The total number of questions in the questionnaires is not more than 50. A set of questionnaire will take less than thirty minutes to complete. The questionnaire has closed-ended questions that do not require much thinking.

3.11   Piloting

The pilot studies were conducted for the questionnaire. This is to correct some uncertainties and check the wordings to ensure that respondents easily understand the questions in the contexts that the researcher meant it to be. The pilot studies were carried out in different stages by experts. The pilot survey was carried out by two construction experts; they are lecturers in various faculties.

The questionnaire was modified and rewarded based on the suggestions received from the two experts. Then the questionnaire was also piloted by the researcher's colleagues. The colleagues are fifteen in number pursuing either bachelor's degree or master's degree in the Faculty of Engineering and Green Technology and Lee Kong Chian Faculty of Engineering and Science, UTAR.

Based on the comments and suggestions received from these experts, further modifications were made until suitable questions and formats were achieved.

Altogether, four drafts for construction professionals and six drafts of home users were prepared before the final edition was achieved. The pilot survey took about three months before the final draft was finalised.

3.12   Method of Administering Questionnaires Survey

Questionnaires are generally administered using hand delivery and via online distribution. For the purpose of this research, hand delivery is preferred. For one reason, since the convenience sampling method is used, face-to-face hand delivery seems to be more appropriate than the postal questionnaire, because there is a possibility that the questionnaire can be collected on the same day (Olanrewaju, 2008).

Another reason is that the database containing the addresses of the respondents was not available. Using the online distribution was not a good idea as many of the respondents accessing the internet responded slowly. However, this research sent the online questionnaire survey to the housing industry experts due to low respond rate in hand delivery.

3.13   Administering the Questionnaire for this Research

The researcher could not administer the questionnaire herself due to a large number of respondents. The researcher appointed two of her colleagues, that the researcher thought capable to administer the questionnaires. The tasks of these administrators include administering the questionnaire and collecting the completed questionnaires from the respondents and to sending the completed questionnaires to the researcher. They administered both survey questionnaires.

On the 22nd July 2016, the housing industry expert questionnaires were sent via email by one of the administrators. The administrator printed the questionnaire and distributed to the researcher and the other administrator on an actual day to assist in administering the questionnaire. While for the home user, questionnaires were printed by the researcher on 24th December 2016. By approaching the respondents to complete the survey, some of the respondents were found as not willing to respond to the questionnaires.

Meanwhile, due to low response rate, the researcher also sent a copy of the housing industry expert questionnaires to the respondents by email. All along, they have been providing useful suggestions to improve the findings of the research. They are the registered member of the Board of Architects Malaysia. Two days later, one of them returned his completed questionnaire. The researcher also

requested the returned the response to assist in forwarding copies of the questionnaires to their colleagues and friends whom they believe are qualified to be included in the survey. This researcher could not ascertain on the number of their colleagues. Nearing the closing date for receiving the questionnaire, nineteen questionnaires were received. These nineteen responses were returned in the 'Google Form' format.

3.14   Survey Duration

Housing Industry Expert Questionnaire Survey

The housing industry expert questionnaire was intended to be distributed only at the ARCHIDEX 2016 which was held from 20th July 2016 to 23rd July 2016. It was attended by more than 3,000 delegates and exhibitors. This survey was conducted on 23rd July 2016 (Saturday) because only this day is opened to the public. The days before were the closed sessions, where only those paying the conference fees were allowed to attend. The researcher intended to collect about 500 completed questionnaires, but at the end of the day, there was only 96 returned completed questionnaires. Due to the poor response rate, the researcher emailed to the registered members in the Board of Architects Malaysia and hoped to receive more returned completed questionnaires. The duration of the online survey was four

weeks. Nineteen questionnaires were received from the returned 'Google Form'.

Table 3.1 shows the housing industry experts' response rate.

Table 3.1 Distribution of the Housing Industry Expert Response Rate of the Questionnaire Survey

Item	Total Sent Out	Total Respond
Questionnaires distributed for Housing Industry Expert by hand	500	96
Questionnaires distributed for Housing Industry Expert via "Google Form"	1025	19
Total Questionnaires	**1525**	**115**

Home User Questionnaire Survey

The home user questionnaires were intended to be distributed at Taman Seri Hijau, Jelutong residents, Relau Vista Apartment residents, Sri Kristal Apartment Farlim residents, Taman Kristal Apartment Tanjung Tokong residents and Menara Kuda Lari residents in Penang. This survey was conducted on 25th December 2016 to 20th January 2017. Due to poor response rate, the researcher distributed the questionnaires to an additional building by the name of Sri Pelangi Datuk Keramat residents, also located in Penang. The duration of this additional survey was from 21st January 2017 to 31st January 2017. Table 3.2 shows the home users' response rate.

Table 3.2 Distribution of the Home User Response Rate of the Questionnaire Survey

Item	Total Sent Out	Total Respond
Taman Seri Hijau	200	128
Relau Vista Apartment	180	123
Sri Kristal Apartment	180	133
Taman Kristal Apartment	100	56
Menara Kuda Lari	100	62
Sri Pelangi	100	27
Total Questionnaires	**860**	**529**

3.15   Analysis Techniques

Analysis techniques are used to analyse problems, facts or status so as to precisely forecast potential results while factoring in the project variables. The techniques are utilised to solve explicit issues in a specific errand (Project Management Knowledge, 2019). The data analysis conducted in this research are on reliability, validity, Kaiser-Meyer-Olkin (KMO), one sample t-test, descriptive statistic and factor analysis.

3.15.1 Reliability

Well and Wollack (2003) argued that reliability implies the scope of consistency of scores towards measures to get the similar results in repeated testing (Lim, 2014). The reliability test is the consistency of scores after some time. As indicated by Miller, there are three parts of reliability such as internal consistency, equivalence

and stability. The internal consistency reliability or homogeneity was led to test the reliability and consistency of the results of data in the research (Lim, 2014).

Cronbach's alpha was the most common statistical index used in the internal consistency reliability test. Cronbach's alpha is to interpret and explain the reliability among the variable surveyed. Besides, Cronbach's alpha is ideally utilised when there was a presence of multiple five-point Likert scale questions in the questionnaire. Furthermore, the Cronbach's alpha coefficient is ranged from 0.0 to 1.0 and it is utilised to check whether the built construct is dependable or not. There is no lower breaking point to the coefficient. In addition, the value of coefficients which is near to 1.0 in Cronbach's alpha means a high consistency for the outcome. George and Mallery (2003) and Hair et al. (2009) proposed that 0.70 is the most adequate and reasonable cut-off point for the Cronbach's alpha value (Lim, 2014).

Table 3.3 demonstrates the dependable guidelines about Cronbach's alpha for the internal reliability test developed by George and Mallery (2003).

Table 3.3 Rules of Thumb for Internal Reliability Test

Cronbach"s Alpha	Internal Consistency
$1.0 > \alpha > 0.9$	Excellent (High-stakes testing)
$0.9 > \alpha > 0.8$	Good (Low-Stakes testing)
$0.8 > \alpha > 0.7$	Acceptable
$0.7 > \alpha > 0.6$	Questionable
$0.6 > \alpha > 0.5$	Poor
$0.5 > \alpha > 0.0$	Unacceptable

(Source: Cortina, 1993)

3.15.2 Validity

In contrast to reliability that measure the content of the measures, validity measures the correctness and truthfulness of the measure. Therefore, to ensure this, the research instruments must measure accurately. Punch (1998) noted that an indicator is valid to the degree that it empirically represents the concept it purports to measure (Olanrewaju, 2008). Improving the research method will lead to the valid result. Piloting is one of the ways of validating research instruments in order for the instrument to measure what it supposes to measure correctly. Miles and Huberman (1994) argued that the validity of the instrument could be increased by recording data correctly and cross-checking of data (Olanrewaju, 2008). Hammersely and Atkinson (1995) asserted that the essence of triangulation is to counteract various possible threats to the validity of the analysis (Olanrewaju, 2008).

There are different ways of evaluating the validity of an instrument, namely, concurrent and predictive and face validity. The concurrent validity is the ability of the instrument to differentiate who is known to differ. Predictive validity is the ability of the instrument to measure future differences. The face validity is the ability of an instrument to be evaluated by groups of experts who read or look to ensure that the instrument is able to measure what is supposed to measure. Only the face validity is consistent with the requirement of this research and this will be achieved by piloting the questionnaires as explained in section 3.11.

3.15.3 Kaiser-Meyer-Olkin (KMO)

Nourusis (2003) asserted that the KMO Measure of Sampling Adequacy is the aggregate of all the squared correlation coefficients in the numerator and the denominator is the total of all the squared correlation coefficients in addition to the total of the majority of the squared partial correlation coefficients (Robert and William, 2018). Hair (1995) asserted that a partial correlation is an esteem that measures the quality of the connection between a needy factor and a solitary independent factor when the impacts of other autonomous factors are held consistent (Robert and William, 2018).

Kaiser (1974) asserted that the KMO index, specifically, is prescribed when the cases to factor ratio are less than 1:5. The KMO index ranges from 0 to 1, with

77

0.50 is thought to be reasonable for factor analysis. The accompanying criteria are utilised to assess and describe the sampling adequacy (Robert and William, 2018) as shown in Table 3.4.

Table 3.4 KMO Index and Descriptions of the Sampling Adequacy

KMO Index	Descriptions
0.90	Marvelous
0.80	Meritorious
0.70	Middling
0.60	Mediocre
0.50	Miserable
Below 0.50	Unacceptable

(Source: Robert and William, 2018)

According to Hair et al. (1995), Bartlett's Test of Sphericity should be significant (p<0.05) for factor analysis to be suitable (Robert and William, 2018).

3.15.4 One Sample T-Test

The one sample t-test is a measurement methodology used to decide if a sample of perceptions could have been created by a process with a specific meaning (Statistics Solutions, 2018). There are two categories of hypotheses for one sample t-test; the null hypothesis and the alternative hypothesis.

When the result shows 0.000 for p-value, it means the variable is significant (Hr: $U > U_0$). Therefore, the alternative hypothesis is accepted and the null hypothesis is rejected. On the other hand, if the p-value is more than 0.05, the null hypothesis is accepted and the alternative hypothesis is rejected.

3.15.5 Descriptive Statistic

Descriptive statistics are brief expressive coefficients that condense a given data collection, which can be either a picture of the whole population or a sample of it. Descriptive statistics are separated into measures of variability or spread and measures of central tendency. Descriptive statistics measures include the mode, median and mean, while measures of variability include the minimum and maximum variables, the kurtosis and skewness, and the standard deviation or variance (Investopedia, 2018).

3.15.6 Factor Analysis

Factor analysis is a complex procedure with few absolute guidelines and many options (Castello and Jason, 2005). Data properties, study design, and the questions to be addressed all have an orientation on which methods will yield the greatest advantage (Castello and Jason, 2005). There are several types of factor analysis

extraction methods to choose from SPSS, SAS and other statistical software packages. There are six types of factor analysis extraction methods; generalised least squares, unweighted least squares, maximum likelihood, principal axis factoring, alpha factoring, and image factoring (Castello and Jason, 2005).

Many popular statistical software packages, including SPSS and SAS, PCA (principal components analysis) are the extraction in which also contribute to their popularity (Castello and Jason, 2005). Principal component analysis is most suitable to be used in this research. Observations are described by several inter-correlated quantitative dependent variables and is a multivariate technique that analyses a data table by using the principal component analysis (PCA) (Memon et al., 2014). Its goal is to extract the important data from the table, to signify it as a combination of new statistical variables called principal components, and to display the outline of similarity of the research and of the variables as pointed in the table. The quality of the PCA model can be assessed utilising cross-validation techniques, for example, the bootstrap and the jackknife (Memon et al., 2014).

All the factor loading must be within the specified weight of more than 0.40 and the factors must have a minimum of two variables (Olanrewaju and Tan, 2017). James (2006) and Pett et al. (2003) asserted a variable is suitable if it contributes up to 0.4 onto a factor which is contended by most authors (Olanrewaju, 2017).

Conversely, Pituch and Stevens (2015) asserted that 0.3 is adequate to reflect a variable as significant in a model (Olanrewaju and Tan, 2017).

3.16   Questionnaire Design

Prior to designing this questionnaire, extensive literature was undertaken. However, for the purpose of this section, literature reviews were conducted in order to identify that the questionnaires relate to this research's aim and objectives. That could be adapted to suit the Malaysian affordable housing. However, the attempt failed. The identified questionnaires were in different countries and more importantly, they were designed to achieve different aims and objectives as well as for different research questions. Therefore, the researcher designed a new questionnaire that would achieve the research's aim and objectives (Survey questionnaires are shown in Appendix E and Appendix F).

3.16.1 Housing Industry Expert Survey

The questionnaire for housing industry expert was divided into three parts, spread on three pages of A4-sized paper. Each part is designed to achieve a particular objective. These parts are:

Part 1: Respondent's profiles

Part 2: Determine the factors that will cause Malaysian housing prices to increase

Part 3: Determine the construction materials that has the highest risk of unstable supply during construction

Part one contained the question to elicit information that relates to the respondent's background (Olanrewaju, 2008). Part one contains eight questions. The question in this part is generally closed-ended questions, but provisions are made, in case none of the options provided is appropriate for the respondent.

The objective part two is to analyse the factors that cause the Malaysian housing prices to increase. Based on the literature reviews, 21 variables that may cause the Malaysian housing prices to increase were identified. The respondents were asked to express their opinion on the variables that will cause the Malaysian housing prices to increase. Each of these variables is measured using a questionnaire. Respondents were requested based on their experience to classify each of the techniques according to five-point Likert scale of:

      a.   Strongly Agree;

      b.   Agree;

      c.   Slightly Agree;

d.   Disagree;

e.   Strongly Disagree

The objective of part three is to analyse the extent of availability of construction materials. Based on literature reviews, 14 variables that will face unstable supply during construction were identified. These variables were posed to the respondents. The respondents were requested to tick each variable based on a Likert's scale five-point continuums:

a. Extremely Shortage;

b. High Shortage;

c. Shortage;

d. Low Shortage;

e. Very Low Shortage

3.16.2 Home User Survey

The questionnaire for the home user was divided into two parts, spread on three pages of A4-sized paper. Each part was designed to achieve a particular objective. These parts are:

Part 1: Respondent's profiles

Part 2: Determine the factors determining the demand for affordable housing

Part one contains 19 questions. The questions were generally close-ended questions, but provisions were made, in case none of the options provided is appropriate for the respondent.

The objective of the second part is to analyse the factors determining the demand for affordable housing. Based on literature reviews, 21 variables that will determine the demand for affordable housing in Malaysia were identified. The respondents were requested to express their opinion on the variables that will determine the demand for affordable housing in Malaysia. Each of these variables was measured using a questionnaire. Respondents were asked based on their point of view to classify each of the techniques according to the five-point Likert's scale of:

a. Extremely Important;

b. Very Important;

c. Important;

d. Low Important;

e. Very Low Important

3.17   Summary

The convenience sampling methods were used in this research because there are tight deadlines and time constraint. The survey approach towards housing industry expert and the questionnaires were distributed at the ARCHIDEX 2016 and through 'Google Forms'. Besides the home users, the questionnaires were also distributed to the selected residential high-rise buildings in Penang. The data analysis conducted were reliability, validity, KMO, standard deviation, mean, one sample t-test and factor analysis.

CHAPTER 4

DATA ANALYSIS AND RESULTS

4.1 Introduction

This chapter concerned with the data analyses and presentations of results as well as discussions on the research findings. This chapter is presented in accordance with the two sets of questionnaire designs which are the housing industry expert survey and home user survey, each was divided into three and two parts respectively.

The part one of the housing industry expert questionnaire presents the respondents' profiles. Univariate analysis of the data, through mode is computed to determine the frequency of the respondent's particulars. Part two is to analyse the factors causing affordable housing prices to increase. The factor analysis is used to analyse the factors causing affordable housing prices to increase. Part three is to analyse the extent of availability of construction materials. Ranking is used to analyse the extent of availability of construction materials.

The part one of the home user questionnaire presents the respondents' profiles. Univariate analysis of the data, through mode is computed to determine the frequency of the respondent's particulars. Part two is to analyse the factors determining the demand for affordable housing. The factor analysis is used to analyse the factors determining the demand for affordable housing.

Generally, cross-tabulation and t-test are used to analyse the significance of relationships between the variables or criteria or as the case might be. The significance level may be interpreted as indicators of strength in relationships. The lower the significance level shows the stronger connection between the variables or criteria. When the significance level of a test coefficient, p where $p<0.0001$, the t-test is considered extremely strong; when the significance level $0.001<p<0.01$, it is considered fairly strong, and it is weak when $0.01<p<0.05$. The relationship is considered weak when the significance level of the test coefficient is $p>0.05$ (Zavadskas and Vilutiene, 2006).

The Cronbach's alpha of variables is also computed to analyse the reliability of the variables. A reliability test of more than 0.90 is statistically considered excellent; 0.70 to 0.90 is high, 0.50 to 0.70 is moderate, and below 0.50 depicts a low reliability rate of the variables.

Factor analysis of the variables is computed to multiple observe of the variables whether having similar patterns of responses. Factor loadings of 0.3 to 0.4 are minimally accepted.

4.2 Results of Housing Industry Expert Survey

A total of 500 questionnaires were distributed for housing industry expert at the ARCHIDEX 2016. Ninety-six questionnaires were returned and completed. 1025 questionnaires were distributed for housing industry experts via "Google Form" but only 19 completed questionnaires were returned. This is 7.54 per cent (115 of 1525) response rate. Table 4.1 shows the distribution of the housing industry expert response rate of the questionnaire survey and Figure 4.1 shows the distribution of the housing industry expert total response rate of the total questionnaires sent out for the survey. The response rate is considered low for this research to be reported. According to Holbrook et al. (2005), five per cent to 54 per cent response rate have presumed that a research with a much lower response rate were less accurate than those with substantially higher response rate (Morton et al., 2012). According to Morton et al. (2012), low response rate does not naturally mean the research results have low validity, they just show a possibly greater risk.

Table 4.1 Distribution of the Housing Industry Expert Response Rate of the Questionnaire Survey

Item	Total Sent Out	Total Respond
Questionnaires distributed for Housing Industry Expert by hand	500	96
Questionnaires distributed for Housing Industry Expert via "Google Form"	1025	19
Total Questionnaires	**1525**	**115**

Figure 4.1 Distribution of the Housing Industry Expert Total Respond Rate of the Total Sent Out for the Survey

4.2.1   Part One: Respondents' Profiles

Eight questions were addressed to the respondents in order to elicit information on their profiles. Specifically, this part seeks to identify the respondents' professional background, academic qualifications, professional qualifications and the respondents' organisations. In addition, it seeks to identify the respondents'

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positions in their workplace and working experience, their experience in affordable

housing as well as their nationalities.

The data analyses found that the majority at 48.7 per cent of the respondents

completed the questionnaires possess a bachelor's degree; while about 35 per cent

hold a master's degree a shown in Table 4.2. Nearly 14 per cent possess a diploma.

Only three of the respondents hold Sijil Pendidikan Malaysia (SPM).

Table 4.2 Distribution of Respondents by Their Highest Academic Qualification

Highest Academic Qualification	Number Received	Percentage (%)
Bachelor Degree	56	48.7
Master Degree	40	34.8
Diploma	16	13.9
Sijil Pendidikan Malaysia	3	2.6
Total	**115**	**100**

The data also revealed that among bachelor's degree holders, 30 of them are

architects, while 10 are engineers. Whereas among the master's degree holders, 34

of them are architects, while four are engineers. While five of the diploma holders

are architect. Table 4.3 shows the cross-tabulation between professional

background and academic qualifications.

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Table 4.3 Cross-Tabulation between Professional Background and Academic Qualifications

Item	SPM	Diploma	Bachelor Degree	Master Degree	Total
Architect	0	5	30	34	69
Engineer	0	0	10	4	14
Quantity Surveyor	0	5	1	0	6
Land Surveyor	0	0	2	0	2
Others	3	6	13	2	24
Total	**3**	**16**	**56**	**40**	**115**

Majority 60 per cent of the respondents are architects while about 12 per cent of them are engineers. Five per cent of them are quantity surveyors while about two per cent of the respondents are land surveyors. About 21 per cent of the respondents belong to other professional backgrounds. Figure 4.2 shows the distribution of the respondents by their professional background.
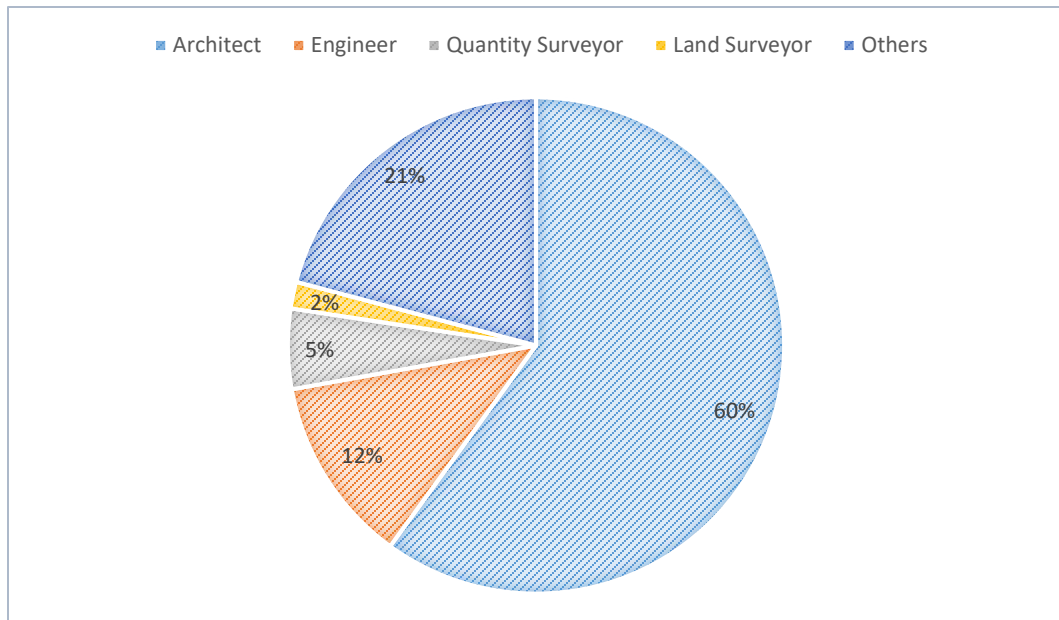
Figure 4.2 Distribution of the Respondent by Their Professional Background

The cross-tabulation in Table 4.4 showing the professional background and duration of working experience (in years) suggests that the majority at 65.3 per cent

respondents with less than five-year working experience are the architects. On the other hand, that has the most at 61.5 per cent with ten years to fifteen years of working experience are in the field of development, construction and construction management. Predominantly 76.2 per cent, those with more than twenty years of working experience are the architects.

Table 4.4 Cross-Tabulation between Professional Background and Duration of Working Experience (in Years)

Professional Background	Respondents' Working Experience					Percentage of the Total Respondents
	Less than 5 years	5 - 10 years	10 - 15 years	15 - 20 years	More than 20 years	
Architect	65.3%	50.0%	38.5%	50.0%	76.2%	60.0%
Engineer	10.2%	27.3%	0.0%	0.0%	14.3%	12.2%
Quantity Surveyor	10.2%	0.0%	0.0%	10.0%	0.0%	5.2%
Land Surveyor	0.0%	9.1%	0.0%	0.0%	0.0%	1.7%
Others	14.3%	13.6%	61.5%	40.0%	9.5%	20.9%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

On the basis of their professional membership, nearly 54 per cent of the respondents are the members of Board of Architect Malaysia. Besides, 17.4 per cent of the respondents are yet to register; therefore they do not belong to any professional bodies and do not hold any professional qualifications. Twelve per cent of the respondents that completed the questionnaires are REHDA members while 11.3 per cent of them are members of the Board of Engineers Malaysia. Only 3.5 per cent is the member of the Board of Surveyors Malaysia and 1.7 per cent are the member of Building Materials Distributors of Association of Malaysia. Table 4.5 shows the distribution of respondents by their professional memberships.

Table 4.5 Distribution of Respondents by Their Professional Membership

Membership	Number Received	Percentage (%)
Board of Architects Malaysia	62	53.9
REHDA - Real Estate and Housing Developers' Association Malaysia	14	12.2
Board of Engineers Malaysia	13	11.3
Board of Surveyor Malaysia	4	3.5
Building Materials Distributors of Association of Malaysia	2	1.7
Do not have professional membership	20	17.4
Total	**115**	**100.0**

Though many of the respondents are yet to register, this does not affect the quality of these research outcomes. Possessing the professional qualification does not necessarily become a requirement for employment and does not necessarily connote an employee's level of experience in the Malaysian construction industry. Possessing the professional qualification is only a mandatory requirement for establishing a consultancy, wherein the partners are required to be a registered member of their professional bodies. The other staff, either in junior or senior categories need not to be the registered members. In fact, many of those working are not registered members of their professional bodies. Nonetheless, it is an added advantage when seeking employment in some cases.

From Table 4.6, the cross-tabulation between professional background and their professional membership found that the majority at 98.4 per cent of the Board of Architects Malaysia are the architects and the majority of the REHDA members are in other categories which are development, construction and construction management.

Table 4.6 Cross-Tabulation between Professional Background and Their Professional Membership

Professional Background	REHDA - Real Estate and Housing Developers' Association Malaysia	Building Materials Distributors of Association of Malaysia	Board of Surveyor Malaysia	Board of Architects Malaysia	Board of Engineers Malaysia	Do not have professional membership	Total
Architect	31.3%	0.0%	0.0%	98.4%	0.0%	15.0%	60.0%
Engineer	18.8%	0.0%	0.0%	0.0%	84.6%	0.0%	12.2%
Quantity Surveyor	0.0%	0.0%	0.0%	0.0%	0.0%	30.0%	5.2%
Land Surveyor	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	1.7%
Others	50.1%	100.0%	0.0%	1.6%	15.4%	55.0%	20.9%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Majority 69.6 per cent of the respondents are private firm employees, while 10.4 per cent of them are working at developer firms. Nearly eight per cent of the respondents are working in the construction material supply company, while 6.1 per cent of them are working in consultancy firms which are architecture, engineering, quantity surveying consulting firms or consulting companies. Nearly four per cent of the respondents are government employees. About three per cent of the respondents are working with contracting firms. Table 4.7 shows the distribution of the respondents by their organisations.

Table 4.7 Distribution of the Respondents by Their Organisation

Organisation	Number Received	Percentage (%)
Private Firm	80	69.6
Developer	12	10.4
Supplier	9	7.8
Consultancy Firm	7	6.1
Government	4	3.5
Contractor	3	2.6
Total	**115**	**100.0**

Majority at 35.7 per cent of the respondents are architects while 13.1 per cent of them are in the other category which are development, construction and construction management. Nearly nine per cent of them are chief executive officers while eight of them are the clerks at work. About six per cent of the respondents are the directors of the companies and another six per cent are managers. About five per cent of the respondents are senior architects while 3.5 per cent are construction managers. Nearly three per cent of the respondents are project managers, while 0.9 per cent of them are drafters and another 0.9 per cent are

contract managers. Table 4.8 shows the distribution of the respondents by their positions.

Table 4.8 Distribution of the Respondents by Their Position

Current Occupied Position	Number Received	Percentage (%)
Architect	41	35.7
Engineer	12	10.4
Chief Executive Officer	10	8.7
Clerk of Work	8	7.0
Director	7	6.1
Manager	7	6.1
Senior Architect	6	5.2
Construction Manager	4	3.5
Project Manager	3	2.6
Drafter	1	0.9
Contract Manager	1	0.9
Others	15	13.1
Total	**115**	**100.0**

Table 4.9 indicates the working experience possessed by the respondents; 42.6 per cent of them have less than five years working experience while 19.1 per cent of them have from five up to ten years working experience. Nearly 14 per cent of them have worked for ten to fifteen years. About nine per cent have fifteen up to twenty years of working experience. The remaining respondents have more than twenty years of working experience.

Table 4.9 Distribution of the Respondents' Working Experience

Working Experience	Number Received	Percentage (%)
Less than 5 years	49	42.6
5 - 10 years	22	19.1
10 - 15 years	13	11.3
15 - 20 years	10	8.7
More than 20 years	21	18.3
Total	**115**	**100.0**

Majority at 97.4 per cent of the respondents are Malaysians and only 2.6 per cent of the respondents are expatriates. Table 4.10 shows the distribution of the respondents' nationalities

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Table 4.10 Distribution of the Respondents' Nationalities

Nationality	Number Received	Percentage
Malaysian	112	97.4
Non-Malaysian	3	2.6
Total	**115**	**100.0**

From Table 4.11 cross-tabulation between professional background and nationalities, it is found that one of the foreigners is an architect; one is an engineer and one involves in development, construction or construction management field. However, it is expected that foreigners to be an architect or engineer in Malaysia, because there are several construction companies in Malaysia that are wholly or partly owned by the expatriates. One of the major reasons for this is due to foreign construction technologies are much advanced. Therefore, many construction companies hire foreigner professionals to monitor their company. However, in this research, the respondents are mainly Malaysians.

Table 4.11 Cross-Tabulation between Professional Background and Nationalities

Professional Background	Nationality		Total
	Malaysian	**Non-Malaysian**	
Architect	68	1	69
Engineer	13	1	14
Quantity Surveyor	6	0	6
Land Surveyor	2	0	2
Others	23	1	24
Total	**112**	**3**	**115**

About 55 per cent of the respondents have involved in "affordable housing" design or construction, while 45.2 per cent of them have not being involved in "affordable housing" design or construction. Figure 4.3 shows the distribution of the respondents involved in "affordable housing". Among the 63 respondents who have been involved in "affordable housing" design or construction, the projects are PR1MA, PPA1M, RMM SPNB, RMM Sarawak, Rumah Selangorku, MyHome, My First Home Scheme, Housing Loan Schemes, People's Housing Program and LPPB low-cost housing in Sabah.
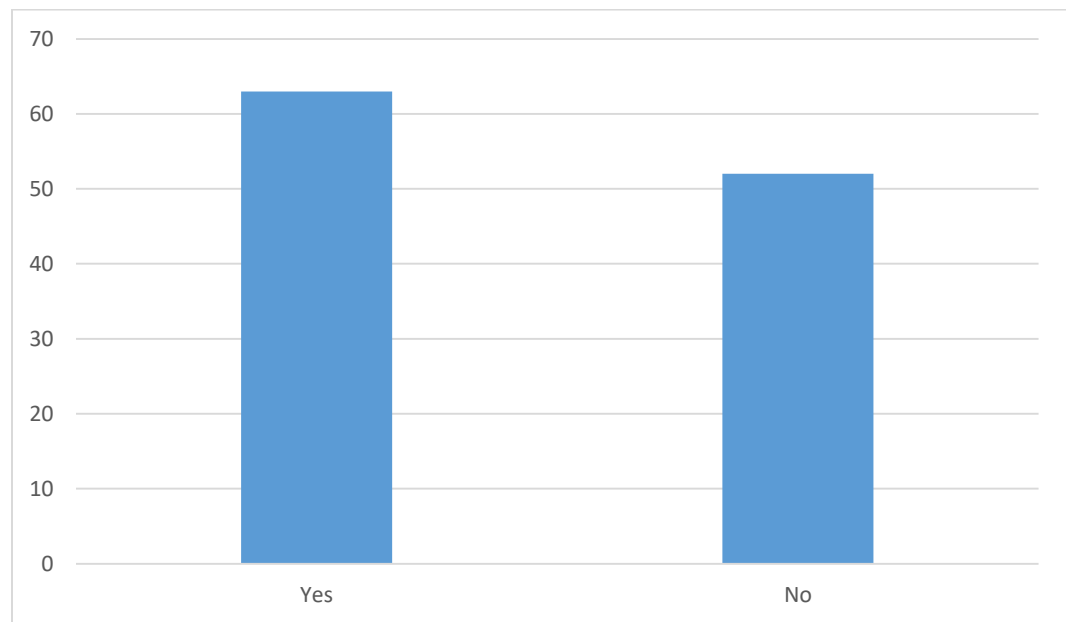
Figure 4.3 Distribution of the Respondent by Involve "Affordable Housing"

4.2.1.1 Summary of the Respondents' Profiles

From analysis in Table 4.13 on the respondents' profile, it is clear that majority of the respondents possess bachelor's degree in the construction-related disciplines.

More than 50 per cent of the respondents have more than five years of working experience in construction industry. Five years working experience in an environment is considered adequate for the respondents to possess minimum knowledge of the Malaysian construction industry. The analysis revealed that 35.7 per cent are holding the architect position in their respective organisations. Therefore, on the basis of the respondents' profiles, it is considered that their opinions on the Malaysia construction industry are sufficient to report the findings of this research.

Table 4.12 Distribution of the Respondents Profile: Summary

Questions	Categories	Frequencies	Percentage
Highest Academic Qualifications	Bachelor Degree	56	48.7
Professional Background	Architect	69	60.0
Membership	Board of Architects Malaysia	62	53.9
Organisations	Private Firm	80	69.6
Positions	Architect	41	35.7
Working Experience	More than 5 years	66	57.4
Nationality	Malaysian	112	97.4

4.2.2   Part Two: Factors Causing Malaysia Housing Price to Increase

This section seeks to analyse the factors that will cause the Malaysian housing price to increase. There are 21 factors causing the Malaysian housing price to increase. However, before the main analysis, the reliability analysis and validity test were

carried out to determine the strength of the data. Then, the KMO, one sample t-test and factor analysis were also conducted.

4.2.2.1 Reliability Analysis of Factors Causing Malaysia Housing Price to Increase

The results in Table 4.13 shows the Cronbach's alpha value in this survey was 0.814, so it proved that all the factors are consistent and the repeatable of measure is in a very good range for this research.

Table 4.13 Reliability of Factors Cause Malaysia Housing Price to Increase

Cronbach's Alpha	N of Items
0.814	21

Table 4.14 shows that the Cronbach's alpha value for each of the factors will cause the Malaysian housing price to increase. The results range from 0.794 to 0.829. The layout of the house and currency exchange rate accounted the lowest Cronbach's alpha value of 0.794 while climate changes constituted the highest value of 0.829. Each of the factors that caused the Malaysian housing price to increase in this study contained good Cronbach's alpha values, therefore, it was satisfactory, and proved all the factors to have high consistency and are reliable.

Table 4.14 Item-Total Statistic of Factors Cause Malaysia Housing Price to Increase

Factor	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Shortage of Material	56.4261	76.755	0.153	0.817
Quality of Material & Component Use	56.1391	75.244	0.310	0.810
Strategic Factors	56.4522	76.127	0.325	0.810
Location – Urban/Rural	56.9217	77.389	0.211	0.813
Availability Facilities	55.8957	71.814	0.368	0.808
Size of the House	56.5565	76.828	0.229	0.813
Leasehold / Freehold House	56.1304	71.465	0.559	0.799
Layout of the House	55.4957	67.270	0.576	0.794
Stamp Duty	55.4261	68.071	0.547	0.796
Permit Fees	55.3565	68.302	0.568	0.795
Currency Exchange Rate	55.4174	66.035	0.567	0.794
Households confidence on future price	56.0783	72.897	0.329	0.810
Interest rates	56.1043	72.094	0.443	0.803
Planning restriction on the use of land	56.1565	74.730	0.411	0.806
Developers' profit margin	56.5391	77.409	0.115	0.819
Number of new houses being built	56.0087	74.781	0.360	0.808
Geographical factors	55.9739	71.499	0.499	0.801
Rising labour costs	56.1739	68.636	0.585	0.795
Economic uncertainty and financial risks	56.1739	69.654	0.538	0.798
Innovation and skills	56.5478	77.338	0.141	0.817
Climate changes	56.1130	80.908	-0.115	0.829

4.2.2.2 Validity Test of Factors Cause Malaysia Housing Price to Increase

The outcomes of validity test by using Communalities are shown in Table 4.15. The

resulting value is 0.489 (strategic factors) to 0.901 (rising labour costs).

Table 4.15 Communalities of Factors Cause Malaysia Housing Price to Increase

Factor	Initial	Extraction
Shortage of Material	1.000	0.742
Quality of Material & Component Use	1.000	0.625
Strategic Factors	1.000	0.489
Location – Urban/Rural	1.000	0.593
Availability Facilities	1.000	0.793
Size of the House	1.000	0.813
Leasehold / Freehold House	1.000	0.826
Layout of the House	1.000	0.882
Stamp Duty	1.000	0.859
Permit Fees	1.000	0.888
Currency Exchange Rate	1.000	0.774
Households confidence on future price	1.000	0.598
Interest rates	1.000	0.559
Planning restriction on the use of land	1.000	0.748
Developers' profit margin	1.000	0.790
Number of new houses being built	1.000	0.708
Geographical factors	1.000	0.860
Rising labour costs	1.000	0.901
Economic uncertainty and financial risks	1.000	0.872
Innovation and skills	1.000	0.755
Climate changes	1.000	0.757

4.2.2.3 Kaiser-Meyer-Olkin (KMO) of Factors Cause Malaysia Housing Price to Increase

The value of KMO and Bartlett's test displayed in the Table 4.16 was 0.720 and 0.000 respectively which are greater than 0.6 and less than 0.05.

Table 4.16 Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Factors Cause Malaysia Housing Price to Increase

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.720
Bartlett's Test of Sphericity	Approx. Chi-Square	1438.685
	df	210
	Sig.	0.000

4.2.2.4 One sample T-Test of Factors Cause Malaysia Housing Price to Increase

The results of the factors analysed by one sample t-test are indicated in Table 4.17. For each factor, the null hypothesis presented that the factors will not cause increase in housing price (H_0: $U=U_0$) while the alternative hypothesis was that the factors will cause an increase in housing price (H_r: $U>U_0$). The test value used in this test is 1.5 which means the population mean U_0 is 1.5 and the determinant $= 1.303E\text{-}006$. From the results, all factors indicate the p-value of 0.000 which means those factors are significant (H_r: $U>U_0$). So that, the alternative hypothesis will be accepted and

the null hypothesis is rejected. Thus, those factors are able to stand as the factors

causing affordable housing pricing to increase.

Table 4.17 One Sample T-Test of Factors Cause Malaysia Housing Price to Increase

Factors	Test Value = 1.5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Shortage of Material	12.030	114	0.000	0.97826	0.8172	1.1394
Quality of Material & Component Use	18.015	114	0.000	1.26522	1.1261	1.4043
Strategic Factors	17.134	114	0.000	0.95217	0.8421	1.0623
Location – Urban/Rural	8.968	114	0.000	0.48261	0.3760	0.5892
Availability Facilities	14.759	114	0.000	1.50870	1.3062	1.7112
Size of the House	13.999	114	0.000	0.84783	0.7278	0.9678
Leasehold / Freehold House	16.718	114	0.000	1.27391	1.1230	1.4249
Layout of the House	17.289	114	0.000	1.90870	1.6900	2.1274
Stamp Duty	18.330	114	0.000	1.97826	1.7645	2.1921
Permit Fees	19.925	114	0.000	2.04780	1.8440	2.2510
Currency Exchange Rate	16.220	114	0.000	1.98696	1.7443	2.2296
Households confidence on future price	13.607	114	0.000	1.32609	1.1330	1.5192
Interest rates	15.160	114	0.000	1.30000	1.1301	1.4699
Planning restriction on the use of land	20.269	114	0.000	1.24783	1.1259	1.3698
Developers' profit margin	10.896	114	0.000	0.86522	0.7079	1.0225
number of new houses being built	20.503	114	0.000	1.39565	1.2608	1.5305
Geographical factors	17.127	114	0.000	1.43043	1.2650	1.5959
Rising labour costs	12.619	114	0.000	1.23043	1.0373	1.4236
Economic uncertainty and financial risks	12.934	114	0.000	1.23043	1.0420	1.4189
Innovation and skills	11.860	114	0.000	0.85652	0.7134	0.9996
Climate changes	15.852	114	0.000	1.29130	1.1299	1.4527

4.2.2.5 Descriptive Statistic of Factors Cause Malaysia Housing Price to Increase

The frequency of the respondents on the different perception of the factors causing the Malaysian housing price to increase is presented in Table 4.18. 6.54 per cent of the respondents strongly agree, 36.85 per cent agree and 31.80 per cent slightly agree. This means that 75.20 per cent of the respondents agree on these factors which caused the Malaysian housing price to increase.

Table 4.18 Descriptive Statistic of Factors Cause Malaysia Housing Price to Increase

Factors	Strongly Agree	Agree	Slightly Agree	Disagree	Strongly Disagree
Shortage of Material	7	66	24	16	2
Quality of Material & Component Use	6	30	65	13	1
Strategic Factors	2	63	46	4	0
Location – Urban/Rural	18	83	12	2	0
Availability Facilities	13	25	29	44	4
Size of the House	10	56	48	1	0
Leasehold / Freehold House	0	54	33	28	0
Layout of the House	3	29	29	26	28
Stamp Duty	5	18	38	25	29
Permit Fees	3	17	38	28	29
Currency Exchange Rate	8	24	23	24	36
Households confidence on future price	12	38	23	42	0
Interest rates	9	35	41	30	0

Table 4.18 Descriptive Statistic of Factors Cause Malaysia Housing Price to Increase (Cont'd)

Factors	Strongly Agree	Agree	Slightly Agree	Disagree	Strongly Disagree
Planning restriction on the use of land	6	24	79	5	1
Developers' profit margin	12	63	28	10	2
Number of new houses being built	3	28	62	22	0
Geographical factors	3	41	32	39	0
Rising labour costs	14	40	24	37	0
Economic uncertainty and financial risks	13	40	27	35	0
Innovation and skills	11	61	35	7	1
Climate changes	0	55	32	25	3

4.2.2.6 Ranking of Factors Cause Malaysia Housing Price to Increase

The factors causing the Malaysian housing price to increase ranked by 115 respondents are described in Table 4.19. According to the table, the mean ranging from 1.9826 to 3.548 with the factors of permit fees shows the highest mean value while location accounted for the lowest mean value. Moreover, the total average of mean and the standard deviation are 2.805 and 0.902 respectively.

Table 4.19 Ranking of Factors Cause Malaysia Housing Price to Increase

Factor	Mean	Standard Deviation	Rank
Location – Urban/Rural	1.9826	0.57709	1
Size of the House	2.3478	0.64947	2
Innovation and skills	2.3565	0.77450	3
Developers' profit margin	2.3652	0.85153	4
Strategic Factors	2.4522	0.59594	5
Shortage of Material	2.4783	0.87206	6
Rising labour costs	2.7304	1.04564	7
Economic uncertainty and financial risks	2.7304	1.02016	8
Planning restriction on the use of land	2.7478	0.66019	9
Quality of Material & Component Use	2.7652	0.75313	10
Leasehold / Freehold House	2.7739	0.81715	11
Climate changes	2.7913	0.87355	12
Interest rates	2.8000	0.91957	13
Households confidence on future price	2.8261	1.04513	14
number of new houses being built	2.8957	0.72998	15
Geographical factors	2.9304	0.89562	16
Availability Facilities	3.0087	1.09621	17
Layout of the House	3.4087	1.18392	18
Stamp Duty	3.4783	1.15734	19
Currency Exchange Rate	3.4870	1.31366	20
Permit Fees	3.5480	1.10220	21

4.2.2.7 Factor Analysis of Factors Cause Malaysia Housing Price to Increase

Factor analysis is used to determine the potential factors of a given list of measurable variables (Chai, 2017). In this research, the measurable variables are the factors causing the Malaysian housing price to increase used in the questionnaire survey.

4.2.2.7.1   Total Variance Explained

Table 4.20 shows seven components were extracted from the analysis and the eigenvalues of these seven components is greater than 1, which was accepted in the analysis. The total percentage of variance explained by Component 1 to Component 7 was 25.941 per cent, 15.832 per cent, 10.044 per cent, 6.971 per cent, 6.072 per cent, 5.754 per cent and 4.765 per cent respectively. Besides, the cumulative of variance of these seven components explained that 75.378 per cent is considered acceptable.

Table 4.20 Total Variance Explained of Factors Cause Malaysia Housing Price to Increase

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.448	25.941	25.941	5.448	25.941	25.941	3.751	17.861	17.861
2	3.325	15.832	41.773	3.325	15.832	41.773	3.247	15.460	33.321
3	2.109	10.044	51.817	2.109	10.044	51.817	2.684	12.779	46.100
4	1.464	6.971	58.787	1.464	6.971	58.787	1.713	8.158	54.258
5	1.275	6.072	64.859	1.275	6.072	64.859	1.624	7.735	61.993
6	1.208	5.754	70.613	1.208	5.754	70.613	1.535	7.310	69.303
7	1.001	4.765	75.378	1.001	4.765	75.378	1.276	6.075	75.378
8	0.889	4.235	79.613						
9	0.826	3.933	83.547						
10	0.630	2.999	86.545						
11	0.549	2.613	89.158						
12	0.477	2.271	91.429						
13	0.386	1.839	93.268						
14	0.314	1.495	94.764						

**Table 4.20 Total Variance Explained of Factors Cause Malaysia Housing
Price to Increase (Cont'd)**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
15	0.287	1.365	96.129						
16	0.222	1.059	97.188						
17	0.178	0.849	98.037						
18	0.145	0.688	98.725						
19	0.127	0.606	99.331						
20	0.073	0.349	99.680						
21	0.067	0.320	100.000						
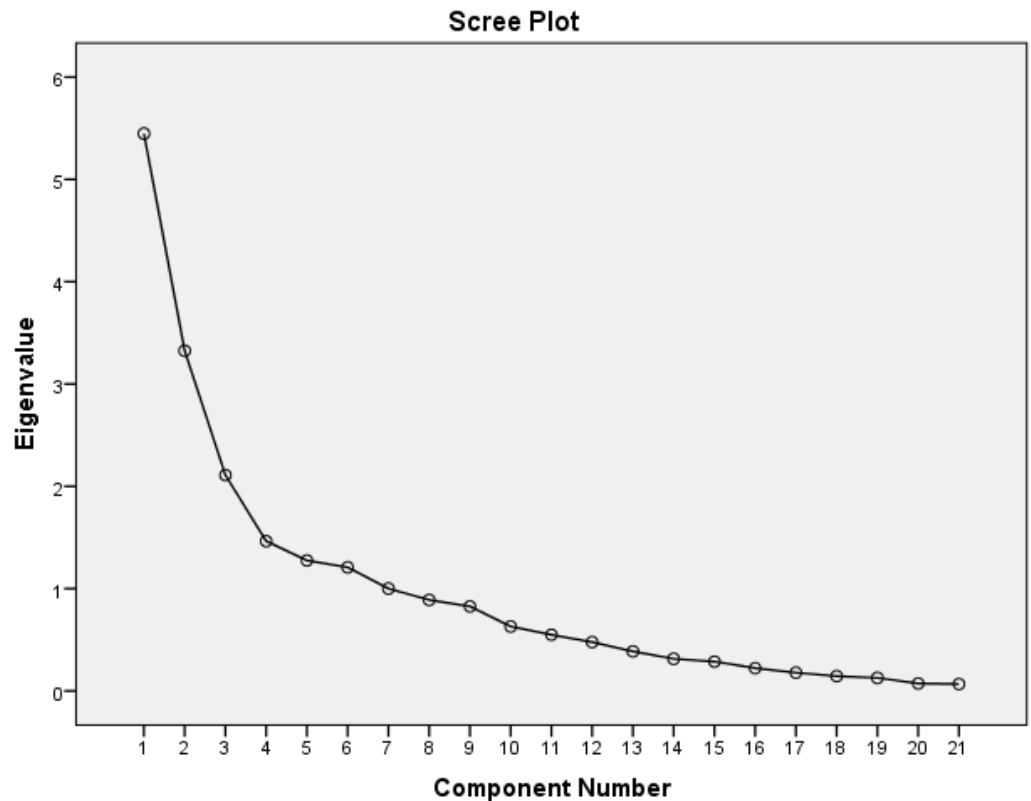
Figure 4.4 Screen Plot of Factors Cause Malaysia Housing Price to Increase

4.2.2.7.2 Rotated Component Matrix

The Varimax's approach was used as rotation approach and factor loading value was set at 0.4 for analysis which means when the value is higher than 0.4, the variable was loaded into the specific component as shown in Table 4.21.

Table 4.21 Rotated Component Matrix of Factors Cause Malaysia Housing Price to Increase

Factors	Financing Cost	Macroeconomic	Return on Investment	Supply Chain	Infrastructure Demand	Housing Price Index	Plot Ratio
			Component				
Permit Fees	0.913						
Layout of the House	0.907						
Stamp Duty	0.870						
Leasehold / Freehold House	0.863						
Rising labour costs		0.911					
Geographical factors		0.896					
Economic uncertainty and financial risks		0.894					
Developers' profit margin			0.875				
Innovation and skills			0.729				
Number of new houses being built			0.723				
Climate changes			0.683				
Shortage of Material				0.828			
Quality of Material & Component Use				0.735			
Location – Urban/Rural				0.478			
Availability Facilities					0.859		
Currency Exchange Rate					0.735		
Households confidence on future price						0.671	
Strategic Factors						0.593	
Interest rates						0.566	
Planning restriction on the use of land							0.429
Size of the House							0.878

4.2.2.7.3   Component of Factors Cause Malaysia Housing Price to Increase

Table 4.22 shows 21 factors in this research categorised into seven components according to the results acquired from the factor analysis of rotated component matrix.

Table 4.22 Component of Factors Cause Malaysia Housing Price to Increase

Component	Name	Factors
1	Financing Cost	- Permit Fees - Layout of the House - Stamp Duty - Leasehold / Freehold House
2	Macroeconomic	- Rising labour costs - Geographical factors - Economic uncertainty and financial risks
3	Return on Investment	- Developers' profit margin - Innovation and skills - number of new houses being built - Climate changes
4	Supply Chain	- Shortage of Material - Quality of Material & Component Use - Location – Urban/Rural
5	Infrastructure Demand	- Availability Facilities - Currency Exchange Rate
6	Housing Price Index	- Households confidence on future price - Strategic Factors - Interest rates
7	Plot Ratio	- Planning restriction on the use of land - Size of the House

Financing Cost:

The first component was named 'Financing Cost' because of its contents and it comprises four factors causing the Malaysian housing price to increase. Specifically, it explained 17.861 per cents in the model and the factor loadings for the four factors range from 0.905 to 0.939. A second-order factor analysis combined these four factors into a single component of 'Financing Cost'. The KMO measure of sampling adequacy indicated a good relationship (MSA = 0.851, $x2$ (6) = 425.884, $p<0.001$). This confirms the relationship between the factors. The four factors collectively explained 85.439 per cent in this model. The validity ranges from 0.818 to 0.882, leasehold or freehold house will leave with the least validity. The collective Cronbach's alpha reliability for the four factors was 0.937.

Macroeconomic:

The second component was named 'Macroeconomic' because of its contents and it comprises three factors causing the Malaysian housing price to increase. Specifically, it explained 15.46 per cent in the model and the factor loadings for the three factors range from 0.927 to 0.959. A second-order factor analysis combined these three factors into a single component of 'Macroeconomic'. The KMO measure of sampling adequacy indicated a good relationship (MSA = 0.746, $x2$ (3) = 293.531, $p<0.001$). This confirms the relationship between the factors. The three factors collectively explained 88.422 per cent in this model. The validity ranges from 0.860 to 0.919, geographical factors will leave with the least validity. The collective Cronbach's alpha reliability for the three factors was 0.933.

Return on Investment:

The third component was named 'Return on Investment' because of its contents and it comprises four factors causing the Malaysian housing price to increase. Specifically, it explained 12.779 per cent in the model and the factor loadings for the four factors ranges from 0.716 to 0.842. A second-order factor analysis combined these four factors into a single component of 'Return on Investment'. The KMO measure of sampling adequacy indicated a good relationship (MSA = 0.663, x2 (6) = 162.643, p<0.001). This confirms the relationship between the factors. The four factors collectively explained 62.359 per cent in this model. The four factors validity ranges from 0.512 to 0.709, with the number of new houses being built will leave with the least validity. The collective Cronbach's alpha reliability for the four factors was 0.796.

Supply Chain:

The fourth component was named 'Supply Chain' because of its contents and it comprises three factors causing the Malaysian housing price to increase. Specifically, it explained 8.158 per cent in the model and the factor loadings for the three factors range from 0.553 to 0.843. A second-order factor analysis combined these three factors into a single component of 'Supply Chain'. The KMO measure of sampling adequacy indicated a good relationship (MSA = 0.541, x2 (3) = 36.533, p<0.001). This confirms the relationship between the factors. The three factors collectively explained 53.568 per cent in this model. The validity ranges from 0.306

to 0.711, location (urban or rural) will leave with the least validity. The collective Cronbach's alpha reliability for the three factors was 0.566.

Infrastructure Demand:

The fifth component was named 'Infrastructure Demand' because of its contents and it comprises two factors causing the Malaysian housing price to increase. Specifically, it explained 7.735 per cent in the model and the factor loadings for the two factors both are 0.901. A second-order factor analysis combined these two factors into a single component of 'Infrastructure Demand'. The KMO measure of sampling adequacy indicated a good relationship (MSA = 0.500, x2 (1) = 55.597, p<0.001). This confirms the relationship between the factors. The two factors collectively explained 81.222 per cent in this model. The two factors contain the same validity which is 0.812. The collective Cronbach's alpha reliability for the two factor was 0.761.

Housing Price Index:

The sixth component was named 'Housing Price Index' because of its contents and it comprises three factors causing the Malaysian housing price to increase. Specifically, it explained 7.310 per cent in the model and the factor loadings for the three factors range from 0.608 to 0.793. A second-order factor analysis combined these three factors into a single component of 'Housing Price Index'. The KMO measure of sampling adequacy indicated a good relationship (MSA = 0.582, x2 (3) = 26.337, p<0.001). This confirms the relationship between the factors. The three

factors collectively explained 51.857 per cent in this model. The validity ranges from 0.369 to 0.629, strategic factors will leave with the least validity. The collective Cronbach's alpha reliability for the three factors was 0.530.

Plot Ratio:

The seventh component was named 'Plot Ratio' because of its contents and it comprises two factors causing the Malaysian housing price to increase. Specifically, it explained 6.075 per cent in the model and the factor loadings for the two factors both are 0.796. A second-order factor analysis combined these two factors into a single component of 'Plot Ratio'. The KMO measure of sampling adequacy indicated a good relationship (MSA = 0.500, x^2 (1) = 8.368, p>0.004). This confirms the relationship between the factors. The two factors collectively explained 63.387 per cent in this model. The two factors contain the same validity which is 0.634. The collective Cronbach's alpha reliability for the two factors was 0.422.

4.2.3 Part Three: Construction Materials will have the Highest Risk of Unstable Supply During Construction

This section seeks to analyse the construction materials which will have the risk of unstable supply during construction. There are 14 construction materials involve in this research. However, before the main analysis, the reliability analysis and

validity test of the construction materials were carried out to determine the strength of the data. Then, the one sample t-test and KMO were also conducted.

4.2.3.1 Reliability Analysis of Construction Materials

Table 4.23 shows the Cronbach's alpha value in this survey was 0.730. Therefore, it proved that all the construction materials are consistent or repeatability of measure is in the good range for this research.

Table 4.23 Reliability of Construction Materials

Cronbach's Alpha	N of Items
0.730	14

Table 4.24 shows that Cronbach's alpha values for each of construction materials range from 0.692 to 0.745. Paint accounted as the lowest Cronbach's alpha value of 0.692 while tiles constituted the highest value of 0.743. Each of the construction materials in this study contained good Cronbach's alpha values, therefore it is proven that the construction materials have high consistency and are reliable.

Table 4.24 Item-Total Statistic of Construction Materials

Construction Materials	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Cement	53.6754	26.363	0.388	0.710
Sand	54.0877	24.895	0.386	0.711
Concrete	53.7105	26.792	0.441	0.708
Brick	53.7982	25.915	0.526	0.698
Tiles	53.7632	28.643	0.078	0.745
Window	53.4035	27.977	0.284	0.722
Door	53.3684	27.916	0.320	0.719
Paint	53.9035	24.371	0.525	0.692
Formwork	54.3070	23.560	0.469	0.698
Reinforcement Bar	54.2281	26.160	0.325	0.718
Ironmongeries	53.8333	26.901	0.227	0.731
Rainwater goods	53.7456	26.616	0.403	0.710
Waterproofing	53.5702	27.345	0.392	0.713
Aggregates	54.2632	27.612	0.187	0.733

4.2.3.2 Validity Test of Construction Materials

The outcomes of the validity test using communalities are shown in Table 4.25. The resulting value is ranged from 0.479 to 0.856 with ironmongeries presented the lowest value and formwork accounted the highest value.

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Table 4.25 Communalities of Construction Materials

Construction Materials	Initial	Extraction
Cement	1.000	0.693
Sand	1.000	0.669
Concrete	1.000	0.785
Brick	1.000	0.717
Tiles	1.000	0.736
Window	1.000	0.692
Door	1.000	0.541
Paint	1.000	0.779
Formwork	1.000	0.856
Reinforcement Bar	1.000	0.643
Ironmongeries	1.000	0.479
Rainwater goods	1.000	0.593
Waterproofing	1.000	0.608
Aggregates	1.000	0.772

4.2.3.3 Kaiser-Meyer-Olkin (KMO) of Construction Materials

The value of KMO and Bartlett's test displayed in Table 4.26 was 0.655 and 0.000 respectively which are greater than 0.6 and less than 0.05.

Table 4.26 Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Construction Materials

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.655
Bartlett's Test of Sphericity	Approx. Chi-Square	485.853
	df	91
	Sig.	0.000

4.2.3.4 One sample T-Test of Construction Materials

The results of the construction materials analysed by one sample t-test are indicated in Table 4.27. For each construction materials, the null hypothesis presented that the construction materials will not be available (H_0: $U=U_0$) while the alternative hypothesis was that the construction materials will be available (H_r: $U>U_0$). The test value used in this test is 1.5 which means the population mean U_0 is 1.5 and the determinant = 0.011. From the results, all the construction materials indicate the p-value of 0.000 which means those construction materials are significant (H_r: $U>U_0$). So that, the alternative hypothesis will be accepted and the null hypothesis is rejected.

Table 4.27 One Sample T-Test of Construction Materials

Construction Materials	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Cement	37.730	114	0.000	2.78696	2.6406	2.9333
Sand	24.041	114	0.000	2.37826	2.1823	2.5742
Concrete	46.521	114	0.000	2.76087	2.6433	2.8784
Brick	41.463	114	0.000	2.67391	2.5462	2.8017
Tiles	33.636	114	0.000	2.71739	2.5574	2.8774
Window	55.565	114	0.000	3.07391	2.9643	3.1835
Door	59.832	114	0.000	3.10870	3.0058	3.2116
Paint	29.238	114	0.000	2.56087	2.3874	2.7344
Formwork	19.982	114	0.000	2.15217	1.9388	2.3655
Reinforcement Bar	26.040	114	0.000	2.24783	2.0768	2.4188
Ironmongeries	29.381	114	0.000	2.63913	2.4612	2.8171
Rainwater goods	40.942	114	0.000	2.72609	2.5942	2.8580

Table 4.27 One Sample T-Test of Construction Materials (Cont'd)

Construction Materials	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Waterproofing	52.766	114	0.000	2.90000	2.7911	3.0089
Aggregates	26.830	113	0.000	2.21053	2.0473	2.3738

4.2.3.5 Descriptive Statistic of Construction Materials

Table 4.28 shows the frequency of the respondents on different perception on the construction materials. 13.90 per cent of the respondents gave the response as shortage, 39.70 per cent of the respondents measure all the construction materials as low shortage and 41.70 per cent of the respondents agreed on very low shortage. This means that 95.30 per cent of the respondents do not agree on shortages of construction materials in Malaysia.

Table 4.28 Descriptive Statistic of Construction Materials

Construction Materials	Extremely Shortage	High Shortage	Shortage	Low Shortage	Very Low Shortage
Cement	0	0	24	34	57
Sand	2	9	33	28	43
Concrete	0	2	6	67	40
Brick	0	2	13	63	37
Tiles	3	3	6	57	46
Window	0	0	6	37	72
Door	0	0	4	37	74
Paint	0	7	26	35	47
Formwork	5	14	31	31	34

Table 4.28 Descriptive Statistic of Construction Materials (Cont'd)

Construction Materials	Extremely Shortage	High Shortage	Shortage	Low Shortage	Very Low Shortage
Reinforcement Bar	0	16	19	58	22
Ironmongeries	0	8	22	31	54
Rainwater Goods	0	4	7	63	41
Waterproofing	0	1	3	60	51
Aggregates	0	6	47	35	26

4.2.3.6 Ranking of Construction Materials

The shortages of construction materials ranked by 115 respondents are described in Table 4.29. The mean of each construction material is shown and the construction materials were ranked based on their mean value where the lower the mean value, the higher the rank would be. According to the analysis, the mean ranging from 3.652 to 4.609 which the construction materials of formwork accounted the lowest mean value while door constituted the highest mean value. Besides, the total average of mean and standard deviation of the shortages of construction materials are 4.138 and 0.812 respectively.

Table 4.29 Ranking for Shortages of Construction Materials

Construction Materials	Mean	Standard Deviation	Ranks
Formwork	3.6522	1.15503	1
Aggregates	3.7105	0.87970	2
Reinforcement Bar	3.7478	0.92569	3
Sand	3.8783	1.06085	4
Paint	4.0609	0.93927	5
Ironmongeries	4.1391	0.96325	6
Brick	4.1739	0.69156	7
Tiles	4.2174	0.86636	8
Rainwater goods	4.2261	0.71403	9
Concrete	4.2609	0.63642	10
Cement	4.2870	0.79212	11
Waterproofing	4.4000	0.58938	12
Window	4.5739	0.59325	13
Door	4.6087	0.55718	14

4.3 Results of Home User Survey

A total of 860 questionnaires were distributed to the home users in Penang. Five hundred and twenty-nine completed questionnaires were returned. This is 61.51% (529 of 860) response rate. Table 4.30 shows the distribution of the home users' response rate of the questionnaire survey and Figure 4.5 shows the distribution of the home users' total response rate out of the total sent out survey. The response rate is considered adequate for this research to be reported. A response rate at about 60 per cent for most research ought to be the objective of the researcher and surely are the suspense of the editor and associate editors of the journal (Fincham, 2008). According to Fincham (2008), a response rate of 50 per cent to 60 per cent or greater is optimal because no response bias is thought to be minimal with that high percentage of a response rate.

Table 4.30 Distribution of the Home User Response Rate of the Questionnaire Survey

Item	Total Sent Out	Total Respond
Taman Seri Hijau	200	128
Relau Vista Apartment	180	123
Sri Kristal Apartment	180	133
Taman Kristal Apartment	100	56
Menara Kuda Lari	100	62
Sri Pelangi	100	27
Total Questionnaires	**860**	**529**

Figure 4.5 Distribution of the Home User Total Respond Rate of the Total Sent Out for the Survey

4.3.1 Part One: Respondents' Profiles

Sixteen questions were addressed to the respondents in order to elicit the information on their profiles. Specifically, this part seeks to identify the respondents' academic qualifications, type of houses and the respondents' family monthly income. In addition, it seeks to identify the respondents' position in their family,

respondents' current price of the house, distance from home to the workplace and public transportation. Besides, it also seeks to identify the respondents' size of house, number of members living in the house, number of rooms, kitchen and toilet or bathrooms in the house, either renting or owning the current house and the expenses for utility fees.

Figure 4.6 indicates that more than 57 per cent of the respondents were children and more than 40 per cent were parents. The total numbers of respondents were 529 people, the number of children and parents were 306 people and 223 people respectively.
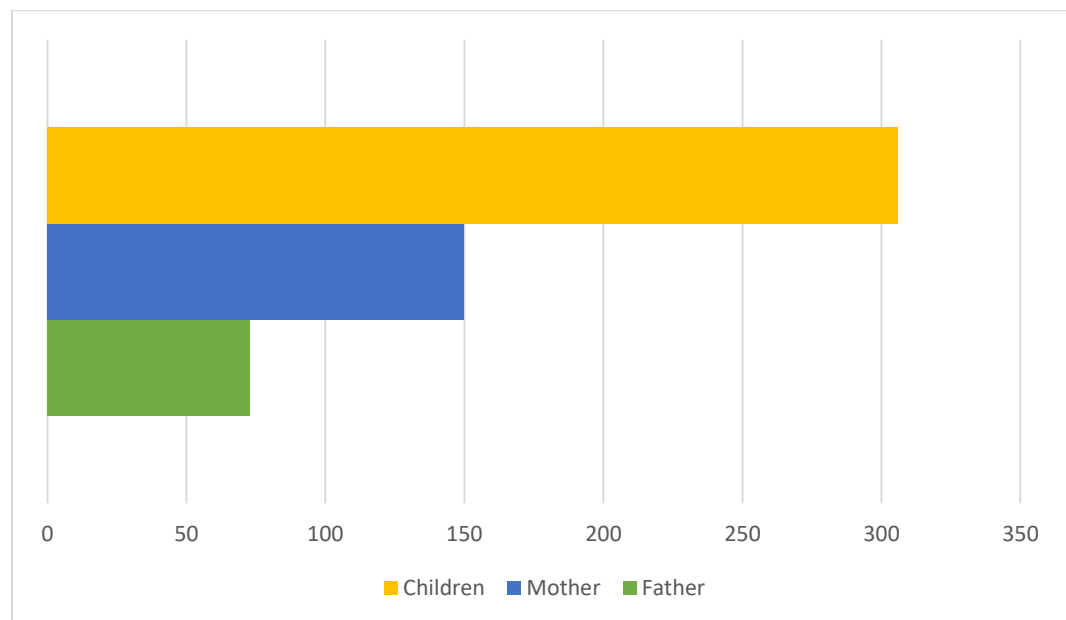
Figure 4.6 Distribution of Respondents' Position in the Family

Figure 4.7 shows the educational qualification of respondents in the form of a pie chart. Bachelor's degree academic level constituted the highest percentage at

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59 per cent. Nearly 23 per cent of the respondents hold a diploma while O-Level or Sijil Pendidikan Malaysia (SPM) shows percentage of 10 per cent. Besides, the the percentage of master's degree holders was six per cent while Penilaian Menengah Rendah (PMR) and A-Level or Sijil Tinggi Pendidikan Malaysia (STPM) were only one per cent.
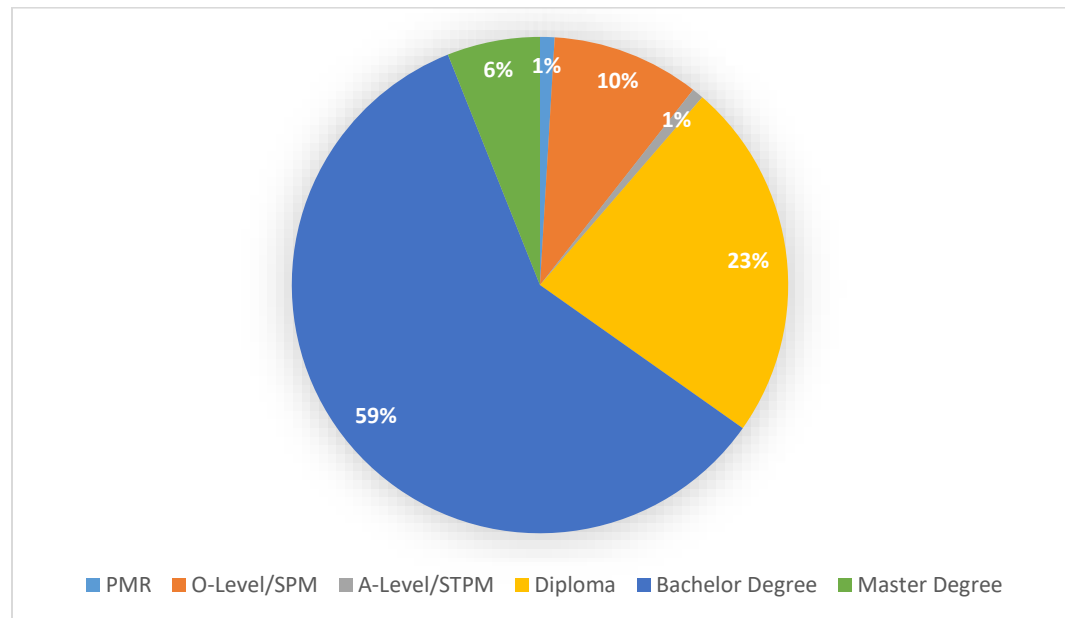
Figure 4.7 Distribution of Respondents' Education Qualification

Figure 4.8 displays the amount on types of houses that respondents currently live in. It was found that all of the respondents live in high-rise buildings with about 130 people live in flats and more than 400 people live in condominiums or apartments.
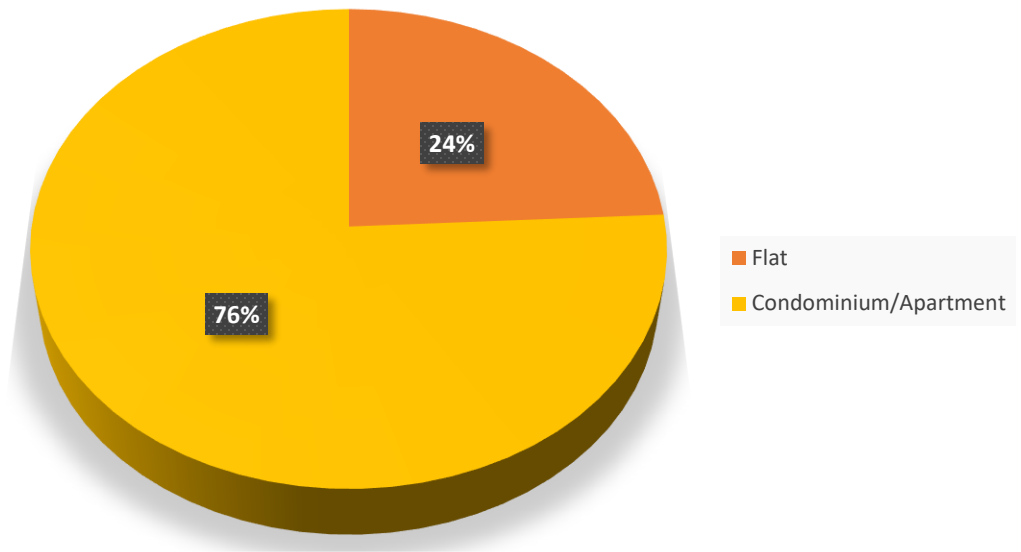
Figure 4.8 Distribution of Type of House the Respondents Currently Living

Figure 4.9 indicates the status of house ownership of the respondents. More than 80 per cent of the respondents have their own houses and nearly 16 per cent of the respondents rent the houses they currently live in.
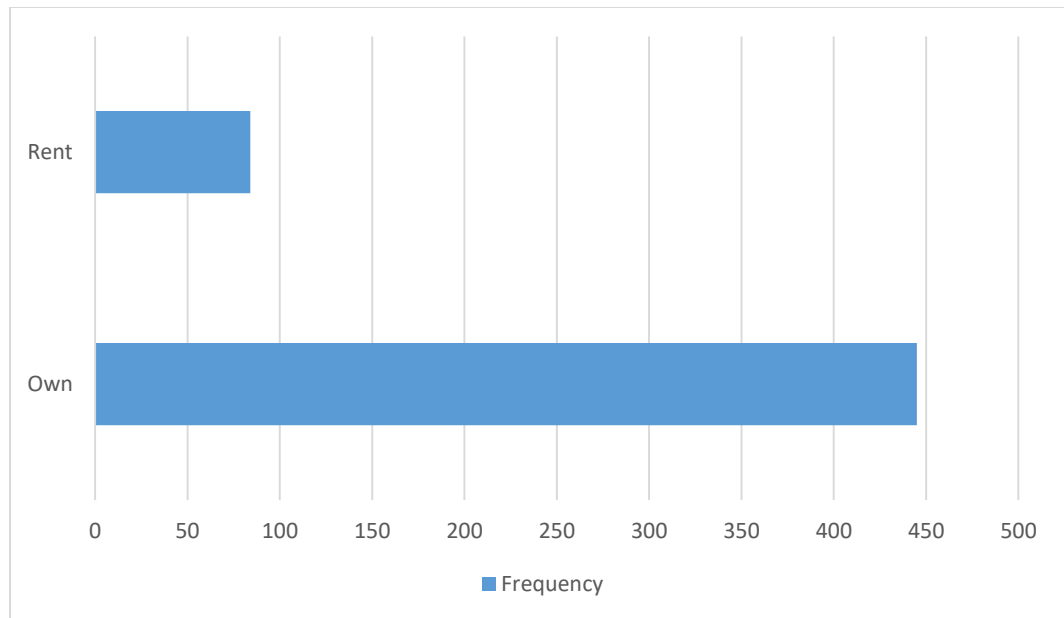
Figure 4.9 Distribution of Respondents' Status of House Ownership

The cross-tabulation between the types of houses that the respondents currently living in and the status of house ownership are expressed in Table 4.31. It shows that 401 of the 529 respondents who lived in condominium or apartment, with 337 respondents own the houses and 64 respondents are on rental terms. Moreover, 108 respondents own houses and 20 respondents rent flat houses.

Table 4.31 Distribution of Cross-Tabulation between Type of House Respondents Currently Living and Status of House Ownership of Respondents

Types of House	Status of House Ownership		Total
	Own	Rent	
Flat	108	20	128
Condominium/ Apartment	337	64	401
Total	**445**	**84**	**529**

The data of owning a transport is displayed in Figure 4.10. Owning a transport question was answered as 'yes' or 'no'. Based on the result, all of the respondents own a transport.
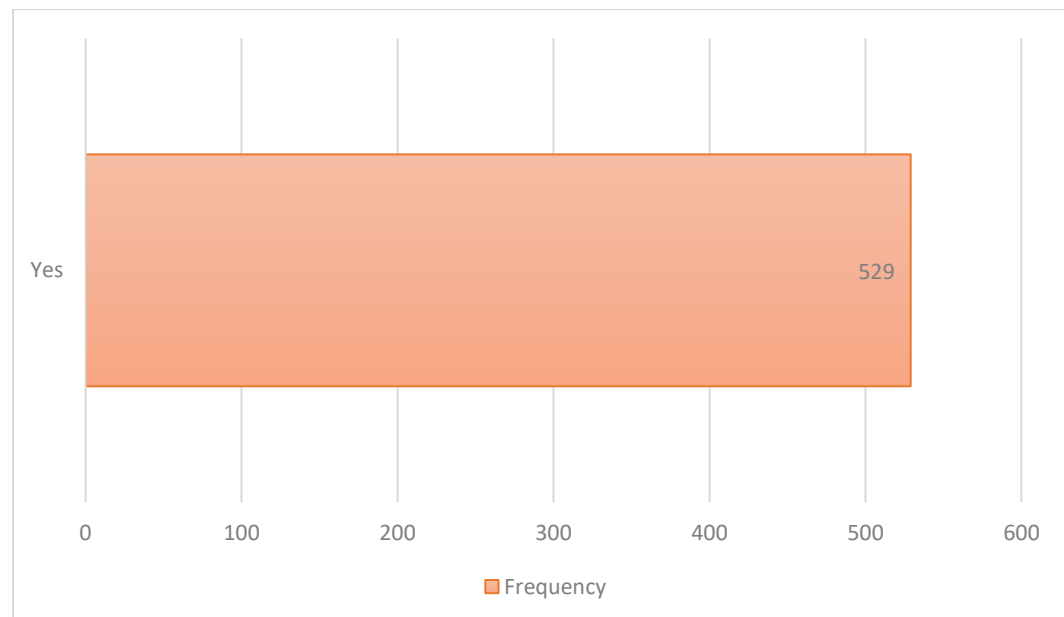
Figure 4.10 Distribution of Respondent' Own Transportation

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The column chart indicates the number of cars owned by the respondents' family (Figure 4.11). More than 95 per cent of the respondents' family own a minimum of one car. There are 213 respondents own two cars which accounted to about 40 per cent of the total. 169 respondents owned three cars while 135 respondents owned only one car in the family. Only 12 respondents do not own any car in the family. Figure 4.10 shows that all the respondents have their own transportation, but Figure 4.11 shows 95 per cent of the respondents' family owned a car, while the balance of five per cent of the respondents own other types of transport such as motorcycle and bicycle.
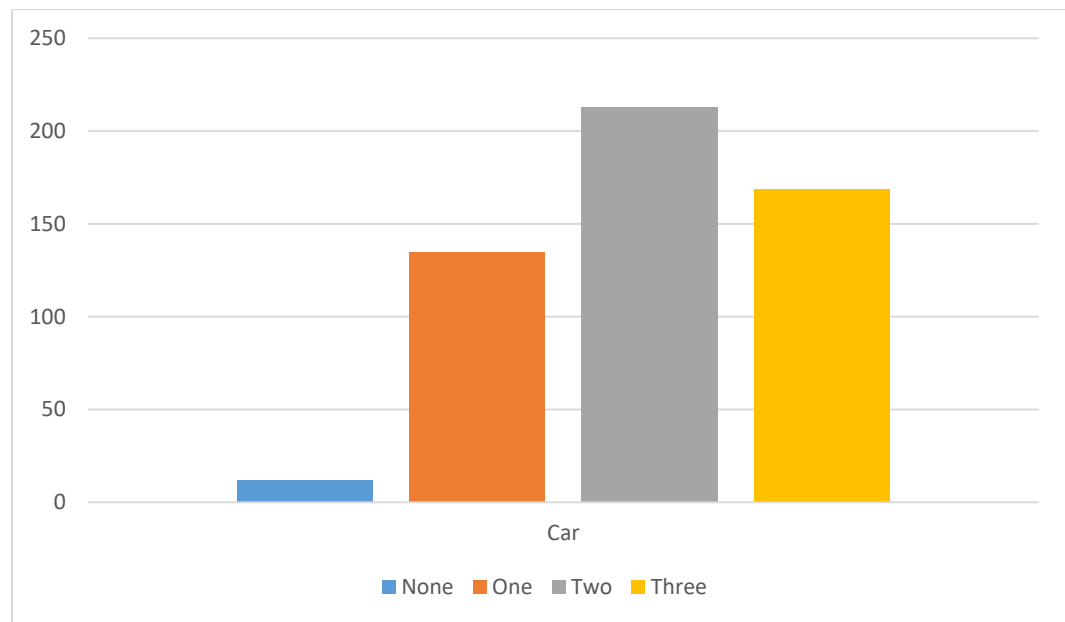
Figure 4.11 Distribution of Respondent' Number of Cars in the Family

Cross-tabulation between the number of cars owned in the respondents' family and the number of car parking space available for respondents are expressed in Table 4.32. It shows that all of the respondents only own one car parking space but there are more than 70 per cent of the respondents owning more than two cars

in the family. It shows that the numbers of cars are more than the allotted number

of car parking spaces.

Table 4.32 Distribution of Cross-Tabulation between Number of Cars Owned in Respondents' Family and Number of Car Parking Space Available For Respondents

Number of Cars in the Family	Number of Car Parking Space	Total
	One	
None	12	12
One	135	135
Two	213	213
Three	169	169
Total	**529**	**529**

Cross-tabulation between transportation owned in respondents' family and

distance from home to workplace is expressed in Table 4.33. It shows that all of the

respondents only own transportation in the family but there is almost 50 per cent of

the respondents travels more than 20 kilometres to the workplace.

Table 4.33 Distribution of Cross-Tabulation between Transportation Owned in Respondents' Family and Distance from Home to the Place of Work

Family Have Own Transport	Distance from home to place of work					Total
	Less than 5km	5 - 10km	10 - 15km	15 - 20km	More than 20km	
Yes	181	65	35	49	199	529
Total	**181**	**65**	**35**	**49**	**199**	**529**

Figure 4.12 indicates that 529 of the respondents' distance from home to

the public bus station (rapid bus) are less than five kilometres.

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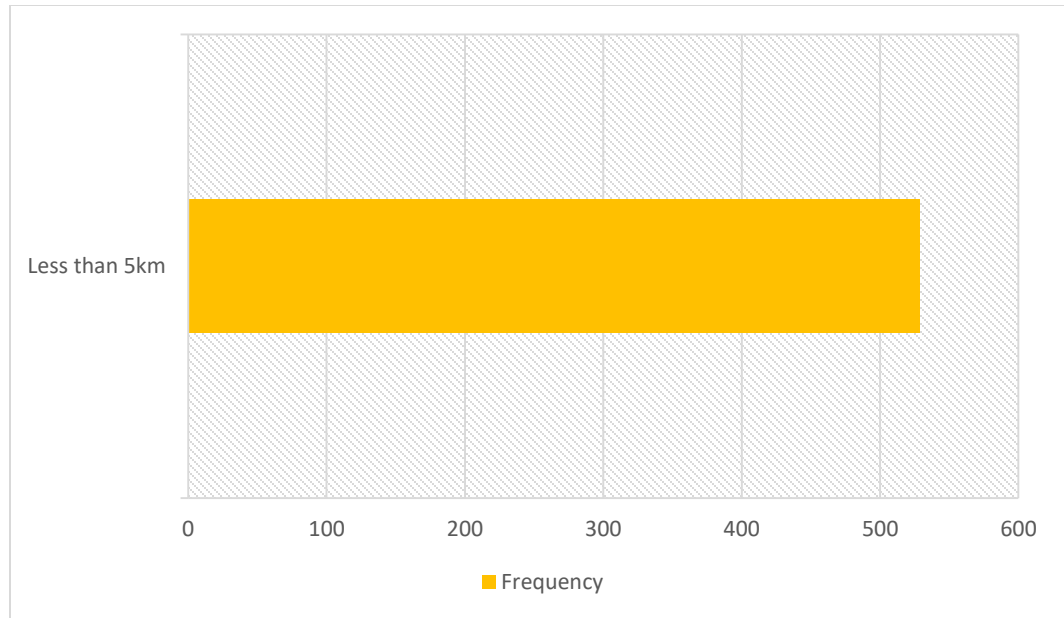
Figure 4.12 Distribution of Respondents' Distance between Home to Public Bus Station (Rapid Bus)

Figure 4.13 shows the group of respondents' travel distance between their homes to train stations. 145 respondents travel from home to train station at a distance between five kilometres and 10 kilometres which constituted the largest group with the percentage of 27.4 per cent. 25.1 per cent of respondents travel a distance between 10 kilometres and 15 kilometres, while 24.2 per cent of respondents travel at more than 20 kilometres. Moreover, the distance of 15 to 20 kilometres has the percentage at 23.3 per cent.

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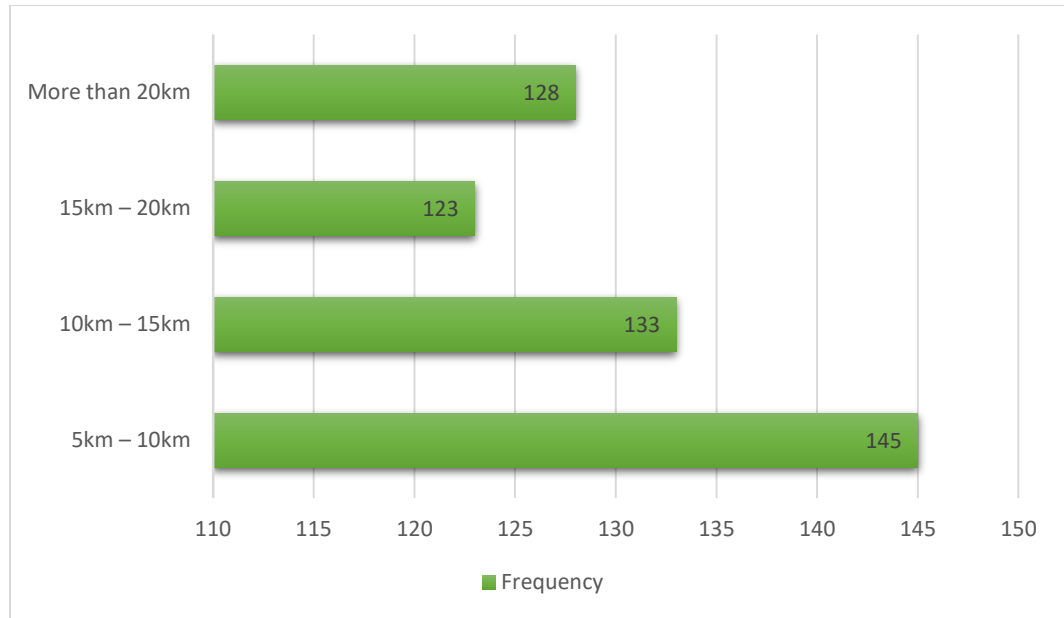
Figure 4.13 Distribution of Respondents' Distance between Home to Train Station

Figure 4.14 shows the group of respondents' travel distance between homes to the bus terminal. 278 respondents travel from home to bus terminal at a distance between 10 kilometres and 15 kilometres which constituted the largest group at 52.6 per cent, while 47.7 per cent of respondents travel a distance between five kilometres and 10 kilometres.
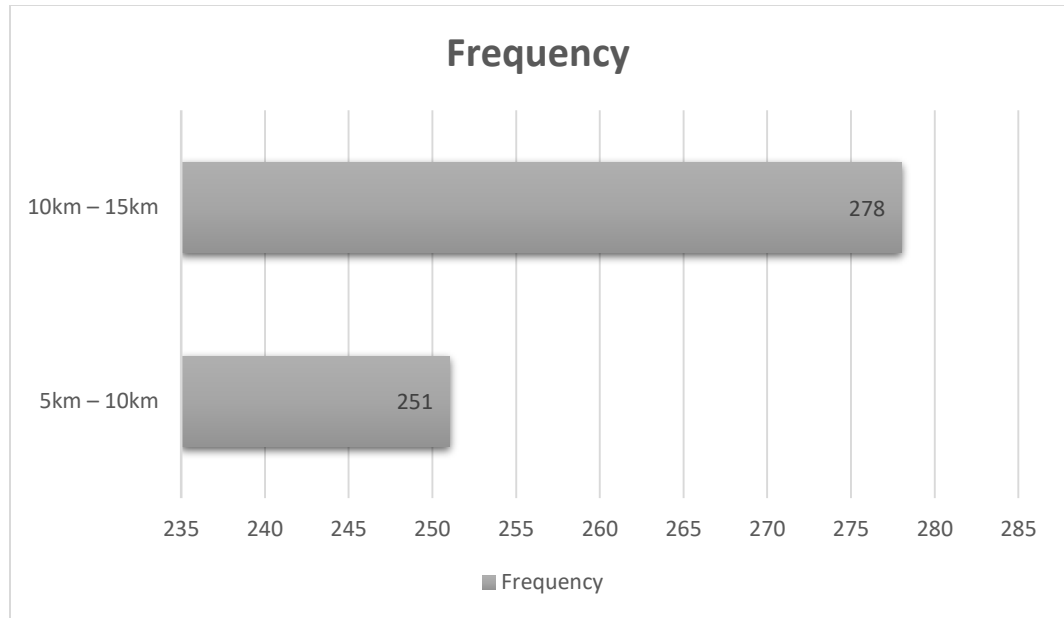
Figure 4.14 Distribution of Respondents' Distance between Home to Bus Terminal

Figure 4.15 represents the range of current price (purchase) of the house of the 529 respondents. The group price ranging from RM300,000 to RM399,000 accounted for the largest group at about 95 per cent. The price group ranging from RM400,000 to RM499,000 accounted for 5.1 per cent.
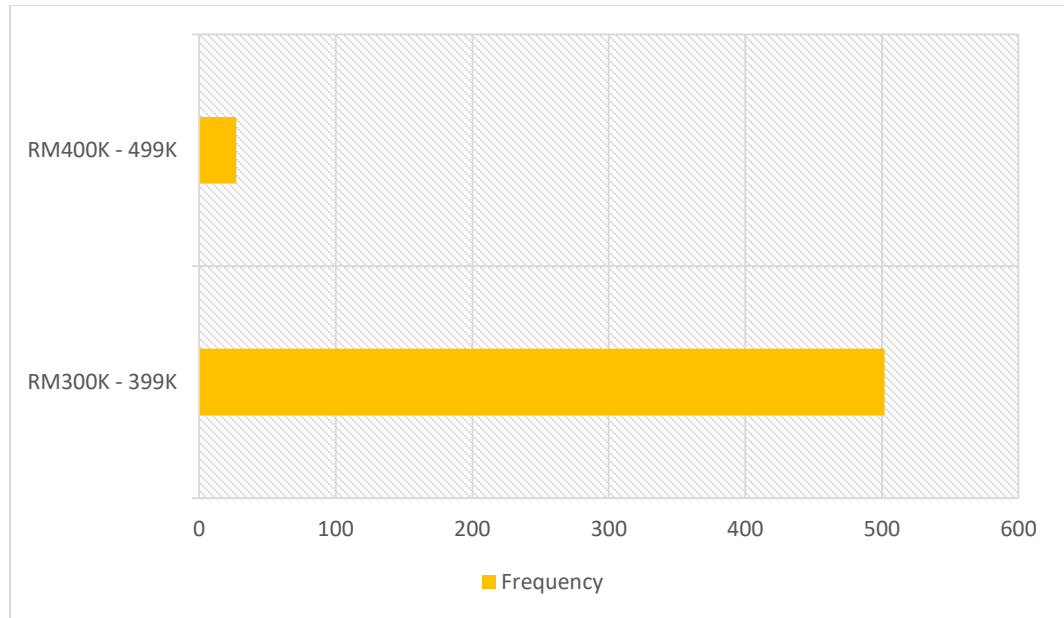
Figure 4.15 Distribution of Respondents' Current Price (Purchase) of the House

Figure 4.16 indicates that 529 of the respondents live in houses with the size of 500 to 999 square feet.
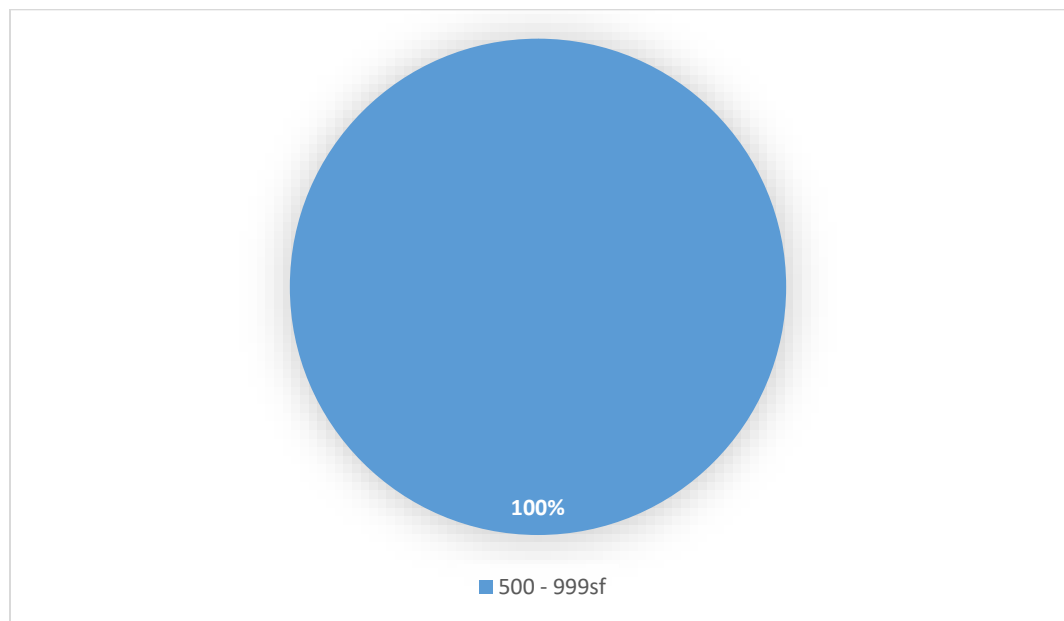
Figure 4.16 Distribution of Respondents' Size of the House

The cross-tabulation between respondents' size of houses and number of members living in the house are shown in Table 4.34. It shows that all of the respondents live in 500 to 999 square feet houses and there are almost 63 per cent of the respondents having four members living in their house. About 17 per cent of respondents have more than five members living in their house. The percentage of three members and two members are 12.3 per cent and 8.7 per cent respectively.

Table 4.34 Distribution of Cross-Tabulation between Respondents' Size of the House and Numbers of Member Living in the House

Size of the House (Square Feet)	Numbers of Member Living in The House				Total
	2	3	4	More than 5	
500 - 999	46	65	330	88	529
Total	**46**	**65**	**330**	**88**	**529**

The monthly household income of respondents is displayed and presented in Figure 4.17. Approximately 34 per cent of the respondents' monthly household income ranging from RM2,000 to RM3,999 and followed by 26.3 per cent of respondents with the monthly household income between RM4,000 to RM5,999. Besides, monthly household income between RM6,000 to RM7,999 accounted for 21.6 per cent while 8.9 per cent of the respondents have a monthly household income more than RM10,000. In addition, 6.8 per cent of respondents earned their monthly household income between RM8,000 to RM9,999 and 2.5 per cent of respondents earn less than RM1,999.
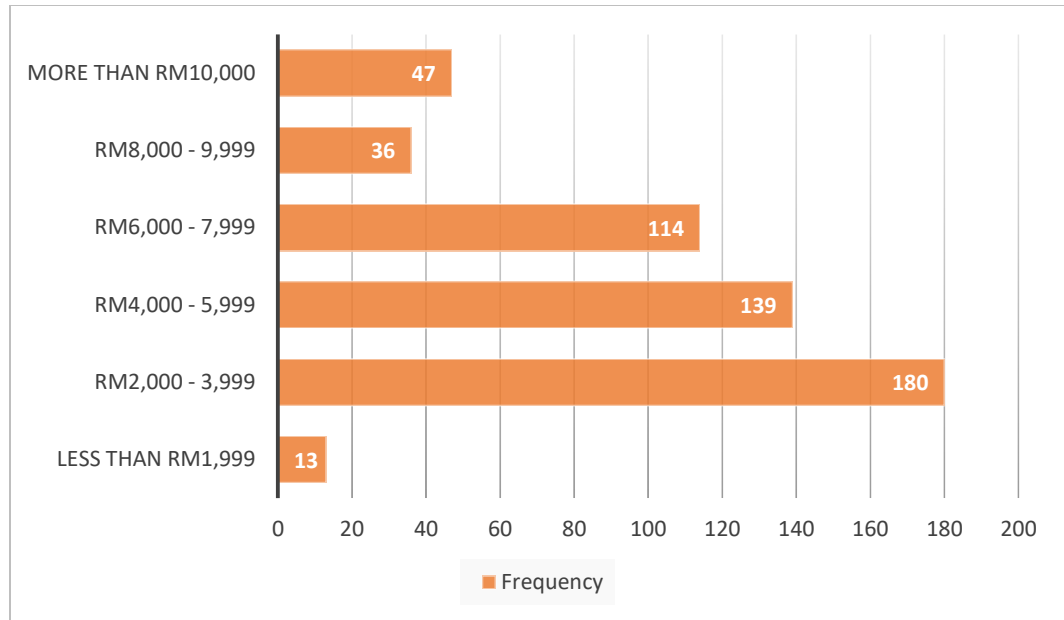
Figure 4.17 Distribution of Respondents' Household Monthly Income

The cross-tabulation in Table 4.35 shows the monthly household income and monthly household expenses for utility fees (percentage). The most at 47.1 per cent respondents spending 21 per cent to 25 per cent of their monthly household expenses for utility fees are the respondents from the group with a monthly household income between RM2,000 to RM3,999. While 33.8 per cent of respondents group from monthly household income range between RM4,000 to RM5,999 use more than 30 per cent of their monthly household expenses for utility fess. Predominantly 186 respondents, those that use six per cent to 10 per cent of their monthly household expenses for utility fees.

Table 4.35 Cross- Tabulation between Monthly Household Income and Monthly Household Expenses for Utility Fees (Percentage)

Monthly Household Income	Monthly Household Expenses for Utility Fees (Percentage)							Total
	Less Than 5%	6 - 10%	11 - 15%	16 - 20%	21 - 25%	26 - 30%	More Than 30%	
Less than RM1,999	9.5%	3.2%	3.2%	0.0%	0.0%	5.0%	1.3%	2.5%
RM2,000 - 3,999	33.3%	34.4%	40.4%	31.6%	47.1%	25.0%	28.6%	34.0%
RM4,000 - 5,999	9.5%	25.3%	24.5%	28.1%	23.5%	25.0%	33.8%	26.3%
RM6,000 - 7,999	23.8%	19.4%	14.9%	27.2%	17.6%	17.6%	22.1%	21.6%
RM8,000 - 9,999	9.5%	6.5%	4.3%	9.6%	5.9%	5.9%	6.5%	6.8%
More than RM10,000	14.3%	11.3%	12.8%	3.5%	5.9%	0.0%	7.8%	8.9%
Total	100%	100%	100%	100%	100%	100%	100%	100%

4.3.1.1 Summary of the Respondents' Profiles

Table 4.36 shows the home users' profile, 57 per cent are children position in their respective family. The analysis shows that majority of the respondents possess bachelor's degree. More than 75 per cent of the respondents live in a condominium. The analysis revealed that 85 per cent own the house. Majority of the current price of the house is in the range between RM300,000 to RM399,999. The monthly household income is in the range from RM2,000 to RM3,999. Therefore, on the basis of the respondents' profiles, it is considered that their opinions on the demand for affordable housing in Malaysia are sufficient to report the findings of this research.

Table 4.36 Distribution of the Home Users Respondents Profile: Summary

Questions	Categories	Frequencies	Percentage
Positions	Children	306	57
Highest Academic Qualifications	Bachelor Degree	313	59
Type of House	Condominium or Apartment	401	76
Ownership	Own	445	84
Distance from Home to Place of Work	More than 20km	199	38
Distance from Home to Public Bus Station (Rapid Bus)	Less than 5km	529	100
Distance from Home to Train Station	Less than 5km	145	27
Distance from Home to Bus Terminal	10km – 15km	278	53
Current Price (Purchase) of the House	RM300k – RM399k	502	95
Size of the House	500 – 999sf	529	100
Number of Member in the House	4 members	330	62
Monthly Household Income	RM2,000 – RM3,999	180	34
Monthly Household Expenses for Utilities Fees	6 percent to 10 percent	445	84

4.3.2   Part Two: Factors Determine the Demand for Affordable Housing

This section seeks to analyse the factors that will determine the demand for affordable housing. There are 21 factors determining the demand for affordable housing involved in this research. However, before the main analysis, the reliability analysis and validity test of the construction materials were carried out to determine the strength of the data. Then, the KMO, one sample t-test and factor analysis were also conducted.

4.3.2.1 Reliability Analysis of Factors Determine the Demand for Affordable Housing

From Table 4.37, the result shows the Cronbach's alpha value in this survey is 0.865, so it proves that all the factors are consistent or the repeatability of measure is in a very good range for this research.

Table 4.37 Reliability of Factors Determine the Demand for Affordable Housing

Cronbach's Alpha	N of Items
0.865	21

Table 4.38 shows that the Cronbach's alpha values for each of the factors determining the demand for affordable housing in Malaysia. From the results, the numbers range from 0.848 to 0.870. Operation and maintenance costs; and adaptability accounted the lowest Cronbach's alpha value at 0.848 while family size and availability of mortgages constituted the highest value at 0.870. Each of the factors determining the demand for affordable housing in Malaysia in this study contained a very good Cronbach's alpha value, therefore, it is satisfactory and proven that all the factors have high consistency and are reliable.

Table 4.38 Item-Total Statistic of Factors Determine the Demand for Affordable Housing

Factors	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Household Income	42.896	88.207	0.284	0.866
Interest Rate on Loan	42.917	88.834	0.279	0.866
Family Size	42.682	90.388	0.170	0.870
Quality of House	43.078	89.265	0.269	0.866
Accessibility to Working Place	43.134	91.526	0.169	0.868
Availability of Mortgages	42.709	91.957	0.117	0.870
Access to Children School & Child Day Care Centre	42.902	91.744	0.151	0.869
Market/ Shopping Mall	42.303	85.450	0.618	0.855
Availability of Credit/Loan Facility	42.526	83.458	0.544	0.856
House Price	43.291	88.836	0.464	0.860
House Built-up Area	42.749	85.196	0.537	0.857
Available of Public Transport	42.463	81.147	0.661	0.851
Available of Own Transports	42.830	81.558	0.733	0.849
Neighbourhood	42.788	82.485	0.634	0.852
Type of House	42.546	86.320	0.442	0.860
Operation & Maintenance Costs	42.650	80.050	0.716	0.848
Adaptability	42.601	81.846	0.769	0.848
Leasehold / Freehold House	43.027	85.605	0.500	0.858
Crime Rate	43.541	89.991	0.263	0.866
Down Payment	43.144	86.351	0.455	0.859
Ability to Accommodate those with Mobility Restriction	42.885	82.871	0.692	0.851

4.3.2.2 Validity Test of Factors Determine the Demand for Affordable Housing

The outcomes of validity test by using communalities are shown in Table 4.39. The

resulting value is 0.414 (family size) to 0.891 (the type of house).

Table 4.39 Communalities of Factors Determine the Demand for Affordable Housing

Factors	Initial	Extraction
Household Income	1.000	0.830
Interest Rate on Loan	1.000	0.811
Family Size	1.000	0.414
Quality of House	1.000	0.768
Accessibility to Working Place	1.000	0.472
Availability of Mortgages	1.000	0.765
Access to Children School & Child Day Care Centre	1.000	0.768
Market/ Shopping Mall	1.000	0.818
Availability of Credit/Loan Facility	1.000	0.788
House Price	1.000	0.869
House Built-up Area	1.000	0.892
Available of Public Transport	1.000	0.892
Available of Own Transports	1.000	0.792
Neighbourhood	1.000	0.818
Type of House	1.000	0.919
Operation & Maintenance Costs	1.000	0.687
Adaptability	1.000	0.911
Leasehold / Freehold House	1.000	0.720
Crime Rate	1.000	0.881
Down Payment	1.000	0.653
Ability to Accommodate those with Mobility Restriction	1.000	0.774

4.3.2.3 Kaiser-Meyer-Olkin (KMO) of Factors Determine the Demand for Affordable Housing

The value of KMO and Bartlett's test displayed in Table 4.40 are 0.518 and 0.000 respectively which are greater than 0.5 and less than 0.05.

Table 4.40 Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Factors Determine the Demand for Affordable Housing

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.518
Bartlett's Test of Sphericity	Approx. Chi-Square	10953.982
	df	210
	Sig.	0.000

4.3.2.4 One sample T-Test of Factors Determine the Demand for Affordable Housing

The results of the factors analysed by one sample t-test are indicated in Table 4.41. For each factor, the null hypothesis presented that the factors will not determine the demand for affordable housing in Malaysia (H_0: $U=U_0$) while the alternative hypothesis was that the factors will determine the demand for affordable housing in Malaysia (H_r: $U>U_0$). The test value used in this test is 1.5 which means the population mean, U_0 is 1.5 and the determinant = 7.152E-010. From the results, all factors indicate the p-value of 0.000 which means those factors are significant (H_r: $U>U_0$). So that, the alternative hypothesis will be accepted and the null hypothesis

is rejected. Thus, those factors are able to stand as the factors determining the

demand for affordable housing in Malaysia.

Table 4.41 One Sample T-Test of Factors Determine the Demand for Affordable Housing

| Factors | Test Value = 1.5 | | | | | |
| | t | df | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
					Lower	Upper
Household Income	13.475	528	0.000	0.58696	0.5014	0.6725
Interest Rate on Loan	14.095	528	0.000	0.56616	0.4873	0.6451
Family Size	18.640	528	0.000	0.80057	0.7162	0.8849
Quality of House	10.541	528	0.000	0.40548	0.3299	0.4810
Accessibility to Working Place	10.574	528	0.000	0.34877	0.2840	0.4136
Availability of Mortgages	21.176	528	0.000	0.77410	0.7023	0.8459
Access to Children School & Child Day Care Centre	17.406	528	0.000	0.58129	0.5157	0.6469
Market/ Shopping Mall	36.325	528	0.000	1.18053	1.1167	1.2444
Availability of Credit/Loan Facility	21.750	528	0.000	0.95747	0.8710	1.0439
House Price	7.229	528	0.000	0.19187	0.1397	0.2440
House Built-up Area	19.481	528	0.000	0.73440	0.6603	0.8085
Available of Public Transport	22.655	528	0.000	1.01985	0.9314	1.1083
Available of Own Transports	16.370	528	0.000	0.65312	0.5747	0.7315
Neighbourhood	16.537	528	0.000	0.69471	0.6122	0.7772
Type of House	23.869	528	0.000	0.93667	0.8596	1.0138
Operation & Maintenance Costs	18.314	528	0.000	0.83270	0.7434	0.9220
Adaptability	23.574	528	0.000	0.88185	0.8084	0.9553

Table 4.41 One Sample T-Test of Factors Determine the Demand for Affordable Housing (Cont'd)

Factors	Test Value = 1.5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Leasehold / Freehold House	11.887	528	0.000	0.45652	0.3811	0.5320
Crime Rate	-1.681	528	0.093	-0.05766	-0.1250	0.0097
Down Payment	8.885	528	0.000	0.33932	0.2643	0.4143
Ability to Accommodate those with Mobility Restriction	15.872	528	0.000	0.59830	0.5242	0.6724

4.3.2.5 Descriptive Statistic of Factors Determine the Demand for Affordable Housing

The frequencies of the respondents on the different perception of the factors determining the demand for affordable housing in Malaysia is presented in Table 4.42. 31.34 per cent of the respondents indicated their responses as extremely important, 29.20 per cent of the respondents measured all the factors as very important and 33.47 per cent of the respondents agreed on important. This means that 94.02 per cent of the respondents agreed on the factors determining the demand for affordable housing in Malaysia.

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Table 4.42 Descriptive Statistic of Factors Determine the Demand for Affordable Housing

Factors	Extremely Important	Very Important	Important	Low Important	Very Low Important
Household Income	187	166	119	57	0
Interest Rate on Loan	175	178	142	34	0
Family Size	155	95	256	11	12
Quality of House	211	180	115	23	0
Accessibility to Working Place	198	213	118	0	0
Availability of Mortgages	104	206	189	30	0
Access to Children School & Child Day Care Centre	136	214	179	0	0
Market/ Shopping Mall	72	43	396	18	0
Availability of Credit/Loan Facility	121	129	195	84	0
House Price	205	282	42	0	0
House Built-up Area	133	157	221	18	0
Available of Public Transport	139	54	258	78	0
Available of Own Transports	188	72	269	0	0
Neighbourhood	139	214	110	66	0
Type of House	72	232	147	78	0
Operation & Maintenance Costs	152	127	172	78	0
Adaptability	103	151	245	30	0
Leasehold / Freehold House	218	116	195	0	0
Crime Rate	394	36	99	0	0
Down Payment	205	252	24	48	0

Table 4.42 Descriptive Statistic of Factors Determine the Demand for Affordable Housing (Cont'd)

Factors	Extremely Important	Very Important	Important	Low Important	Very Low Important
Ability to Accommodate those with Mobility Restriction	175	127	227	0	0

4.3.2.6 Ranking of Factors Determine the Demand for Affordable Housing

The factors that determined the demand for affordable housing in Malaysia ranked by 529 respondents are described in Table 4.43. According to the table, the mean ranging from 1.4423 to 2.6805 with the factor of crime rate had the lowest mean value while market or shopping mall accounted the highest mean value. Moreover, the total average mean and standard deviation ranging from 2.142 and 0.883.

Table 4.43 Ranking for Factors Determine the Demand for Affordable Housing

Factors	Mean	Std. Deviation	Ranks
Crime Rate	1.442	0.789	1
House Price	1.692	0.611	2
Down Payment	1.839	0.878	3
Accessibility to Working Place	1.849	0.759	4
Quality of House	1.906	0.885	5
Leasehold / Freehold House	1.957	0.883	6
Interest Rate on Loan	2.066	0.924	7
Access to Children School & Child Day Care Centre	2.081	0.768	8
Household Income	2.087	1.002	9
Ability to Accommodate those with Mobility Restriction	2.098	0.867	10

Table 4.43 Ranking for Factors Determine the Demand for Affordable Housing (Cont'd)

Factors	Mean	Std. Deviation	Ranks
Available of Own Transports	2.153	0.918	11
Neighbourhood	2.195	0.966	12
House Built-up Area	2.234	0.867	13
Availability of Mortgages	2.274	0.841	14
Family Size	2.301	0.988	15
Operation & Maintenance Costs	2.333	1.046	16
Adaptability	2.382	0.860	17
Type of House	2.437	0.903	18
Availability of Credit/Loan Facility	2.458	1.013	19
Available of Public Transport	2.520	1.035	20
Market/ Shopping Mall	2.681	0.747	21

4.3.2.7 Factor Analysis of Factors Determine the Demand for Affordable Housing

Factor analysis is used to determine the potential factors of a given list of measurable variables (Chai, 2017). In this research, the measurable variables are the factors that determine the demand for affordable housing in Malaysia used in the questionnaire survey.

4.3.2.7.1 Total Variance Explained

Table 4.44 shows that there are six components extracted from the analysis and the eigenvalues of these six components is greater than 1 which is accepted in the analysis. The total percentage of variance explained by Component 1 to

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Component 6 was 33.413 per cent, 15.765 per cent, 8.846 per cent, 7.400 per cent,

7.024 per cent and 4.901 per cent respectively. Besides, the cumulative of variance

of these six components are 77.349 per cent which is considered acceptable.

Table 4.44 Total Variance Explained of Factors Determine the Demand for Affordable Housing

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.017	33.413	33.413	7.017	33.413	33.413	4.422	21.058	21.058
2	3.311	15.765	49.179	3.311	15.765	49.179	3.292	15.678	36.736
3	1.858	8.846	58.025	1.858	8.846	58.025	2.681	12.766	49.502
4	1.554	7.400	65.425	1.554	7.400	65.425	2.199	10.472	59.975
5	1.475	7.024	72.448	1.475	7.024	72.448	2.092	9.960	69.934
6	1.029	4.901	77.349	1.029	4.901	77.349	1.557	7.415	77.349
7	0.778	3.704	81.053						
8	0.721	3.434	84.487						
9	0.631	3.007	87.494						
10	0.557	2.654	90.148						
11	0.425	2.022	92.170						
12	0.389	1.853	94.024						
13	0.330	1.574	95.598						
14	0.301	1.433	97.030						
15	0.250	1.192	98.223						
16	0.128	0.611	98.834						
17	0.084	0.402	99.236						
18	0.072	0.345	99.580						
19	0.047	0.224	99.804						
20	0.034	0.163	99.967						
21	0.007	0.033	100.000						
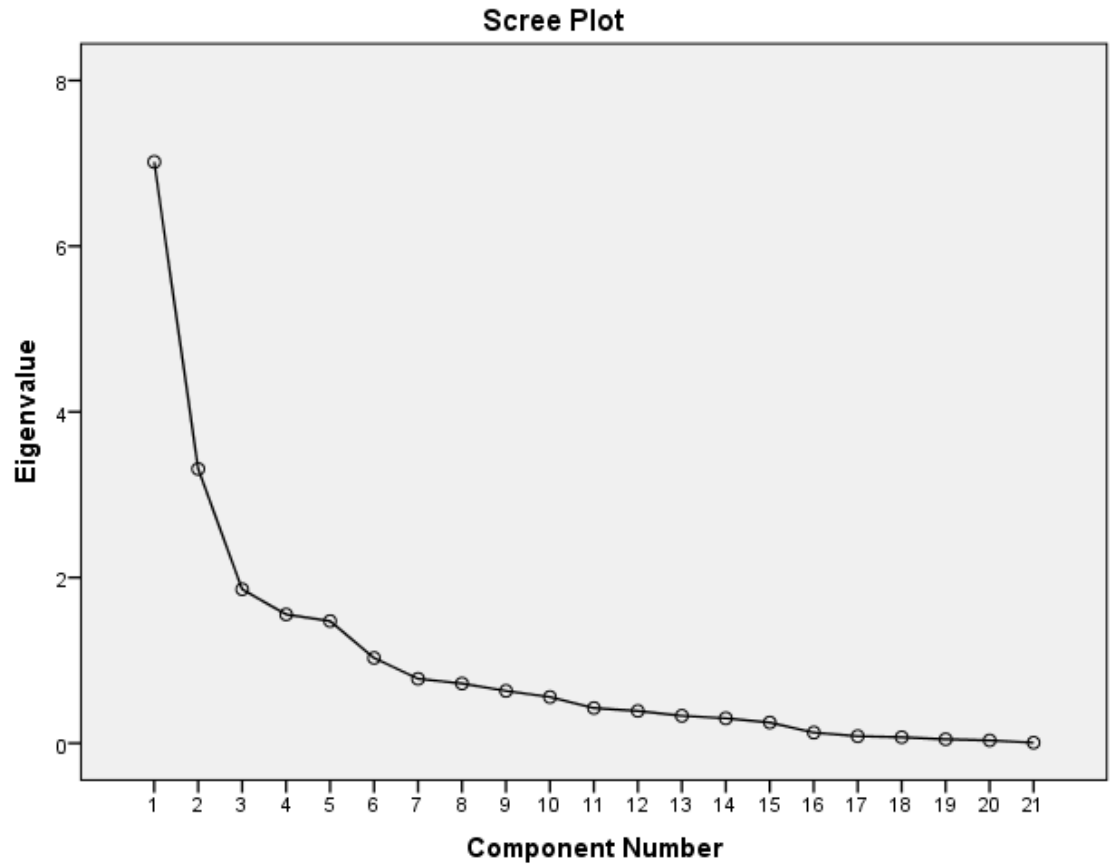
Figure 4.18 Screen Plot of Factors Determine the Demand for Affordable Housing

4.3.2.7.2 Rotated Component Matrix

The Varimax's approach was used as a rotation approach and factor loading value was set at 0.4 for analysis which means when the value is higher than 0.4, the variable was loaded into the specific component as shown in Table 4.45.

Table 4.45 Rotated Component Matrix of Factors Determine the Demand for Affordable Housing

Factors	Component					
	Transportation Cost	Repayment	Limitation on Consumable	Satisfaction	Neighborhood	Debt Impact
Available of Public Transport	0.842					
Neighbourhood	0.827					
Down Payment	0.798					
Available of Own Transports	0.665					
Availability of Credit/Loan Facility	0.647					
Ability to Accommodate those with Mobility Restriction	0.636					
Operation & Maintenance Costs	0.618					
Household Income		0.910				
Interest Rate on Loan		0.900				
Quality of House		0.875				
Accessibility to Working Place		0.684				
Family Size		0.639				
Market/ Shopping Mall			0.824			
Type of House			0.803			
House Built-up Area			0.775			
House Price				0.892		
Adaptability				0.659		
Crime Rate					0.927	
Leasehold / Freehold House					0.578	
Availability of Mortgages						0.874
Access to Children School & Child Day Care Centre						0.870

4.3.2.7.3 **Component of Factors Determine the Demand for Affordable Housing**

Table 4.46 shows 21 factors in this research are categorised into six components according to the results acquired from the factor analysis of the rotated component matrix.

Table 4.46 Component of Factors Determine the Demand for Affordable Housing

Component	Name	Factors
1	Transportation Cost	- Available of Public Transport - Neighbourhood - Down Payment - Available of Own Transports - Availability of Credit/Loan Facility - Ability to Accommodate those with Mobility Restriction - Operation & Maintenance Costs
2	Repayment	- Household Income - Interest Rate on Loan - Quality of House - Accessibility to Working Place - Family Size
3	Limitation on Consumable	- Market/ Shopping Mall - Type of House - House Built-up Area
4	Satisfaction	- House Price - Adaptability
5	Neighbourhood	- Crime Rate - Leasehold / Freehold House
6	Debt Impact	- Availability of Mortgages - Access to Children School & Child Day Care Centre

Transportation Cost:

The first component named 'Transportation Cost' because of its contents and it comprises seven factors determining the demand for affordable housing in Malaysia. Specifically, it explained 21.058 per cents in the model and the factor loadings for the seven factors range from 0.666 to 0.866. A second-order factor analysis combined these seven factors into a single component of 'Transportation Cost'. The KMO measures of sampling adequacy indicated a good relationship (MSA = 0.709, $x2$ (21) = 3036.128, p<0.001). This confirms the relationship between the factors. The seven factors collectively explained 64.527 per cent in this model. The validity ranges from 0.443 to 0.750, with down payment will leave with the least validity. The collective Cronbach's alpha reliability for the four factors was 0.906.

Repayment:

The second component named 'Repayment' because of its contents and it comprises five factors determining the demand for affordable housing in Malaysia. Specifically, it explained 15.678 per cent in the model and the factor loadings for the five factors ranging from 0.640 to 0.911. A second-order factor analysis combined these five factors into a single component of 'Repayment'. The KMO measures sampling adequacy indicates a good relationship (MSA = 0.689, $x2$ (10) = 1805.548, p<0.001). This confirms the relationship between the factors. The five factors collectively explained 65.676 per cent in this model. The validity ranges

from 0.410 to 0.829, with family size will leave with the least validity. The collective Cronbach's alpha reliability for the three factors was 0.863.

Limitation on Consumable:

The third component named 'Limitation on Consumable' because of its contents and it comprises three factors determining the demand for affordable housing in Malaysia. Specifically, it explained 12.766 per cent in the model and the factor loadings for the three factors ranging from 0.833 to 0.922. A second-order factor analysis combined these three factors into a single component of 'Limitation on Consumable'. The KMO measure of sampling adequacy indicated a good relationship (MSA = 0.668, x2 (3) = 696.735, p<0.001). This confirms the relationship between the factors. The three factors collectively explained 75.676 per cent in this model. The validity ranges from 0.695 to 0.850, house built-up area will leave with the least validity. The collective Cronbach's alpha reliability for the three factors was 0.831.

Satisfaction:

The fourth component named 'Satisfaction' because of its contents and it comprises two factors determining the demand for affordable housing in Malaysia. Specifically, it explained 10.472 per cent in the model and the factor loadings for two factors both are 0.935. A second-order factor analysis combined these two factors into a single component of 'Satisfaction'. The KMO measure of sampling adequacy indicated a good relationship (MSA = 0.500, x2 (1) = 430.354, p<0.001).

This confirms the relationship between the factors. The two factors collectively explained 87.364 per cent in this model. The two factors contain the same validity which is 0.874. The collective Cronbach's alpha reliability for the two factors was 0.827.

Neighbourhood:

The fifth component named 'Neighbourhood' because of its contents and it comprises two factors determining the demand for affordable housing in Malaysia. Specifically, it explained 9.960 per cent in the model and the factor loadings for both factors are 0.885. A second-order factor analysis combined these two factors into a single component of 'Neighbourhood'. The KMO measure of sampling adequacy indicated a good relationship (MSA = 0.500, x2 (1) = 203.212, p<0.001). This confirms the relationship between factors. The two factors collectively explained 78.293 per cent in this model. The two factors contained the same validity which is 0.783. The collective Cronbach's alpha reliability for the two factors was 0.720.

Debt Impact:

The sixth component named 'Debt Impact' because of its contents and it comprises two factors determining the demand for affordable housing in Malaysia. Specifically, it explained 7.415 per cent in the model and the factor loadings for both factors are 0.876. A second-order factor analysis combined these two factors into a single component of 'Debt Impact'. The KMO measure of sampling

adequacy indicated a good relationship (MSA = 0.500, x2 (1) = 177.036, p<0.001). This confirms the relationship between factors. The two factors collectively explained 76.719 per cent in this model. These two factors contain the same validity which is 0.767. The collective Cronbach's alpha reliability for the two factors was 0.695.

4.4 Summary

Altogether, 115 valid housing industry expert survey forms were received and used for this research. In order to test the measures of goodness of the factors causing the increase in housing prices, Cronbach's alpha reliability and validity tests were performed. The reliability and validity tests indicated that the factors were suitable for the aim of this research. To further confirm the strength of the data, Bartlett's test was conducted, and the results signified a lack of multicollinearity among the factors and that the respondents were drawn from those with similar experiences $(\chi^2 (210) = 1438.685, p<0.000)$. The KMO is 0.720 and the R-matrix is 1.303E-006. One sample t-test was computed to determine the hypothesis that each of the factors will cause an increase in the housing prices. The results of the t-test, where it can be found that (i.e. Pr>|t|) for each of the causes (H_r: $U>U_0$), were significant. The small standard errors, being near to zero suggested that the measurements of the respondents with respect to the factors are representative. All the factors are statistically significant. Therefore, all the factors are adequate and suitable to be included in the survey to achieve the aim of the research.

Besides, for the measurement of the extent availability in construction materials, Cronbach's alpha reliability and validity tests were performed. The reliability and validity tests indicated that these factors were suitable for the aim of this research. To further confirm the strength of the data, Bartlett's test was conducted, and the respondents were drawn from those with similar experiences (χ^2 (91) = 485.853, p<0.000). The KMO is 0.655 and the R-matrix is 0.011. One sample t-test was computed to determine the hypothesis that each of the construction materials will be available. The results of the t-test, where it can be found that (i.e. Pr>|t|) of each of the causes (H_r: $U>U_0$), were significant. The small standard errors, being near to zero suggested that the measurements of the respondents with respect to the construction materials are representative. All factors are statistically significant. Therefore, all the construction materials are adequate and suitable to be included in the survey to achieve the aim of the research.

The valid survey forms from 529 home users were received and used for this research. In order to test the measures of integrity in the factors determining the demand for affordable housing in Malaysia, the Cronbach's alpha reliability and validity tests were performed. The reliability and validity tests indicated that these factors were suitable for the aim of this research. To further confirm the strength of the data, Bartlett's test was conducted, and the respondents were drawn from those with similar experiences (χ^2 (210) = 10953.982, p<0.000). The KMO is 0.518 and the R-matrix is 7.152E-010. One sample t-test was computed to determine the hypothesis that each of the factors will determine the demand for affordable

housing in Malaysia. The results of the t-test, where it can be found that (i.e. Pr>|t|) of each of the causes (H_r: $U>U_0$), were significant. The small standard errors, being near to zero suggested that the measurements of the respondents with respect to the factors are representative. All the factors are statistically significant. Therefore, all the factors are adequate and suitable to be included in the survey to achieve the aim of the research.

CHAPTER 5

DISCUSSION OF FINDINGS

5.1 Introduction

This chapter discusses the concerns of the research findings. The chapter will be discussed in accordance with the objectives; therefore it is divided into three parts. Part one discusses the factors causing the Malaysian housing prices to increase. Part two discusses the extent of availability of construction materials. The final part discusses the factors determining the demand for affordable housing.

5.2 Discussion on Factors Causing Malaysia Housing Price to Increase

The location has the highest influence on housing price according to all the respondents. About 88% of the respondents measured that housing location has the highest impact on housing price. This result can be predicted because the price of lands and the associated costs related to land varied extensively due to location factor. Lands in the cities are very expensive compared to lands outside the cities.

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Regulations on lands and construction in the cities are also very strict, especially for affordable housing. This finding is supported by Ernawati et al, (2016), where from a developer's perspective, the main factor that influences the housing price is location. Location of the development equipped with good design specifications, proper infrastructure and high quality, can influence the housing price. Lyndall and Chris (2012); Wang and Li (2006); Michael and Rebecca (2002) stated that housing prices may increase by having proper facilities and infrastructure in the housing area (Ernawati et al, 2016). In order to solve the location (rural or urban) issue, household confidence on future price and climate changes will be influenced. The urban area will increase the households' confidence while rural will be of the opposite. Due to the shortage of the land in the urban area, the hill site and sea site development are increasing. The impact of the hill site and sea site development will be easily affected by climate changes such as landslides.

It is also not surprising that the respondents rated the size of the house as the second most influential factor for housing price. This is because the costs of construction are determined by the size of the house. For instance, in Malaysia, houses are priced at RM1,200/ m^2 in Kuala Lumpur. A study carried out by Opoku and Abdul-Muhmin (2010) found that the bedroom size, the number of bedrooms and the number of bathrooms in Saudi Arabia, are the major housing components that influence house prices (Musa and Wan Zahari, 2015).

It is interesting to find that innovation and skills are considered as the next most influencing factors in housing prices which were not expected. However, construction costs are significantly influenced by the level of technology employed by the developers and construction on site. For instance, consultants' fees, claims and delay can also be reduced by using software like BIM. Better skills and more innovation can also reduce the housing costs while improving the quality. In order to reduce innovation and skills, leasehold or freehold houses will be influenced.

The developer's profit margin was also rated as a major factor that would cause the price of a house to increase or to reduce. This is interesting, and the finding is not surprising because a previous research has reported that the profit margin of Malaysian developers is very high at around 20 per cent (Lim et al, 2015). Strategic factors, location, leasehold or freehold house, stamp duty, permit fees, currency exchange rate, household confidence on the future price, interest rate, geographical factors and rising labour costs will influence the developer's profit margin.

Strategic factor, marked by the proximity of the housing to schools, hospitals, place of works, and the market was also rated to be a major determinant of housing prices. This is expected because housings that are close to children's schools, markets, and workplaces are preferable by homebuyers. For strategic reasons, a reduction in the cost of transports because of accessibility,

conformability and convenience also have their influence (Olanrewaju et al, 2016). In order to solve the strategic factor, the developer's profit margin and climate changes will be influenced. The developers should lower down the profit margin and provide more affordable houses at strategic locations.

Material cost constitutes about 60 per cent of the housing construction price. Therefore, shortage and the associated increase in the cost of materials will have a significant impact on the housing price. Therefore, it is not surprising that shortage and availability of materials were rated as important factors in the estimation of housing price. Anosike (2009), Mekson (2008), Mohammed (2008) and Njoku (2007) stated that the cost of building materials represents a critical risk to both the construction industry and people aiming to own houses (Akanni et al, 2014).

It is interesting that the respondents also responded that the labour cost would increase housing prices. This rating may be explained because the housing industry is labour intensive and most of the site operatives are from the neighbouring countries. With government regulations on foreign labours, some projects had already been impacted greatly. Besides, it was reported that the professional and highly skilled labours hired in a project increased the construction cost and it transmitted to increase the housing price (Ernawati et al, 2016).

Economic uncertainty and financial risks were also measured as influential contributors to housing price. The profit margins of developers and contractors depend on the economic situations of a country, especially due to imported goods and materials. Developers tend to reduce their investment in order to reduce their exposure to financial risks. Construction business involves large investments and as a result, the developers also depend on loan from the banks for construction projects. During the recession, most businesses, including housing developers tend to reduce their activities to reduce losses.

As previously stated, prices of lands have the greatest influential impact on the housing price. Therefore, restriction on the use of the land would undoubtedly upset the fee of construction and eventually the price of the completed housing.

Quality of materials was also found to contribute dominant bearing on the prices of houses. This is not surprising because the quality of the materials determines the housing production costs like any other goods and services available in the market.

The type of land ownership was also cited as another major factor influencing the prices of houses. This finding is not very surprising because leaseholders will not only have to worry about the grant rent on the land whether freehold or leasehold. This is consistent with the literature. The developers'

decision on housing price will be influenced by the land status, whether leasehold or freehold (Ernawati et al, 2016). Developers usually fixed a higher price on freehold land than on leasehold land. Housing prices will be influenced by the need for reclamation and re-zoning of the land (Ernawati et al, 2016).

The respondents also measured that climate change will affect housing prices. This finding is not difficult to agree with as heavy rainfalls, floods, mudslides are gradually becoming part of homebuyers' checklist in Malaysia. Homebuyers are now demanding for houses that would be resistance to impact of earthquakes, landslides, and mudslides especially those on the hillsides (Olanrewaju et al, 2017).

Interest rates have a significant impact on the cost of home production. Technically, developers and contractors will transfer the amount they pay for interest to the homebuyers and this will, in turn, lead to increase in the housing prices. The previous researcher ranked it at second most important factor. Based on the developers, it was observed that when the interest rate is low, there will naturally be a high demand for houses and can further impact the developers' choice for the housing price (Ernawati et al, 2016).

It is interesting that the respondents also measured that the household's confidence in future price would increase the housing prices. This rating may be

explained because property investors in urban cities, especially in strategic location contribute to the conjecture that had increased the housing price.

The number of the new house being built was also found to make dominant bearing on the prices of houses. This finding is not surprising because a large amount of housing being built in the same area will definitely affect the sales of the houses. Developers will have to compete for prices or hold promotion in order to attract homebuyers.

The respondents also measured that geographical factor will affect the housing price. This finding is not difficult to agree with because easy access to public and private services, beautiful views and road connections carry the advantages to homebuyers in Malaysia.

Available facilities such as playground, garden and swimming pool have a significant impact on the cost of home production. This rating can be explained because the lifestyle and standard of living in Malaysia have improved over the years. This finding reflects the research by Ernawati et al. (2016), which stated that the standard of living and lifestyle have contributed to the choice in determining the housing price by the developers.

The layout of the house was also cited as the factor influencing the price of houses. This finding is very surprising because most of the houses have the typical layout such as three bedrooms and two bathrooms. This rating can be explained because it requires more time and cost for the designer to design a better or more creative layout of the house.

Regarding the stamp duty, the developers and contractors tend to transfer this amount to the homebuyers and this will, in turn, lead to increase in the housing prices.

As previously stated, material cost constitutes about 60 per cent of the housing construction price. The cost of imported materials will affect the currency exchange rate. This will influence the housing price.

The respondents also measured that permit fees will affect the housing price. The developers and contractors will also transfer the permit fees amount to the homebuyers and this will, again in turn, lead to increase in the housing prices.

Using principal component analysis, 21 causes were grouped into seven factors. The factors were financing cost, macroeconomic, return on investment, supply chain, infrastructure demand, housing price index and plot ratio.

Financing cost factor comprises four factors. All these factors relate to financing cost, permit fees and stamp duty influence the layout of the house and the category either leasehold or freehold house. The government has provided reductions or exceptions to the developers developing affordable housing in strategic locations. This privilege was also provided to households who built on privately owned land as announced in the 2017 Budget. .

The macroeconomic factors comprise the rising labour costs, geographical factors and economic uncertainty and financial risks. The implication of these results indicates that economic uncertainty and financial risks and geographical factors will influence the rising labour costs. For the example scenario of during the recession of economic, construction workers at higher risk area such as hill site and sea site will demand higher pay for their works especially among foreign workers (IWBC, 2018).

Return on investment comprises three factors of developers' profit margin, innovation and skills, number of new houses being built and climate changes. This means that innovation and skills, the number of new houses being built, and climate changes will influence the developers' profit margin. All these factors are related to the developers' return on investment.

Supply chain factors comprise three factors causing the Malaysian housing price to increase. The results indicated that shortage of material, quality of material and component used and location (urban or rural) are considered by the developers during the design stage to supply housing.

Infrastructure demand factors comprise two related factors, namely, the availability facilities and currency exchange rate. The results mean that the currency exchange rate for import facilities will influence the number of available facilities. All these factors are related to the infrastructure demand.

Housing price index comprises three factors which are household's confidence on the future price, strategic factors and interest rates. The results indicated that the strategic factors will influence the household's confidence on future price and the bank loan interest rate. Strategic location will increase the housing demand. Therefore, the household will have more confidence in the future price of the house.

Plot ratio comprises two factors of planning restriction on the use of land and size of the house. This means that the use of land and the maximum size of the house will be restricted by the land authorities. It influences the developer either to construct high rise or landed houses.

5.3 Discussion on Extent of Availability of Construction Materials

The formwork was considered as the highest risk of construction materials with unstable supply during construction according to all respondents. 44 per cent of the respondents measured that formwork faces unstable supply during construction. Formwork supply volume has been reduced in number, but the export prices kept increasing. Due to supply shortage, but high demand, the price continues to uptrend (The Star, 2017).

It is also surprising that the respondents face unstable material supply during construction. This may due to the delivery arrangement of aggregates. In 2014, aggregates are one of the construction materials warned as might face the shortage. Shortage of construction materials will cause the increase in construction cost and burden the builders (The Edge Market, 2014).

It is not difficult to accept that reinforcement bars face unstable supply during construction. Overcapacity in China's steel industry led to a surge in cheap steel exports globally, including to Malaysia, where it significantly affected the local steel industry during the period between 2012 and 2015 (IBC, 2017). Besides, local steel manufacturers are also faced with rising operational cost in terms of energy, labour, exchange rate and raw materials (IBC, 2017).

Surprisingly, the respondents measured that they face unstable supply of sand during construction. There was no shortage of sand in Malaysia currently. Malaysia still managed to export sand to India (The Star, 2017). The Karnataka State Government hopes that the Malaysian export will ensure availability of sand at an affordable price (The Sun Daily, 2017). Sand is one of the construction materials being warned that might face the shortage in 2014 (The Edge Market, 2014).

There is no unstable supply of paint during construction globally. There is also no shortage of paint in Malaysia currently. The demand in special colour requires an advance order to avoid unstable supply during construction.

Ironmongeries do not face unstable supply during construction. Large quantities of ironmongeries required an advance order to avoid unstable supply. Special ironmongeries usually take time to fabricate.

There is no unstable supply of bricks during construction. There is no shortage of bricks in Malaysia currently.

The tiles do not face unstable supply during construction. Unstable of tiles will only be faced when there is no more production of the model or the quantity

ordered is missed. Quality check of tiles is very important, where different batches of production may cause differences in the colour. Bulk order is always encouraged.

There is no unstable supply of rainwater goods during construction. Besides, there is no shortage of concrete in Malaysia currently. Ready-mixed concrete is one of the construction materials being warned that might face the shortage in 2014. Shortage of supplies may lead to price instability, therefore, affecting the whole value chain (The Edge Market, 2014).

There is no unstable supply of cement during construction. Malaysia has enjoyed continuous growth in cement demand since 2009, but the supply exceeded the demand in 2016. This was due to higher production capacity and contraction in local demand of about seven per cent compared to the previous year (IBC, 2017).

There is no shortage of waterproofing, windows and doors in Malaysia currently. Large quantities of these construction materials require an advance order to avoid unstable supply. Windows and doors usually take time to fabricate and are customised accordingly.

5.4 Discussion on Factors Determine the Demand for Affordable Housing

The crime rate was considered as the most important factor determined by the demand for affordable housing according to all respondents. About 82 per cent of the respondents measured that the crime rate has the highest impact on affordable housing demand. This result was expected because the crime rate in Malaysia is high, especially in urban cities such as Kuala Lumpur. The homebuyers will consider the in-house security to protect their personal safety. The finding is supported by Zainon et al, (2017), where house buyers wish to live in a safe surrounding, such as in gated and guarded residential area with security guards patrolling. Snatch theft and burglary cases within the housing area causes concerns among homebuyers for their safety due to the increasing crime situation in Malaysia (Zainon et al, 2017). The previous researcher found that house buyers are willing to pay for security safety. Better security measures can indoctrinate a sense of trust and ease of mind for the residents (Tan, 2010). Ghani (2008) and Zyed et al. (2016) argued that crime rate is a serious issue for many (Olanrewaju & Tan, 2017). In order to reduce the crime rate, increasing household income will minimise the crime rate due to the residents in Malaysia having sufficient income for expenses, the quality of house on safety component will be increased. Neighbourhood environment will be better when the crime rate reduces.

It is also not surprising that the respondents rated the house price as the second most influential factor in affordable housing demand. This is because the homebuyers will consider the price of the house, whether affordable to buy and own the house. A study carried out by Zainon et al. (2017), found that to purchase and own a house is the most important factor influencing house pricing. In order to solve the house price, the household income plays an important role. The increase in household income enabling the purchase of houses at various price range. The reduction of house price may influence the quality of the house.

It is not difficult to accept that down payment is considered as the next most influencing factor on the demand for affordable housing. This is expected, normally 10 per cent of down payment to buy or own a house. The government provides a few housing schemes for the first-time homebuyers by assisting with the deposit or down payment. In order to solve the down payment issue, the household income needs to be increased, the attractive interest rate of the housing loan is required for the homebuyers and the accessibility to the workplace must be convenient for the homebuyers to save on the transportation fees.

The accessibility to working place is also rated as a major factor that would determine the demand for affordable housing to increase or reduce. Housings near workplaces are preferable to homebuyers because of a decrease in cost of transportations due to accessibility, conformability and convenience reasons

(Olanrewaju et al, 2016). As pointed by Wan et al. (2010), housing should be near to the workplace and the city centre so that concept of work and live can be applied (Zainon et al, 2017). Households want their homes located easily to access to the place of employment (Tan, 2010). In order to solve the accessibility to working place, the availability of public transport and own transport is important. The availability of public transport and own transport will ease access to the working place.

The quality of the house, marked by the defects was also rated to be a determinant of demand for affordable housing. This is expected because housings with a minimum defect will reduce the cost of maintenance. The quality of the house is related to the minimal building defects (Zainon et al, 2017). In order to solve the quality of the house, it is influenced by the house price, crime rate and down payment.

The type of land ownership was also cited as the major factor determining the demand for affordable housing. This finding is not surprising because the land will be reverted back to freeholder on the expiration of the tenure and the leaseholders will not only have to worry about the grant rent on the land. As reported in the study of Tan (2010), homeowners prefer freehold properties because they feel they owned the land, and may even obtain higher margins of financing.

The interest rate on loan will have the significant impact on the demand for affordable housing. The higher interest rate will cause burden for the homebuyers. Years of repayment and amount of loan will affect the interest rate. Xu (2017) stated that a certain extent of real estate investment will reduce from increased interest rates due to real estate markets explode. Meanwhile, it causes the homebuyers to pay more to invest in the house.

Access to children's school and child day care centre is also measured as an influential demand for affordable housing. This is expected because housings that are close to children's schools allow easy accessibility to the parents, and conformability and convenience reasons help them to save expenses on transportations (Olanrewaju et al, 2016). Bayoh et al (2006) stated that in the United States of America, research found that the major determinant attracting homebuyers to the cities is the quality of schools (Olanrewaju & Tan, 2017).

It is expected that household income was also found to make dominant bearing on the demand for affordable houses. This is not surprising because the household income determines the housing loan and the range of housing price to buy and own. Olanrewaju & Tan (2017) found that the household income was the most important determinant of the research. IREM (2006), found that the households' economic activities and demand pull was the major factor that creates value. Therefore, there will be demand for more residential buildings when

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household incomes increase (Olanrewaju & Tan, 2017). Wu et al. (2013) stated that in Beijing, household income is the major cause in residential location decision (Olanrewaju & Tan, 2017). Regional and neighbourhood analyses would often be conducted by the developers to determine their prices and to initiate the housing supply. Quigley and Raphael (2004) argued that households in the lower quintiles of the income will use a large amount of their income in house rental costs (Olanrewaju & Tan, 2017). The households which rent houses are due to inability to afford a house. The increasing in the house price will reflect to the increasing of the fees of house rental.

It is interesting that the respondents also measured that the ability to accommodate those with mobility restriction would increase demand for affordable housing. This rating may be explained because before 2000's, the low-rise buildings do not provide an elevator, it causes inconvenience for the disabled and elders.

Owning transports was also found to make dominant bearing on the demand for affordable housing. This is not surprising because the limited parking space will cause the issue to the homebuyers who have more vehicles. Having own transports means access to school and working place, the homebuyers have more opinion on selecting the preferable house. Many households own car(s) due to the inefficiency of public transportation system (Olanrewaju & Tan, 2017). The Nielsen Global

Survey of Automotive Demand (2014) found that car ownership is low crosswise over Southeast Asia at around 50 per cent, but car ownership in Malaysia is at 93 per cent (Olanrewaju & Tan, 2017).

The neighbourhood was also cited as the major factor influencing the demand for affordable housing. This finding is not very surprising because Rohe and Steward (1996) argued that sociality is the first step towards involvement in local housing area organisations. Residents are able to solve similar problems by meeting up, discussions, negotiation and co-operation (Tan, 2010).

The respondents also measured that house built-up area will affect the demand for affordable housing. This finding is not difficult to agree with, number of family members, number of rooms and number of bathrooms are gradually becoming parts of homebuyers' checklist. Homebuyers are now demanding for houses that would have a sufficient built-up area to fit all the family members.

Availability of mortgages has a significant impact on the demand for affordable housing. Basically, banks and government will have loan plans and affordable housing scheme for the homebuyers. The greatest challenge faced by the homebuyers is securing a mortgage from banks (Olanrewaju & Tan, 2017). Usually banks provide only 70 to 80 per cent loan, but about 50 per cent of loan applications were rejected due to the limitation of the credit limit set by Bank Negara Malaysia.

To approve the housing loan, the bank will study the homebuyer background financial. However, REHDA is offering to deliver a "bringing loan" to homebuyers (Olanrewaju & Tan, 2017). In 2017, the public servants' housing loan has been increased by the government from RM120,000 and RM600,000 to RM200,000 and RM750,000 (Olanrewaju & Tan, 2017).

The respondents also measured that family size will affect the demand for affordable housing. This finding is not difficult to agree with because the larger the family size, the larger house is required by the homebuyers. The financial consequences are very different for large family size compared to small households. The homebuyers will consider the size of the house and the family size before selecting their preferred house. Olanrewaju and Tan (2017) found that homebuyers opt to purchase a house that suits bigger families.

It is interesting that the respondents also measured that the operation and maintenance cost will affect the demand for affordable housing. This rating may be explained because the homebuyers are required to pay the monthly operation and maintenance fees and is considered as part of the household expense. House with elevators, guarded gates, swimming pool and other facilities will cost higher operation and maintenance cost.

Adaptability was also found to make dominant bearing on the demand for affordable housing. The finding referred to the acceptability on the design and the layout of the house. This finding is not difficult to accept because homebuyers will consider the finishes and the layout of the house.

The respondents also measured that the type of house will affect the demand for affordable housing. This finding is not surprising where landed houses in urban cities will cost higher price than high-rise housing because of the shortage of land. The ratio between landed and high-rise housing units is about 30:150. Previous research found that the type of building is extremely important (Olanrewaju and Tan, 2017).

Availability of credits or loans has a significant amount of impact on the demand for affordable housing. Homebuyers will purchase their house if it is available for credit or loan. Besides banks, the government also provides a housing loan scheme for the first-time homebuyers.

The availability of public transport was also cited as the factor influencing the demand for affordable housing. This finding is not available for transportation provides easy access to workplace, school and public or private service centre. Public transport mainly related to the location, such as close to their workplace or schools and colleges. Availability of public transport will minimise the daily

expenses on cars. So et al. (2017) discovered that access to public transport is a vital determinant of house prices in Hong Kong (Olanrewaju & Tan, 2017). The main reasons measured by the household were associated with the high cost of fuel, commute times and other connected problems with housing location (Olanrewaju & Tan, 2017). Knight Frank (2015) stated that properties closer to Mass Rail Transit, Light Rail Transit are costly and in high demand, and it also has more appeals to the homebuyers (Olanrewaju & Tan, 2017).

Market or shopping malls will affect the demand for affordable housing. Zainon et al. (2017) argued that supermarkets and convenience stores near to the housing area allow the residents to buy daily necessities such as groceries and household needs. Residences have the perspective that public facilities such as playgrounds for children, clinics, and places of worship are to be situated nearby (Zainon et al., 2017).

Using principal component analysis, 21 determinants were grouped into six factors. The factors were transportation cost, repayment, limitation on consumable, satisfaction, neighbourhood and debt impact.

Transportation cost comprises seven factors. All these factors are related to transportation cost that the homebuyers consider in purchasing a house. The homebuyer is looking for good design of their neighbourhood which is considered

to have good public transportation which may help them to save on the transportation cost, the car operation and the maintenance cost. In return, the amount could be useful for their house down payment.

The repayment factors comprise the household income, interest rate on loan, the quality of the house, accessibility to workplace and family size. The implication of these results indicates that homebuyers focus on ensuring that their household income, whether affordable for their daily usage for their family size and for paying their housing loan. Better accessibility to workplace may reduce the cost of transportation and it enables for repayment.

Limitation on consumable comprises three factors of market or shopping mall, type of house and house built-up area. This means that homebuyers consider these limitations on consumable when purchasing affordable house. House built-up area limits the consumption.

Satisfaction factors comprise two determinants on demand for affordable housing, which are the house price and adaptability. The results indicated that house prices and adaptability of the house are considered by the homebuyers when they purchase affordable housing. The house price will affect the finishes and the layout of the house. The homebuyer may purchase a cheaper house and use the balance money to renovate or design the house. If the homebuyers purchase an expensive

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house, then they might not have sufficient money to make some renovation or design for the house.

Neighbourhood factors comprise two related factors, namely, crime rate and either leasehold or freehold. The results mean that the homebuyers are concerned about crime rates and whether the house is leasehold or freehold when they purchase affordable housing. Crime rate relates to the price of the house. Low-cost housing has a higher crime opportunity due to the mixture of different residential classes.

Debt impact comprises two factors which are the availability of mortgages and access to children's school and the child day care centres. The results indicated the availability of mortgages and convenient access to their children's schools and child day care centres were factors which affect the demand for affordable housing. Easy access to children's school and child day care centres will enable for saving more cost for mortgages.

5.5 Summary

The chapter discusses in accordance with the objectives. Part one discusses the factors causing the Malaysian housing price to increase where the location was

considered as the main influencing factor in the housing price according to all respondents which consisted about 88 per cent of the respondents. This result is expected because the price of lands and the associated costs related to land are varied extensively. Part two discusses the extent of availability of construction materials, with the formwork having the highest risk of unstable supply construction materials during the construction project according to the entire respondents. 44 per cent of the respondents measured that formwork faces unstable supply during construction. Its supply volume has been reduced, but the export prices keep increasing. The final part discusses the factors determining the demand for affordable housing where the crime rate topped as the factor according to the entire respondents. About 82 per cent of the respondents measured that the crime rate has the highest impact on affordable housing demand. This result is expected because the crime rate in Malaysia is high typically in urban cities such as Kuala Lumpur. Therefore, the homebuyers will consider in-house security for protection.

CHAPTER 6

CONCLUSION

6.1 Introduction

This chapter provides the concluding part of this research. In addition, this chapter highlights the research limitation as well as the areas that require further research in the context Malaysian affordable housing.

6.2 The Conclusion to the Research

This research aimed to develop a framework to deliver affordable housing. In order to achieve the aim, the research outlined three objectives that provide the framework and focus that guide the fulfilment of the research design. The conclusion of the research will be presented in three parts in accordance with the research objectives, but initially, the summary of the respondents' profiles is presented. Following are the three research objectives:

1. To analyse the factors causing the Malaysian housing prices to increase

2. To analyse the extent of availability of construction materials

3. To analyse the factors determining the demand for affordable housing

To summarise the housing industry survey of industry professionals, the majority of the respondents hold at least a bachelor's degree in construction-related disciplines. More than 50 per cent of the respondents have more than five years of working experience in construction industry. Five years of working experience in the industry is considered adequate as the respondents possess a minimum knowledge of the Malaysian construction industry. The analysis revealed that 35.7 per cent of the respondents are holding the position as an architect in their respective organisations. Therefore, taking this profile as a basis, it is considered that their opinions on the Malaysian construction industry are sufficient to report the findings of this research.

To summarise the home users' profile, there are 57 per cent have children in their respective families. The analysis showed that the majority of the respondents possess bachelor's degree. More than 75 per cent of the respondents live in condominium. The analysis revealed that 85 per cent owned their house. The majority of the current housing price ranges between RM300,000 to RM399,999. The household income is between RM2,000 to RM3,999 every month. Therefore, on the basis of the respondents' profiles, it is considered that their opinions on the

demand for affordable housing in Malaysia are sufficient to report the findings of this research. These profiles are considered sufficient to report the findings of this research.

In respect to the first objective, 21 variables that will cause Malaysia housing prices to increase were identified. The respondents were requested to express their opinion as to the factors that will cause Malaysia housing prices to increase. Respondents were asked based on their point of view to classify each of the techniques according to five-point Likert's scale. The data also suggested that only 6.54 per cent of the respondents responded as strongly agree, 36.85 per cent of the respondents agree and 31.80 per cent of the respondents slightly agree. Besides, 19.17 per cent of the respondents disagree and only 5.63 per cent of the respondents strongly disagree. Therefore, more than 75 per cent of the respondents agree on the factors stated in the survey.

The practical implications of the findings reported in this research are that the government needs to lessen its regulations and control on the use of lands in order to increase homeowners and also to reduce the authorities' development charges or fees. The government should waive the authorities' fees to developers who are willing to cooperate on the development of affordable housing. The waived fees will save the cost, therefore, the developers could reduce the housing price

accordingly. The developers also need to reduce their profit margin expectations through proper risk assessment and reduction.

The second objective of the research was to analyse the extent of availability of construction materials. Fourteen construction materials that might face unstable supply during construction were identified. The respondents were requested to tick against each variable based on a Likert scale of five points. The outcome of the research reveals that about 80 per cent of the respondents responded that the construction materials have a low storage supply during construction.

It was found that the market has the low risk of unstable of construction materials supply during construction. Unstable supply can be solved by ordering the material in advance and allowing for the time cost fabrication. Moreover, planning on the delivery schedule for construction material will reduce the risk of unstable construction materials supply.

The third objective of the research was to analyse the factors determining the demand for affordable housing. To measure this objective, 21 variables that determine the demand for affordable housing were identified. The respondents were requested to express their opinions as to what are the factors that determine the demand for affordable housing. Respondents were asked based on their own point of view to classify each of the techniques according to five-point Likert's

scale. The data showed that only 31.34 per cent of the respondents felt that the response as "extremely important", while 29.20 per cent of the respondents measured all the factors as "very important", 33.46 per cent of the respondents responded as "important", 5.88 per cent of the respondents measured all the factors as "low important" and lastly only 0.11 per cent of the respondents measured as "very low important". Therefore, as a summary, about 61 per cent of the respondents agreed with the factors stated in the survey.

It was found that the housing providers are required to consider the safety and security around the housing area to increase the home users' comfortable and safe feeling in the house they live. Housing provider also has to be concerned on home users' needs to increase the demand of affordable housing delivery.

Therefore, all the information will become a guideline for the policymakers, urban planners, developers, homebuyers, and contractors during their housing decision-making processes. The theoretical purpose is to ensure the view of homebuyers on the demand for affordable housing. The policymakers, urban planners, developers, and contractors would have the capacity to make adequate profit margins. Policymakers, urban planners, developers, and contractors should be the concern on the demand of affordable housing with the housing prices in Malaysia particularly in Kuala Lumpur, Penang and Johor.

6.3 Limitation of the Research

This research is for the award of a master's degree and the research is expected to complete within the period of three years. Time constraint was the main limitation of this research. The home users' survey was only conducted in Penang due the time constraint, and the number of respondents involved in this research may not represent the entire population of the home users in Malaysia.

Besides, the low response rate from the housing industry experts is one of the limitations of this research. The imbalance of data may affect the authentication of this research. The analyses and outcomes of this research may not be sufficient to represent the perception of the entire population of the housing industry experts in Malaysia.

6.4 Area Requiring Further Research

Arising from the findings of this research, the followings are the recommendation for further studies:

a. Studies could investigate the relationships between the factors causing the Malaysian housing prices to increase and the factors determining the demand for affordable housing.

b. Studies could investigate various states of respondents to achieve a greater accuracy in the research on factors determining the demand for affordable housing.

6.5 Summary

The first objective of the research was to analyse the factors causing the Malaysian housing prices to increase. The government needs to lessen its regulations and control on lands in order to increase homeowners and also to reduce the authorities' development charges or fees. The second objective of the research was to analyse the extent of availability of construction materials. Planning on the delivery schedule for construction materials will reduce the risk of unstable of construction materials. The third objective of the research was to analyse the factors determining the demand for affordable housing. Housing providers need to consider the safety and security aspects within and around the housing area to let the home users feel comfortable and relief on the house they live. Therefore, all the information will become a guideline for the policymakers, urban planners, developers, homebuyers, and contractors during their housing decision-making processes.

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APPENDIX A

Strategies For Affordable Housing Delivery

[1]X.Y. Lim, [2]A.L. Olanrewaju , [3]S.Y. Tan

[1]Xin Ying Lim, University Tunku Abdul Rahman, Department of Construction Management, Faculty of Engineering and Green Technology, 31900. Perak. Malaysia.
[2]AbdulLateef Olanrewaju, University Tunku Abdul Rahman, Department of Construction Management, Faculty of Engineering and Green Technology, 31900. Perak. Malaysia.
[3]Seong Yeow Tan, University Tunku Abdul Rahman, Department of Construction Management, Faculty of Engineering and Green Technology, 31900. Perak. Malaysia.

ABSTRACT

Currently Malaysia has a housing shortage of 12 million but towards the year 2020, this would require a minimum annual supply of 2 million homes. But, even if the current rate of supply is double for the next 40 years, the population remains the same [at 30 million] and there is no migration to the cities, there is high possibility that housing crises will remain for a long time. Despite the government concerted efforts to provide adequate housing by way of subsidizing construction and providing incentives to developers, the housing supply and distribution gaps are growing and there is surge in costs of affordable housing. However, there is often the need for causal link between the cost factors through quantifying and measuring their impact on housing costs. Therefore, the need arise to develop housing delivery index in an effort to improve housing delivery. This paper reports a study that develop quantitative index for affordable housing economics to enable suitable and accuracy of decision making process. This is achieved by measuring the factors that predicting the costs of affordable housing. The study involves survey questionnaire involving developers, contractors and a consultant. **The study found that finance, developer's profit margin** and compliance costs were the major costs contributing to affordable housing delivery. The research will be useful to the policy makers, developers, manufacturers, suppliers and buildings users.

INTRODUCTION

This paper reports part of ongoing research involving the development of models for affordable housing delivery. Shelter is a necessity. The provision of adequate housing is concern of government globally. The commitments of government towards providing affordable housing to all Malaysian are impressive. The provision of affordable and livable social housing is very critical particularly as the government is committed to encourage greater home ownership among the **'bottom 40% households'.** By 2020, over 70% of Malaysians are expected to reside in the urban areas. The Greater Kuala Lumpur alone is expected to accommodate additional one million residents by 2020 (National Transformation Programme, 2010). Housing requirements are expected to remarkably increase due to the rapidly growth in population, increase in foreigners (expatriate, students and tourists), migration, changing economic status of the citizens, change in tastes, and dilapidation of the existing stock. This will affect the low – medium, medium cost and high cost. While the requirements for housing need for the poor and low cost will remain, but emphasis will be shifted to vibrant house that is commensurate with the country status. To carter to the housing government has embarked on the provision of affordable housing. The concept affordable housing emerges in the 20th century after World War II. Affordable housing means different things to different people. However, the basic principle of affordable housing is the same as it is considered if the occupants or owner will not spend more than 30% of their income for the rent or mortgage payment (Sidawi, 2008; Queensland government-Department of housing, 2004). The aim of affordable housing is to provide the low and middle income groups homes that are adequate in all respects. **Though, 'affordable housing' has many** meanings and interpretation but is largely same. But one common basic trend that is common to all the

Corresponding Author: Lim, University Tunku Abdul Rahman, Department of Construction Management, Faculty of Engineering and Green Technology, 31900. Perak. Malaysia.
6012-5884600; E-mail: xinyinglim0708@gmail.com

different definitions is that it is a measure of the affordability of homes to the lower and the middle income earners. The primary factor that is used to determine the affordability of home is the disposable income of the household. To interpret, affordable housing is the housing that is priced below the median income of the society. In Malaysia the medium monthly salary is RM3, 626 (Department of Statistics, 2012). Based on this common standard, that is widely accepted, affordable housing should cost less or equivalent to 3X annual median income. On this basis, homes in Malaysia are one of the most expensive in the world. In the efforts to influence affordable housing economies, this study employed the Analytical Hierarchy Process (AHP), techniques to prioritise affordable housing cost. Providing affordable housing in Malaysia is high consideration, however, there are criteria that contribute to the cost of housing. A problem thereby arises on which variable is the most important and which requires less consideration. Authors often used the normal rating system based on measures of centers in making decisions of the cost distribution. But the results from the traditional methods are faced with criticisms due to inherent problems. The AHP is chosen because it can elicit the biasness of respondents in data as compared to the normal raring stating and can achieve higher consistency (Cheng

and Li, 2001). AHP is simple and adaptable to handling difficult real-life problems.

Literature Review:

Population in Malaysia are greatly increasing, in year 2010, the population is only 28.59 million, while in year 2015, the population increase to 30.44 million (Department of Statistics, 2015). Malaysia aims to be a fully developed country by the year 2020. The estimated population in year 2020 is 32.4 million, comprising 16.6 million male and 15.8 million female (Department of Statistics, 2015). While there high housing deficits, towards the 2020 and beyond more people will require homes. The residential unit in year 2013 is 4,725,109 units (NAPIC, 2014). A major interpretation on the above statistics is there are 6 people per house. This is considered high for typical house in Malaysia with 2 to 3 bedrooms. The housing prices have increased by a record margin. For instant, in year 2009 to 2014, the prices have increased by 12.3% annually all over the country (Khairie, 2013). Malaysia houses price on average cost much more than 3x annual median income, show in Table 1. In median income terms, Malaysia houses are more expensive than house in Ireland and even Singapore. (Khazanah Research Institute, 2014).

Table 1: Housing Prices as a Multiple of Annual Median Income

Country	Multiple
Malaysia	5.5x
Singapore	5.1x
US	3.5x
UK	4.7x
Ireland	2.8x
Hong Kong	14.9x

(Source: Khazanah Research Institute, 2014)

Malaysia mean monthly household income in 2012 was RM 5,000, but median household income was only RM 3,626 (Department of Statistic, 2013). See Table 2 for household's income in Malaysia

2012. In medium income term, affordable house are housing that cost around 3 times of 12 months medium income, which is [3 x 12 x RM3, 626 = RM130, 536] RM130, 536 per house.

Table 2: Household's Income in Malaysia 2012

Households Income (RM)	Percentage (%)
< RM999	5%
RM 1,000 - RM 1,999	17.6%
RM 2,000 - RM 2,999	15.9%
RM 3,000 - RM 3,999	16.7%
RM 4,000 - RM 4,999	11.1%
RM 5,000 - RM 5,999	7.8%
RM 6,000 - RM 6,999	6.0%
RM 7,000 - RM 7,999	4.5%
RM 8,000 - RM 9,999	5.7%
> RM 10,000	9.7%

(Source: Department of Statistic, 2013)

From table 2, it is obvious there are about 60% household that cannot afford to own a house, because their salary is below the median income. However, the government attempt to address housing shortages in various ways. For instance, the My First Home Loan Scheme was introduced. According to this

scheme, household who earn less than RM 5,000 per month or below, are eligible to apply for a 100% bank loan for a house instead of paying the 10% down payment (Shukry, 2013). However, the scheme is inconsistent and requires the eligible ones to pay RM 2,000 for a house with an RM 400,000 price tag

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(Shukry, 2013). The house prices are rising exponentially and it will become more difficult for the middle and lower income class of Malaysian to afford a home in the future. There is a 40% difference between the demand for affordable housing and its supply in the country at the moment (Khairie, 2013). 80% Malaysians earn less than RM 6,900 per month and cannot afford houses priced at higher than RM 300,000 (Khairie, 2013).There is only 31.7% of the total number of housing units constructed in the year 2012 had a price tag below RM 250,000 (NAPIC, 2013). Those in middle group class are finding it very difficult to own a unit of house, thereby increasing the need for affordable housing.

Method of Data Collection:

The objective of this study is achieved through the Analytic Hierarchy Process (AHP). The AHP was due to Thomas Saaty in the 1970 because of the scarcity and resources allocations. It is powerful tools for prioritising criteria and making information decisions on the selections of alternatives. The Analytic Hierarchy Process (AHP) is due to Saaty (1980). The technique is suitable to different types of criteria, i.e. qualitative, quantitative and intuitive criteria comprehensively. The AHP technique is based on three principles: hierarchical structuring, weighting, logical consistency. It uses the pairwise comparison method to rank order alternatives of a problem that are formulated and solved in hierarchical structure. It decomposes complex problems into small sizes for meaningful comparison by taking into the shortcomings in human thinking. The AHP model deals with prioritising of decision making by reducing complex decisions to a series of pairwise comparisons and synthesizing the results. The consistency test embedded in the AHP allows it to adequately correct the lack of transitivity in the choices that respondents made (Olanrewaju and AbdulLateef, 2015). The consistency ratio, CR has set by Saaty (1994) has the acceptable metrics:

1. The CR value is 0.05 for a 3 by 3 matrix;
2. 0.08 for a 4 by 4 matrix,
3. For larger matrices. 10

The AHP serves two major purposes, namely to prioritise criteria and facilitate selection between various alternatives. However, for the purpose of this study, the techniques it selected to prioritise criteria contributing to the economies of affordable housing. The survey was based on conveniences sampling. In this method respondents were selected based on availabilities, accessibilities and experiences. The questionnaire was designed in accordance with the AHP requirements, the Saaty's preference scale, see Table 3. However, the questionnaire involves both closed ended and open ended questions, as to carter for information on the **respondents' profiles. All altogether 5 respondents** were involved. The respondents involve 2 developers, 2 contractors and one consultant. In this study, the five determinants for housing economics were selected based on pilot survey and literature review. In Figure 1 are the major determinants and their associated sub-criteria. In other words, the AHP technique was used to calculate the relative weights of these criteria and sub criteria. The criteria and sub-criteria were selected to meet the AHP requirements (Cheng and Li, 2001):

1. The element at level are related to the elements adjacent to it
2. There is not relationship between the elements of different groups at the same level.

AHP is a decision making model that aids in making informed decision in complex world. It is a involves three basics parts process which includes identifying and organizing decision objectives, criteria, constraints and alternatives into a hierarchy; evaluating pairwise comparisons between the elements at each level of the hierarchy; and the synthesis using the solutions algorithm of the results of the pairwise comparisons over all the levels. This study is only concerns with developing a weightage to cost criteria. In other words, the design objective is to evaluate the costs distribution for the housing cost and five major criteria identify. Each of five criteria has four or five sub-criteria.

Table 3: Scale of Relative Importance

Intensity of Importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
3	Weak importance of one over another	Experience and judgment strongly favor one activity over another
5	Essential or strong importance	Experience and judgment strongly favor one activity over another
7	Demonstrated importance	An activity is strongly favored and its dominance demonstrated in practice
9	Absolute importance	The evidence favoring one activity over another is of the highest possible order of affirmation
2, 4, 6, 8	Intermediate values between the two adjacent judgments	
Reciprocals of above nonzero	If activity i has one of the above nonzero numbers assigned to it when compared with activity j, then j has the reciprocal value when compared with i	

(Source: Saaty, 1980)

Fig. 1: The AHP model for the Study

Findings And Discussion:
Respondents' Profiles:

Altogether, five respondents participated in the survey. Two were from the developer's organisations and two from contracting firms and one consultant. One of the respondents from organisations has about ten years working experience while the other has more than 20 years' experience. The two are into the development of high rise buildings and both were from Penang. In terms of working experience, the two from the contracting organisation are very similar from those from the developer's organisations. However, one of them was from Perak while the other is from Kuala Lumpur. Both specialized in the construction of high rise buildings. The consultant is construction project manager and has more than 20 years' experience in the construction industry. His business operations are mainly in Penang and specialized in construction of high rise building. Therefore, on the basis of the

profiles, the respondents have good understanding of the housing sector in Malaysia consequently their opinions are valid and reliable.

Weighting the affordable housing cost:

The survey found that the five variables have major influence on the economies of affordable housing. However, while financing and profit margin occupy the largest portion of the cost, the cost of construction contributes the least, see Figure 2. The other three are cited in between. Specifically, the major cost determinant for the financing and profit margin is the contractor's profit contributing more than 50%. As part of the cost of land, location of the site was found to be the major determinant, with contributions of more than 50%. Besides the cost due to location cost of facilities also make significant contributions. Permit fees and cost due to stamp duties accounts for more than 60% of the compliance cost. The survey also found that cost of materials and components and labour's wages were the two major issues in construction costs. Transpiration cost is not making much meaningful contribution. With respect to the capital cost, the surveyed found that apart from the costs due to fixture and fittings, administrative cost, maintenance cost and consultancy fees are quite significant.

From the survey findings, it is evident that the both developer and government play vital roles in the determination of the cost of housing. However, contrary to expectation, construction cost is not the major important. It was not expected that the financing and profit margin will be the highest variable cost of affordable housing. Therefore this research confirmed the observations by the developers in Malaysia are responsible for the increasing in housing cost. At 21%, the profit margins for Malaysia property developers are high, almost 2x those of the US (12%), 1.2x those of the UK (17%) and higher than Thailand (14%), although Singapore has higher margins (25%) (Khazanah Research Institute, 2014). Specifically, profit margin, represents what percentage of sales are left over after all expenses are paid by the business. Profit as benefit that is gained when the amount of revenue gained from a business activity exceeds the margin cost of cost of production, is healthy for the growth of business, however, when it is in excess, is affect the business in the long run. Later the demand side and supply will not be able to match together. The housing industry may be responding the housing

price, but on long term possible effect is housing glut as the prospective home buyers might not be able to buy the homes of their. This will also affect many institutions if the prospective home buyers could not settle their mortgages. Therefore to propelled growth the housing industry, the developers should reduce the profit margin. But, to do this the government needs to set up some measures.

In between, the government needs to reduce the fees developers and contractors. From the survey, it is also evident from the survey that, the compliance cost is excessive. Basically the compliance costs are fees that the developers and contractors to governments. At the states levels, that amount varies often high. The costs are passed to the home buyers as the contractors / developers considered these as part of the input costs. Although there are cases of abuse, without significant reduction on these and close monitoring to avoid multiple charges, it is very likely that this make the housing cost to remain be high. The contractors' operation costs are also found to be making high contribution to the housing costs. These costs are the responsibility of the contractors, the government have not much significant only this. While these costs may not be adjustable; but with the help of proper management system, the developers and contractors could improve their operating costs. Contractors may choose to hire plants rather move from one state to their in case their works schedules are not in close proximity. Sound maintenance schedule for the plant and equipment provide alternative for saving cost. Lacks of proper maintenance of the equipment are cited and even sometime leading accidents. Recently, there is being frequent cases of dearth on construction sites.

Cost of materials and labour form the major variables contributing to the construction costs. But this bit surprising because the materials and components required for affordable housing could be sourced locally. However, may be government need to relax the import duties for certain construction materials. The contractors and material suppliers could form partnership (Black, et al., 2000). Utilities cost comprising cost of water, telephone electricity fees and others were cited to be major factors. The location of land is a very significant factor contributing to the cost land. Certainly there is close correlation between housing and it location. In real 'affordable housing' when sited in or close city areas they often beyond the means of those in low and middle income groups.
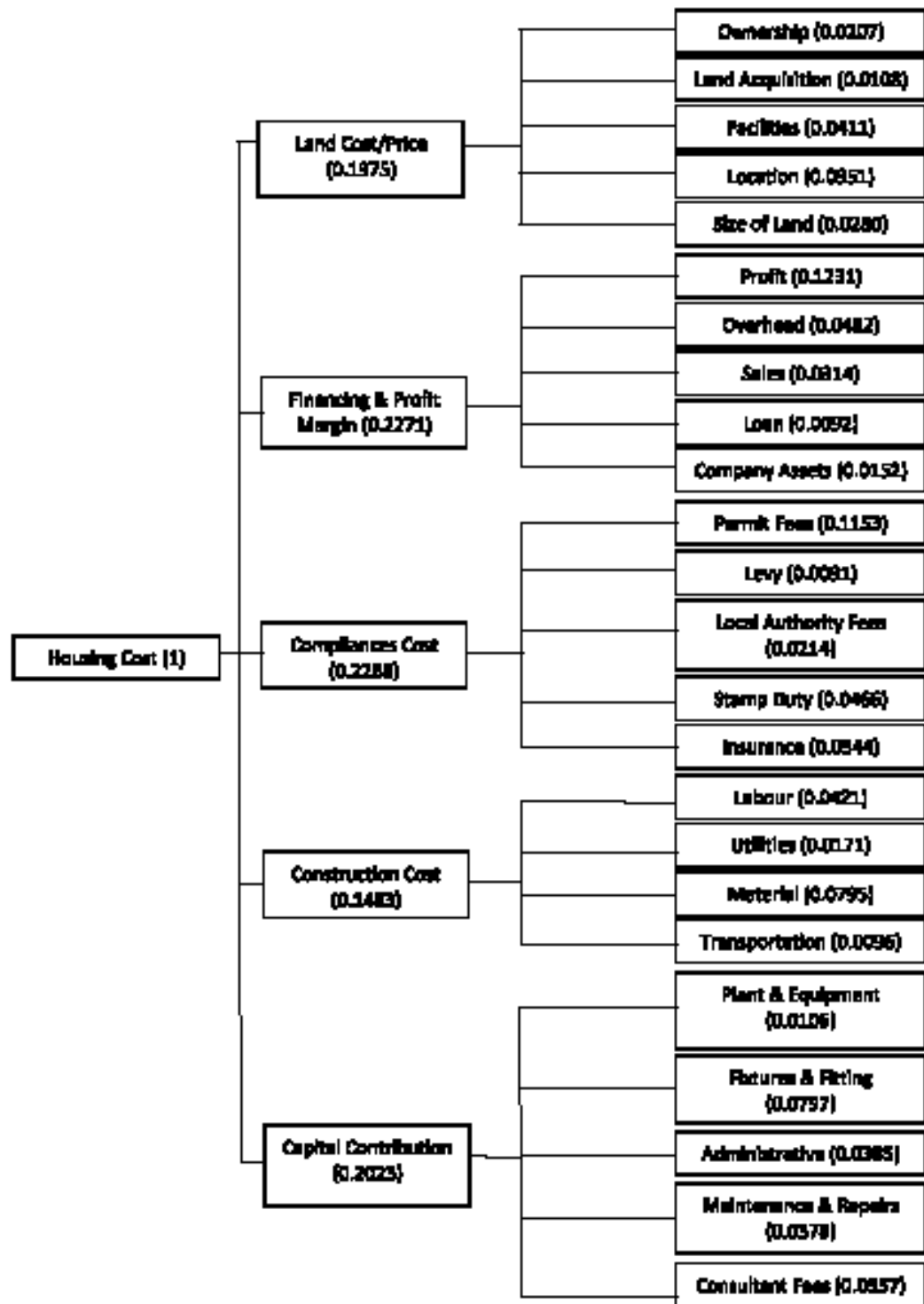
Fig. 2: Hierarchy models of affordable housing cost

However, with government intervention, this is possible by balancing integration and economic

growth. Those in the low and middle groups working in the major cities have discovered that transportation cost hugely contributed to dwindle in their salary.

Conclusion:

This research found that to improve cost of affordable housing, both the government and developers have major roles to play. Profit and national growth should be tie together with social integration. In anticipation of the main research, this proposal has outlined a plan to proceed with the main research project. The need to supply affordable housing cannot be overemphasized enough, as this is the only way that the available resources can be put to maximum application without compromising the benefits of all stakeholders. Therefore, organisations, including developers and government could use these criteria to predict the cost of affordable housing more accurately as compared to using the traditional rating method.

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A PROPOSAL FOR AFFORDABLE HOUSING SUPPLY IN MALAYSIA

ABSTRACT

Housing is a shelter for everyone all around the world. Housing forms the foremost important needs in the Maslow's Hierarchy Theory. Among the five level needs in Maslow's Hierarchy, housing is the lowest which is very important needs for human being. The provision of adequate housing is concern of government globally. In 21st century, there are many Malaysian households do not afford own their home in Malaysia. For that reason, this research present on a proposal for affordable housing supply in Malaysia. However, through extensive literature, this research revealed that affordable housing in Malaysia is not affordable and Malaysia houses are more expensive than house in Ireland and even Singapore. The purpose of this research is to formulate policies and procedures to deliver affordable housing. The research will be useful to the policy makers, developers, manufacturers, suppliers and buildings users.

Keywords: affordable housing, housing scheme, housing shortage, housing policies

INTRODUCTION

The concept of affordable housing is used to solve the low and medium income people on housing problems around the world. Affordability is the ability of a person in providing something, which is usually referred to his ability in financial terms. Housing affordability has been referred to by a number of researchers in many different ways. To Anirban et.al, (2006) house affordability is a condition when people have the potential to save certain portion of their income to buy a house, as well as to pay other expenditures in their working period. Housing affordability is measured by household income and expenditures. Thus, if a buyer allocates 30 percent of his or her gross monthly household income for buying a house, it can be said that he affords it. Bujang, (2006) and United States Department of Housing and Urban Development (HUD, 2003) noted that, families who pay more than 30 percent of their income for housing are considered cost-burdened and may have difficulty to meet basic necessities such as food, clothing, transportation, and medical care. There are several positive impacts on affordable housing which are economic impacts and social impacts. Advantages and costs production, business and funds result from housing projects are considered as economic impacts. While, social impacts is reaction on lifestyle (Lubell et al, 2007). This paper present the research proposal consists of affordable housing delivery.

LITERATURE REVIEW

Population in Malaysia are highly increasing, in year 2010, the population is only 28.59 million, while in year 2015, the population increase to 31.10 million (Department of Statistics, 2015). In year 2020, Malaysia aims to be a fully developed country by the year 2020. The estimated population in year 2020 is 32.4 million, comprising 16.6 million male and 15.8 million female (Department of Statistics, 2015). In the process to become a fully developed country, Malaysia economic has growth in demand of housing; it currently causes the housing shortage in Malaysia. The residential unit in year 2013 is 4,831,791 units (NAPIC, 2014). A major interpretation on the above statistics is there are 6 people per house. This is considered high for typical house in Malaysia with 2 to 3 bedrooms. The housing prices have increased by a record margin. For instant, in year 2009 to 2014, the prices have increased by 12.3% annually all over the country (Khairie, 2013). Malaysia houses price on average cost much more than 3x annual median income, show in Table 1. In median income terms, Malaysia houses are more expensive than house in Ireland and even Singapore. At 21%, the profit margins of Malaysia property developers are high, almost 2x those of the US (12%), 1.2x those of the UK (17%) and higher than Thailand (14%), although Singapore has higher margins (25%) (Khazanah Research Institute, 2014).

Table 1 Housing Prices as a Multiple of Annual Median Income

Country	Multiple
Malaysia	5.5x
Singapore	5.1x
US	3.5x
UK	4.7x
Ireland	2.8x
Hong Kong	14.9x

(Source: Khazanah Research Institute, 2014)

Malaysia mean monthly household income has increased from RM 5,000 in 2012 to RM 6,141 in 2014, this show an increase of 10.30 percent per annum. While median monthly household income in 2014 increased to RM 4,585 rather than RM 3,626 in 2012 which is growing at the rate of 11.7 percent annually (Department of Statistic, 2015). In medium income term, affordable house are housing that cost around 3 times of 12 months medium income, which is [3 x 12 x RM 4,585= RM 165, 060] RM 165, 060 per house.

Table 2 Households Income 2012

Households Income (RM)	Percentage (%)
< RM999	5%
RM 1,000 - RM 1,999	17.6%
RM 2,000 - RM 2,999	15.9%
RM 3,000 - RM 3,999	16.7%
RM 4,000 - RM 4,999	11.1%
RM 5,000 - RM 5,999	7.8%
RM 6,000 - RM 6,999	6.0%
RM 7,000 - RM 7,999	4.5%
RM 8,000 - RM 9,999	5.7%
> RM 10,000	9.7%

(Source: Department of Statistic, 2013)

According to table 2, it is obvious there are about 60% household cannot afford to own a house, because their salary is below than median which is below than RM 3,626 in year 2012, due to households income 2014 do not release, so this research will be using households income 2012. Based on table 2, there are about 70% household cannot afford to own a house as their salary is below median which is below RM 4,585 in year 2014.

Malaysia citizen are facing housing loan issue. Dealing with extreme housing price, low-income increment, high interest rate, and price inflation of living goods are the main causes of the housing loan issue. According to Goh that high value of house price had actually, make buyers delayed to own a house, or forced them to consider other than their preference, or suffering with high housing loan (Goh, 2012). In the Malaysia Property News (2010), the property bubble in Malaysia is formed when there is excessive bank-lending and low borrowing cost leading to investment as well as plenty of speculation. Property prices will increase until they reach unsustainable levels relative to incomes and other economic elements. Banks will be short on capital, while cases of non-performing loans start to show up. When banks start cutting back credit, it will in turn affect the economy, as the move will affect the price of property as well (Malaysia Property News, 2010).

House prices are rising exponentially and it will become more difficult for the middle and lower income class of Malaysian to afford a home in the future. There is a 40% difference between the demand for affordable housing and its supply in the country at the moment (Khairie, 2013). 80% Malaysians earn less than RM 6,900 per month and cannot afford houses priced at higher than RM 300,000 (Khairie, 2013). There is only 31.7% of the total number of housing units constructed in the year 2012 had a price tag below RM 250,000 (NAPIC, 2014). The rising income of the middle class is finding it very difficult to own a unit of house, so the need for affordable housing becomes more important.

The government attempt to address housing shortages in various ways. For instance, the 50% stamp duty exemption on instruments of transfer and loan agreements has been extended until 31 December 2016 with an increase of the limit from RM 400,000 to RM 500,000. Besides, to address the issue of home ownership at affordable prices, the Government will continue to implement various projects and programmers (The Star, 2014). Table 3 contain summary of affordable housing scheme in Malaysia.

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Table 3 Summary of Affordable Housing Scheme in Malaysia

Affordable Housing Schemes	Description
PR1MA	Perumahan Rakyat 1Malaysia (PR1MA) was launched in 2011 to provide affordable homes for middle-income households in key urban centres. Perbadanan PR1MA Malaysia was established under the PR1MA Act 2012 to plan, develop, construct and maintain high-quality housing for the PR1MA programme. Perbadanan PR1MA works with private sector developers to build PR1MA homes.
PPA1M	Perumahan Penjawat Awam 1Malaysia (PPA1M) is a government-led initiave to help civil servants, especially low and middle income earners, to affordably own a comfortable house. Perbadanan Putrajaya acts as the coordinator and developer of PPA1M for the Putrajaya region, PPA1M's first project since it was launched in 2013.
RMM Pulau Pinang	Penang Affordable Housing Scheme (RMM) is a Penang State Government initiative to provide quality housing at affordable prices for Penang residents. Through public private partnerships in construction, the State Government aims to provide a range of affordable homes in various strategic locations across Penang. RMM provides a range of low, low-medium and affordable housing units under the scheme.
RMM SPNB	Syarikat Perumahan Negara Berhad (SPNB), a wholly owned subsidiary of the Ministry Of Finance Incorporated (MoF Inc.), is responsible in implementing the Rumah Mampu Milik (RMM) Programme, which aims to ensure those in low income groups are able to affordably own comfortable homes. SPNB offers and has successfully completed several low cost, low medium cost and medium cost housing projects through the RMM programme.
RUMAWIP	The Ministry of Federal Territories launched its affordable housing initiative, Rumah Wilayah Persekutuan (RUMAWIP) in April 2013 with the objective of providing housing to the residents of the Federal Territories. The construction of the affordable housing units is done through public-private partnerships with private sector construction firms.
RMM Sarawak	**Sarawak's Housing Development Corporation (HDC) leads the RMM scheme in** Sarawak with the aim to develop low and medium cost housing units for sale to low income earners in the state. Between 1973 and 2014, HDC has completed 31,237 units of Affordable Housing (Low Cost) throughout Sarawak.
Rumah Selangorku	The Selangor State Government introduced its affordable housing policy, Rumah Selangorku, in January 2014 to ensure Selangor residents are able to own a decent, comfortable and secure home to live in. Led by Lembaga Perumahan dan Hartanah Selangor (LPHS), low, low-medium, medium and affordable housing **units/projects in Selangor are rebranded as 'Rumah Selangorku'. Houses** under the scheme are built by private sector firms.
MyHOME	Under the Urban Wellbeing, Housing and Local Government Ministry, MyHOME was launched in April 2014 to help low income households own a house at an affordable price. Under the scheme, qualified private sector developers will receive an upfront subsidy of RM 30, 000 per affordable home sold.
DPR Johor	The Johor State Government launched the Johor Housing Policy (DPR Johor) in April 2012 to ensure property developers build and offer affordable housing options within property development projects in Johor. Under the housing policy, developers need to build affordable houses amounting up to 40% of the entire development project.

Table 3 Summary of Affordable Housing Scheme in Malaysia (Continue)

My First Home Scheme	My First Home Scheme (SRP) was first announced in the 2011 to assist young adults who have just joined the workforce to own their first home. The scheme allows young adults to obtain 100% financial institutions, enabling them to own their 1ˢᵗ home without the need to pay a 10% down payment. Under the scheme, the gross income limit is RM 5, 000 per month.
Housing Loan Schemes	Housing Loan Schemes (SPP) was approved by Malaysia Parliament on December 17, 1975 by amending the Second Schedule of the Financial Act 1957 (Amendment 1982). This scheme is admistered through a fund known as the Housing Loan Trust fund for low income group.
People's Housing Program	People's Housing Program (PPR) is the Government initiative to relocate squatters and meet the needs of low income groups for housing. Ministry of Urban Wellbeing, Housing and Local Government (KPKT) through the National Housing Department is the implementing agency for PPR Projects.
Transit House Program	Transit House Program (RT1M) is Ministry of Urban Wellbeing, Housing and Local Government (KPKT) to help who just married a living place in urban area especially Kuala Lumpur. This program launched in the early 2014 for the household with low income to own their first house.
Youth Housing Scheme	Youth Housing Scheme (YHS) is a first-time home ownership scheme for married youth aged between 25 to 40 years with household income not exceeding RM 10,000 per month. This scheme is limited to 20,000 buyers only on the "first come first served" basis.

(Sources: Khazanah Research Institute, 2015; KPTP, 2015; SRP, 2013 & BSN, 2015)

According to the Table 3, PR1MA, PPA1M, RUMAWIP, MyHOME, My First Home Scheme, Housing Loan Schemes, People's Housing Program, Transit House Program and Youth Housing scheme are under Malaysia Government affordable housing program. Besides, RMM Pulau Pinang, RMM Sarawak, Rumah Selangorku and DPR Johor are the states affordable housing program. The criteria for states affordable housing program are only for the state resident or the housing market in the particular states. Affordable housing programs not only provide assistance to the bottom-40% of households, but the middle-40% as well; housing affordability is not only a lower-income challenge (Khazanah Research Institute, 2015).

The Tenth Malaysia Plan (10MP) includes establishing 78,000 affordable housing units, out of which 38,950 will be under the People's Housing Program and 39,050 units will be under the programs conducted by Ministry of Rural and Regional Development (The Economic Planning Unit Prime Minister's Department Putrajaya, 2010). Government has a lot to do when it comes to developing low cost and affordable housing for the people of Malaysia. Most importantly, in year 2014 Budget, government is providing subsidy of RM 30,000 per unit, which encourage developers to build more low-cost and medium-cost houses. Starting from year 2014, developers must build at least 20% low-cost houses and 20% medium-cost houses in a housing project. The houses are open to first-time buyers with a monthly household income of RM 3,000 for low-cost houses and a maximum of RM 6,000 for medium-cost houses. In order to increase government engage on the provision of affordable housing delivery, the national housing policy was introduced.

In the Eleventh Malaysia Plan (11MP) outlines a target of 653,000 units of affordable housing to be built during the Plan period (2016-2020), or an average of 130,000 houses built a year (The Economic Planning Unit Prime Minister's Department Putrajaya, 2015). The government continue to play a major role in meeting the housing needs for

targeted groups in urban and rural areas by continuing successful, existing programs in 10MP. Besides, to improve the planning and development of affordable housing, an integrated database accessible to all relevant stakeholders will be established to ensure housing supply matches demand according to locality, price, and target groups. Land bank will be established for the development of affordable housing, particularly in urban areas. Collaboration between National Housing Department and state Islamic religious councils could be leveraged to unlock potential waqf and baitulmal land. The Government also encourage all new affordable housing developments to adopt sustainable practices, and provide livable and environment-friendly facilities and infrastructure for the resident. Public housing rental rates will be reviewed to ensure that sufficient funds are available to cover the cost of management and regular standard maintenance of public housing. Community involvement will be promoted to highlight collaborative responsibility in maintaining housing communities.

Ensuring compliance of the housing service delivery System, improving the capability of the people, the National Housing Policy is committed towards ensuring access to quality and affordable housing to meet the needs of a growing population by matching demand and supply, promoting an efficient and sustainable housing industry, as well as providing efficient public utilities and services and a clean environment (NHP, 2010). The objectives for National Housing Policy (NHP) are providing adequate and quality housing with comprehensive facilities and a conductive environment, enhancing the capability and accessibility of the people to own or rent houses and setting future direction to ensure the sustainability of the housing sector. In order to achieve the objectives, they are based on six (6) thrusts which is provision of adequate housing based on the specific needs of target groups, improving the quality and productivity of housing development, increasing the effectiveness of implementation and to own and rent house, sustainability of the housing sector and enhancing the level of social amenities, basic services and livable environment.

PROBLEM DESCRIPTION

Project financing can come from a public body client, private client or a mixture of both public and private funding. Every funding has their pro and cons such as interest rate of the loan. There is no indication of which method of finance is the most useful to the developer in Malaysia. The increase of price of house in Malaysia is due to shortage of construction material which leads to a situation where developers have to search for particulars materials in order to continue the construction progress. Home-buyers seek adequate housing that does not take up an undue portion of household income. They seek good location and amenities, secure tenure, access to housing finance and a degree of mobility and choice. There is a need to know what is the major user perception on affordable housing.

THE AIM OF THE RESEARCH

The aim of the research on this paper is the guideline to deliver affordable housing.

THE OBJECTIVES OF THE RESEARCH
To achieve the above aim, the following objectives have been set:
1. Identify appropriated method of finance for affordable housing
2. Identity major construction materials for affordable housing
3. Investigate user perception on affordable house

THE RESEARCH QUESTIONS
1. Why Malaysia affordable in Malaysia is not 'affordable'?
2. What is the affordable price?

PROPOSED METHODOLOGY
The research will collect primary data collections through questionnaire. The methodology for this research involved data sources that cross examine the validity and reliability. However, before the primary data collection, pilot study will be conducted to test the wordings, ambiguities and ease of understanding of the questionnaire. The first objective of this research is to study appropriated method of finance for affordable housing. To achieve first objective, survey will carry out to professional such as higher level position of the developer will conduct in Northern and Central Region in Malaysia. The results will be analyzed by using Expert Choice software to develop a mathematical model. This will test for Analytic Hierarchy Process (AHP). The need arise in order to develop housing delivery index in an effort to improve housing delivery. These objectives develop quantitative index for affordable housing economics to enable suitable and accuracy of decision making process.

The second objective is to identity major construction materials for affordable housing. To achieve second objective, survey will carry out to the construction material supplier. Housing requirement for affordable will be based on the example of the plan and to analysis the material whether available in Malaysia market and the material price. In order to achieve the above said objective, the proposed method is to list down the criteria of basic housing requirement in terms of occupant's life quality and the life cycle of the affordable house. The consisted methods in basic housing requirement are the layout of house. This research will review on serval type of affordable housing plans. Base on the plans come out with the list of the material use and the price of the particular material, to see whether construction material are the causes increasing the housing price.

The third objective is to study user perception on affordable house. Survey will be carry out for this objective by using questionnaires, distributed to home buyer in the district of Northern Region in Malaysia. The results will analyze by using Statistical Package for the Social Sciences (SPSS) will test on Cross tabulation, Frequencies, Explore, Descriptive ratio statistic, Means, T-Test, ANOVA, Correlation, Nonparametric tests, Linear regression, Factor analysis, cluster analysis and Discriminant. This objective develops the home buyer perception towards affordable housing and their understanding of the important factor causes increasing of Malaysia housing price. This objective also aims to aid buyers in regards of understanding the important criteria such as the buyer demands.

This research will be useful to the policy makers, developers, manufacturers, suppliers and buildings users.

This research is limited in scope to home buyer and focus mainly on those located within the Northern and Central Region in Malaysia. Northern and Central Region includes Penang, Kuala Lumpur, Kedah, Perak and etc. Penang and Kuala Lumpur are the urban cities in Malaysia, it will useful for the research especially the youth in these both cities. This research will focus on home buyer especially first home buyer, to get their perception towards affordable housing and their understanding of the important factor causes increasing of Malaysia housing price. See Figure 1 for Research Flow Chart.

CONCLUSIONS

This research will produce a prototypes decision making framework for delivering affordable housing. Therefore, the findings will facilitate decision making housing delivery. In anticipation of the research, this proposal has outlined a plan to proceed with the overall research project. The need to supply affordable housing cannot be overemphasized enough, as this is the only way that the available resources can be put to maximum application without compromising the benefits of all stakeholders.

Proposed Flow Chart
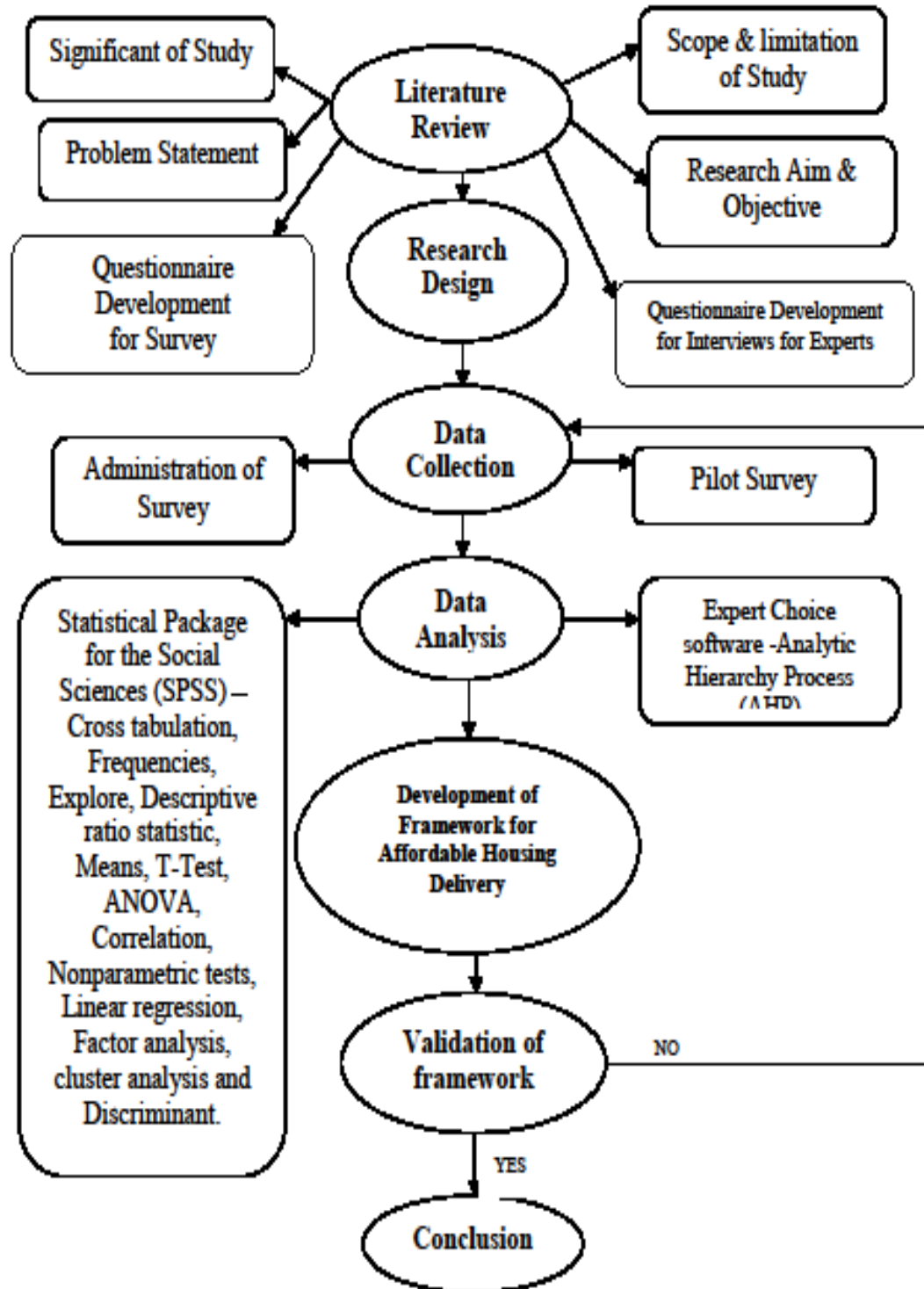
Figure 1 Research Flow Chart

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RESEARCH ARTICLExxxxxxxxxxxxxxxxxx

Factors affecting housing prices in Malaysia: analysis of the supply side

AbdulLateef Olanrewaju*[1], Xin Ying Lim[1], Seong Yeow Tan[1], Jia En Lee[1], Hamimah Adnan[2],

[1]Faculty of Engineering and Green Technology, Universiti Tunku Abdul Rahman, 31900Kampar,
[2]Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA, 40450 Shah Alam, Malaysia

Housing is a major decision that homebuyers will make because expenditure on homeownership has consequences on the buyer's quality of life. The prices of housing also influence developers' revenues and profit margins. Developers' produces houses to make profits, however, with the increase in housing prices, homeownership rate and developers' profit performance will be affected. Therefore, this paper reports a study that examined the reasons why housing prices are high and increasing in spite of the government's 'cooling' measures. Through a cross-sectional survey questionnaire, comprising 24 causes and 115 members of the housing developers' designers team, 13 causes were found to be the major influential factors for the increase in housing prices. The industry participants measured the five most influential factors causing the increase in housing prices as the shortage of materials, quality of materials, strategic factors, housing location and availability of transportation system. The results will be useful to developers, homebuyers and policymakers towards reducing housing prices.

Keywords: Design Deficiencies, New Buildings, Maintenance, Obsolescence, Housing

1. INTRODUCTION

The demand for housing in Malaysia will increase because there is a positive correlation between the performance of housing with occupants' productivity, safety, well-being and satisfaction. As Olanrewaju et al [1] explained if the housing criteria in terms of location and cost lead to users satisfaction, then the government and public will spend less on the provision of healthcare facilities, recreations, crime preventions and pollutions, while productivity and prosperity increase. The ability to own a home is seen as an investment in most part of the world. People spend more than 50% of their productive time in their house. Expenditures on housing is high and for those who buy/build their houses, the property represent the single most expensive investment they make and for those that rent, the rental is often their single highest monthly or annual expenditure. Housing serves as both capital and consumption goods. Housing construction contributes significantly to the construction GDP in most countries. However, because demand and supply of the housing market is not perfect, the decisions of homebuyers and the developers have strong impacts on the housing supply.

*Email Address: abdullateefolanrewaju@ymail.com

In most part of the world including the UK, the US, Japan, Hong Kong, Malaysia, Singapore, Australia, Ireland, and New Zealand, housing [6], Nigeria, Indonesia and South Africa, housing is not affordable. In most countries, households spent more than 30% of their disposable income to own/rent and operate a house or the price-to-income ratio is more than 3.0. Based on the Demographia, a ratio of more than 3.0 implies unaffordability of housing. However, governments across the world have introduced measures and policies to increase the quality and quantity of housing supply in order to increase homeownership and increase the quality of life. In Malaysia, while homeowners' rate is decreasingly at 1% annually, the unsold residential property and overhangs are high and increasing. To illustrate, the volume of transaction are 272,669; 246,225; 247,251 and 235,967for 2012 to 2015 [2]. The vacancy rate has increased from 6% in 2010 to more than 10% in 2015. MIER's Residential Property Survey Report conducted in 4Q 2015 found that 70% of the developers reported poor sales [3] and many are homeless.

Academic literature leads to the conclusion that the major reason for this is because Malaysian housing prices are high and it outpaced the increase in incomes and inflation [3, 4, 5]. Various studies revealed that homings in Malaysia are 'severely unaffordable' or buyers are 'cost overburden' [1, 4, 5, 6]. Homings are severely unaffordable if the housing price to household income ratio exceeds 5.1 [6]. In a study conducted by Olanrewaju et al. [7], they

reported that most households in Malaysia spent more than 30% of income to own/rent and operate their houses. In terms of index, the house prices have increased by 1.86 from 2009 to 2016 while that of the high rise is more severe with increase of 2.12 within the same period [8]. Therefore, there is the need to provide an answer to why housing prices are increasing in Malaysia. Multiple reasons could be responsible for the increase in the housing prices. Part of the problems could be accountable to developers, contractors, government policies, and third-party agencies. In this study, the causes of the increase are examined from the supply side perspectives. Empirical research that specifically addressed itself to causes of increase in housing prices from the experience of the providers (i.e. developers, design team, construction team and government) is lacking. It is important to investigate housing prices from the experience of the housing providers because housing is conceptualized, designed, constructed and sometimes operated by them, they know the operation of the housing market, and how they relate to government, third-party agencies and the homebuyers.

2. CONCEPTUAL JUSTIFICATIONS

Housing is required to provide safety, security, protection, comfort, experience, satisfaction, and convenient to the home occupants. However, Malaysia is facing housing shortage problems, with a population of 31 million people [9] and 7.2 million housing stocks [10]. There are fewer than 250 housing units per 1000 population. In order to increase the housing stocks and homeowners, the government have introduced many measures including schemes, programmes, and policies. These measures include MyHome, Perumahan Rakyat 1Malaysia (PR1MA), Rumah Mesra Rakyat (RMR1M), Program Rumah Mampu Milik (RMM), Program Penyelenggaraan 1Malaysia (TP1M), MyDeposit Scheme, Housing Loan Scheme, People's Housing Programme, Rumah Transit/ transit house programme and MyBeautiful New Home. Similarly, subsidies and tax reliefs have been provided to homebuyers, developers and contractors. The government has relaxed its regulation on the EPF (Employee Prudential Fund) to enable contributors to use part of the savings as down payment for their housing loan. Developers offer discounts and split payments to home buyers. The developers (i.e. REHDA) also offer 'bridging' loan to home buyers because of the reduction in loan approval rate. The bureaucracies on land allocations are easing and the government has exempted construction property from the GST (Goods and Services Tax) and the restriction on the employment of foreign labour on contractors has been lifted. Meanwhile the housing turnover, neighbourhood instability, unsold and overhangs and dissatisfactions are high and increasing [1]. The size of unsold property stood at 41% in 2015 and more than 22% of the housing property was overhang in 2015 [11]. Table 1 contained the price indices for the last eight years, where it can be seen that housing prices are increasing.

While incomes have increased by about 101% since 1999 housing price has increased by more than 200% within the same periods (Table 2). While the private final

consumption stood at RM556.6 billion in 2015, housing operations constitute the largest part of the private consumptions [12]. The implication of this is that for Malaysians to have a decent home, they will have to cut down expenditure on foods, health, social life, entertainments, and education. While the consumer index for all major items dropped from 3.2 in 2011 to 2.1 in 2015, that of housing and its operations increase from 1.8 to 2.5 within the same period.

Table 1.The Malaysian Average House Price by House Type, 2009-2016

Year	All house	Terraced	High rise	Detached	Semi detached
2009	204,470	176,412	151,863	364,424	354,540
2010	213,678	189,905	172,651	382,512	374,697
2011	239,295	207,702	192,852	402,124	417,563
2012	271,384	234,934	223,735	454,186	465,612
2013	301,564	256,910	254,115	516,750	522,062
2014	330,428	284,136	277,729	563,869	354,402
2015	354,741	305,826	289,182	601,783	591,579
2016	379,843	326,445	326,204	642,775	619,767

[8]

Table 2 Annual House Price Index and house price 1999-2014

Year	Index (2000=100)	1-Yr % Change	Household income
2000	100	-	-
2001	101.1	6	-
2002	103.6	1.1	2,049
2003	107.7	2.5	-
2004	112.9	4	2,211
2005	115.6	4.8	-
2006	117.8	2.4	-
2007	124	1.9	2,552
2008	129.8	5.3	
2009	131.8	4.7	**2,841**
2010	140.7	1.5	
2011	154.6	6.7	
2012	172.8	9.9	**3,626**
2013	192.9	11.8	
2014	213.6	11.6	4,585
2015	236.2	7.3	

[8,13]

Thus, the policy question is what is the cause of the increase in the price of housing? The increase in housing is leaving many homeless and many are living in deplorable conditions. Although the increase in the housing prices can be examined from multiple stakeholders, this current study

focused on the supply side including the contractors, developers, government agencies and the design teams. Increase in housing price would affect government policies, citizens' productivity and well-being. It would affect developers/contractors profit margins and revenues. Collectively academic literature suggests housing prices could increase because of many factors including, materials, location, interest rate, neighbourhood, social capital, lack of recreational facilities, transportation [1, 7, 14, 15, 17]. Though many studies have been conducted on housing prices, empirical studies on the causes based on developers/contractors experience are nascent or inconclusive.

3. OUTLINE OF THE RESEARCH METHOD

The survey was conducted in two phases through hand delivery and an online survey. The first phase was administered to the respondents that attended the ARCHIDEX (International Architecture, Interior Design & Building Exhibition 2016) in the Kuala Lumpur Convention Centre based on convenience sampling. ARCHIDEX is held annually and attended mostly by architects and other stakeholders in the construction sectors (i.e. engineers, quantity surveyors, developers, contractors) in Malaysia and around the South East Asian countries. The ARCHIDEX 2016 was held on 20 July 2016 to 23 July 2016 and attended by more than 3000 delegates and exhibitors. This survey was conducted on 23rd (Saturday) July 2016. 96 completed survey forms were returned. The second phase was conducted through online Google survey form from November 2017 to December 2017. Respondents from the online survey were recommended to help forward the forms to their colleagues that are competent to provide valid responses. By the cut-off date, which was four weeks after the online survey was first launched 19 valid forms were returned. The factors leading to increasing in housing prices from literature [1, 7, 14, 15, 17,18, 19] and the authors' experiences were included in the survey form.

4. RESULTS AND DISCUSSION

4.1 Respondent's Profiles.

Altogether 115 valid survey forms were received and used for this study. Some 84% of the respondents obtained either BSc or MSc. In terms of their positions, most (36%) of the respondents are Architects. The percentage of Chief Executive Officers was 9% and that of directors and managers are 12%. In terms of professional background, the majority (60%) are architects followed by the engineers (12.2%). Quantity surveyors were only 5.2%. Most of the respondents worked for private organisations and about 60% have more than 5 year working experience (Table 3). Private firm implies (i.e. architectural, engineering, quantity surveying consulting firm) consulting companies. About 10% specifically worked for developers. 55% of the respondents were involved in affordable housing design and construction. Almost all the respondents have memberships of Board of Architect Malaysia, Board of Surveyor Malaysia or REHDA.

Table 3 Cross-tabulation between working experience and organisation

Experience / Organisation	Less than 5 years	5 - 10 years	10 - 15 years	15 - 20 years	More than 20 years
Government	3	1	0	0	0
Private Firm	38	14	5	6	17
Contractor	2	0	1	0	0
Developer	3	4	2	1	2
Supplier	0	2	5	2	0
Consultancy Firm	3	1	0	1	2
Total	49	22	13	10	21

4.2 Analysing the major causes of increase in housing prices.

In order to test the measures of goodness of the factors causing the increase in housing prices, Cronbach's alpha reliability and validity tests were performed. The reliability and validity tests indicated that the factors were suitable for the aim of this research (Table 4). To further confirm the strength of the data, Bartlett's test was conducted, the results signified a lack of multicollinearity among the factors and that the respondents were drawn from those with similar experiences (χ^2 (210) = 1423.511, p<0.001). The KMO is 0.720 and the R-matrix is 1.323E-006. The R-matrix signify a lack of multicollinearity, hence adequacies of the data are justified. One sample t-test was computed to determine the hypothesis that each of the factors will cause an increase in housing prices. For this reason, the null hypothesis was that the factor will not cause increased in housing price (H_0: $U=U_0$) and the research hypothesis was that the factors will cause an increase in housing price (Hr: $U>U_0$). U_0 is the population mean. The comparison standard mean or critical level off point was set at 1.5. Table 5 contains the results of the t-test, where it can be found that (i.e. Pr>|t|) of each of the causes (H_r: $U>U_0$) were significant. The small standard errors, being nearer to zero suggests that the measurements of the respondents with respect to the factors are representative. All the factors are statically significant. Therefore, all the factors are adequate and suitable to be included in the survey to achieve the aim of the research.

Further discussion on the profiles of the respondents will not be discussed and only 19 main factors leading to the increase in housing price will be briefly discussed after general discussions of the results are provided. Considering the relationship between the mean and standard deviation, the results are interpreted to mean that more than 70% of the respondents measured that the factors would increase prices of houses. In fact, the percentage of the respondents that disagreed or strong disagreed is 27.52. Exactly, 42.35% agreed and strongly agreed to the ratings. 32.19% slightly agreed. It is also obvious that 13 of the factors are the most influential for estimating housing prices. Location was considered as the factor that has the highest influence on the housing price according to the entire respondents. 88% of the respondents measured that the housing location has the highest impact on housing price. This result is expected

because the price of lands and the associated costs related to land are varied extensively. Lands in the cities are very expensive compared to lands outside the cities. Regulations on lands and construction in the cities are also very strict, especially for affordable housing. It is also not surprising that the respondents rated the size of the house as the second most influential factor for housing price. This is because costs of construction are actually determined by the size of the house. For instance, in Malaysia, housing price is priced at RM1, 200/m² in Kuala Lumpur. It is interesting to found that innovation and skills are considered as the next most influencing factor on housing price. This is not expected, however, construction costs are significantly influenced by the level of technology employed by the developers and construction on site. For instance, consultants' fees, claims and delay can also be reduced by using software like BIM.

Table 4 Distribution of Ranking of factors leading to housing price

Cause	Strongly Agree	Agree	Slightly Agree	Disagree	Strongly Disagree	Reliability	Validity	Std. Deviation	Causal Index
Location – urban/rural	18	83	12	2	0	0.809	0.754	0.577	1.983
Size of the house	10	56	48	1	0	0.809	0.728	0.649	2.348
Innovation and skills	11	61	35	7	1	0.813	0.798	0.774	2.357
Developers' profit margin	12	63	28	10	2	0.814	0.793	0.852	2.365
Strategic factors	2	63	46	4	0	0.807	0.604	0.596	2.452
Shortage of material	7	66	24	16	2	0.813	0.730	0.872	2.478
Rising labour costs	14	40	24	37	0	0.791	0.871	1.046	2.730
Economic uncertainty and financial risks	13	40	27	35	0	0.794	0.884	1.020	2.730
Planning restriction on the use of land	6	24	79	5	1	0.802	0.758	0.660	2.748
Quality of material & component use	6	30	65	13	1	0.806	0.682	0.753	2.765
Leasehold / freehold house	0	54	33	28	0	0.796	0.829	0.817	2.774
Climate changes	0	55	32	25	3	0.825	0.774	0.874	2.791
Interest rates	9	35	41	30	0	0.800	0.589	0.920	2.800
Households confidence on future price	12	38	23	42	0	0.807	0.623	1.045	2.826
Number of new houses being built	3	28	62	22	0	0.804	0.734	0.730	2.896
Geographical factors	3	41	32	39	0	0.798	0.847	0.896	2.930
Availability of facilities [eg: swimming pool, gym room, basketball field, playground & etc.)]	13	25	29	44	4	0.804	0.844	1.096	3.009
Layout of the house	3	29	29	26	28	0.792	0.883	1.184	3.409
Stamp duty	5	18	38	25	29	0.793	0.877	1.157	3.478
Currency exchange rate	8	24	23	24	36	0.791	0.741	1.314	3.487
Permit fees	3	17	38	28	29	0.793	0.891	1.102	3.548

The developer's profits were also rated as a major factor that would cause the price of a house to increase and reduce. This is interesting and the finding is not surprising because previous research has reported that the profit margin of Malaysian developers is very high at around 20% [14]. Strategic factor, marked by the proximity of the housing to schools, hospitals, place of works, and the market was also rated to be a major determinant of housing prices. This is expected because housings that are close to children's schools, markets, and workplaces are preferable to homebuyers, for strategic reasons including a reduction in the cost of transports because of accessibility, comfortability and conveniences reasons. Material cost constitutes about 60% of housing construction prices. Therefore, shortage and the associated increase in the cost of materials will have the significant impact on the housing price. Hence, it is not surprising that shortage or availability of materials was rated as an important factor in the estimation of housing price. It is interesting that the respondents also measured that the labour cost would increase housing price. This rating may be explained because the housing industry is labour intensive and most of the sites operatives are from the neighbouring countries. With government regulations on foreign labour, some projects are already been impacted. Economic uncertainty and financial risks were also measured as an influential contribution to housing price. The profit margins

of developers and contractors depend on the economic situations in a country especially due to imported goods and materials. Developers tend to reduce their investment in order to reduce their exposure to financial risks. Construction business involves large investments as result the developers also depend on loan from the banks. During a recession, most businesses including housing developers will reduce their activities to reduce loan. As previously stated prices of lands have the most influential impact on the housing price. Therefore, restriction on the use of the land would undoubtedly upset the cost of construction and ultimately the price of the completed housing. Quality of materials was also found to make dominant bearing on the prices of houses. This is not surprising because the quality of materials determined housing production costs like any other goods and services in the marketplaces. The type of land ownership was also cited as major factor influencing the prices of houses. This finding is not very surprising because leaseholders will not only have to worry about the grant rent on the land, but the land will be reverted back to freeholder on the expiration of the tenure. This is consistent with literature. The respondents also measured that climate change will affect housing price. This finding is not difficult to agree with, heavy rainfalls, floods, mudslides are gradually becoming part of homebuyers' checklist in Malaysia. Homebuyers are now demanding for houses that would be resistance to impact of earthquakes, landslides, and mudslides especially those at the hill-sides [20]. Without argument, interest rates have a significant impact on the cost of home production. Technically developers and contractors will transfer the amount they pay as interest to the homebuyers and this will, in turn, lead to increase in the housing prices.

5. CONCLUSIONS AND RECOMMENDATIONS TO THE HOUSING PROVIDERS.

Meeting the housing need has been the primary agenda of the government. However, achieving this aim has been a major difficulty. More than 90% of the households cannot afford houses in the current situation without some assistance. Many on-going houses projects are abandoned and the rate of overhang and unsold are high. This study provides insight into the determinants of housing prices. This study has found the 13 main causal factors for the increase in housing price. The practical implications of the findings reported in this study are that government needs to loosen her regulations and control on lands in order to increase homeowners and also to reduce authorities' development charges/fees. The developers also need to reduce their profit margin expectations through proper risk assessment and reduction. Future work on this topic might increase the sample size and practical measured to reduce housing prices should be examined. Also, future research could investigate the relationships among the causes of increase in housing prices and the categorization of the causal factors is required in order to examine the association among the factors. This would help in decision making because the ranking of the factors alone would not be able to provide structural advice to place managers, developers,

urban planners and policymakers.

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Factors Determining the Demand for Affordable Housing

Affordable housing has been defined as housing which is adequate in quality and location. In addition to this, it is deemed to be housing that is not so costly that it prevents its occupants from meeting their basic living needs. This study aims to develop a framework to facilitate affordable housing delivery. The data collection used was a survey questionnaire. The survey was administered to occupants within five high-rise buildings in Penang. The study also utilized a Kaiser-Meyer-Olkin measure of 0.518, and Bartlett's test of sphericity of (χ_2 (210) = 10955.942, p<0.001). The two statistical test discovered that the major determinants affecting demand for affordable housing were crime rates, housing prices and down payments. The results also demonstrated that six factors were successfully constructed using a factor analysis and assigned as factors that determined the demand for affordable housing. The research will be useful to policy makers, urban planners, developers, and contractors.

Keywords: Factors, Demand, Affordable housing, Malaysia.

1. INTRODUCTION

The concept of affordable housing is used to address low and medium income housing around the world. If a buyer allocates 30% of his or her gross monthly household income towards buying a house, it can be said that the housing is affordable. The United States Department of Housing and Urban Development [4] noted that families who paid more than 30% of their income on housing were considered to be cost-burdened and may have difficulty affording basic necessities such as food, clothing, transportation, and medical care. In Malaysia, many households cannot afford their houses because housing prices have outstripped inflation. Housing prices in Malaysia are increasing by about 6% annually [14]. Therefore, this research aims to investigate affordable housing in Malaysia in an effort to develop a framework to facilitate affordable housing delivery.

The population in Malaysia is increasing significantly. It has been found that in the year 2010, the population was only 28.59 million, while in the year 2017, the population increased to 32.14 million [2].

*Email Address: xinyinglim0708@gmail.com

2. LITERATURE REVIEW

Malaysia aims to be a fully developed country by the year 2020. The estimated population in the year 2020 will be 32.4 million, it will comprise of 16.6 million males and 15.8 million females [2]. The process of becoming a fully developed country has resulted in the demand for housing in Malaysia growing significantly; this has created a housing shortage. Indeed, it has been identified that were 4,945,140 residential units in the year 2016 [8]. An interpretation of the above statistics indicates a ratio of 6 people to one house. This ratio is considered high for a typical house in Malaysia with 2 to 3 bedrooms. Housing prices have increased by a record margin. For instance, between years 2009 to 2016, the house prices have increased by 46.17% all over Malaysia [9]. The average house price in Malaysia costs much more than 3 times an individual's annual median income. In median income terms, Malaysia houses are considered to be more expensive than homes in the United Kingdom, United States and Japan [6].

The median monthly household income has increased from RM 3,626 in 2012 to RM 4,585 in 2014, this is an annual growth rate of 11.7% [2]. Data on median monthly household income for 2016 has not been released yet, nevertheless, if a growth rate of 11.7% is applied, it is

estimated that the median monthly income in 2016 would be RM 5,720. In median income terms, affordable house in Malaysia is housing that costs around 3 times an annual medium income, which is [3 x 12 x RM 5,720 = RM 205,920] per house. This means that about 65% of Malaysian households cannot afford to own a house because their salary is below the estimated median income level of RM 5,720 in the year 2016.

Malaysia is undoubtedly experiencing a shortage in the supply of affordable houses particularly in major urban areas [10]. The undersupply of affordable homes in the local property market is expected to deteriorate due to demographic factors and current income trends [14]. Since 2012, the increase in house prices in Malaysia has outstripped the rise in income levels [13].

3. PROBLEM DESCRIPTION

Houses within Malaysia are severely unaffordable [2]. Consequently, the government has proposed schemes, programs, and incentives for developers, contractors, and homebuyers. Notwithstanding this, the prices of the houses is continuing to increase but the satisfaction levels of the homebuyers has not increased comparatively. Homebuyers seek adequate housing that they afford to purchase [8]. Homebuyers also take into account factors such good location of the housing with amenities, a secure tenure, access to housing finance and a degree of mobility and choice, when they look for a house [6]. Investigating the factors that predict homebuyer demand will facilitate decision-making in the delivery of affordable housing. Previous researches conducted has investigated homebuyers' requirements, nevertheless, they have not focused on affordable housing and have not analysed the interaction between the requirements.

4. THE AIM OF THE RESEARCH

The aim of the research is to develop a framework to facilitate affordable housing delivery.

5. THE OBJECTIVE OF THE RESEARCH

To achieve the above aim, the following objectives have been set:
a. Prioritize the factors that affect demand for affordable housing
b. Categorize the factors determining demand for affordable housing.

6. RESEARCH METHODOLOGY

Research can be conducted through a variety of methods, but what determine the 'best' method are the purposes of the research in terms of aims, objectives, questions or hypothesis. The study utilised a survey questionnaire which collected primary data. The different variables included in the survey were adopted or adapted from literature [5, 11, 12] and the authors' experiences. The survey was administered to occupants within six high-rise buildings in Penang. The levels of importance within the survey questionnaire were measured on a Likert scale of 1 to 5. In the scale, 1 represented extremely important, 5 denoted very low important, 3 denoted important and 2 and 4 fell in between. The housing estate was located in Penang. Each of the housing units consisted of 3 bedrooms and 2 bathrooms with a total built up area between 500 to 999 square feet. A total of 529 home owner were surveyed.

7. RESEARCH ANALYSIS AND FINDINGS

It was found that 94.01% of the respondents agreed that 21 factors within the survey determined the demand for affordable housing in Malaysia. This is demonstrated show in Figure 1.

To further confirm the strength of the data, Bartlett's test was conducted. The results signified a lack of multicollinearity among the factors and that the respondents were drawn from those with similar experiences ($x2$ (210) = 10953.982, p<0.001).
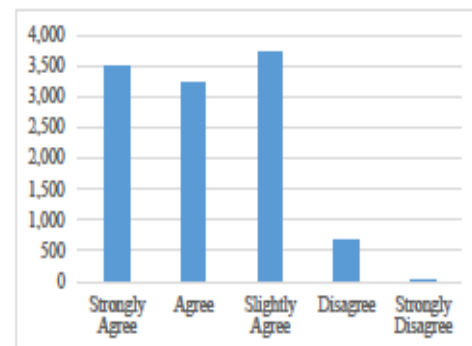
Fig.1. Factors determine the demand for affordable housing in Malaysia (Frequency)

The results shown from Table 1, also indicate that reliability and validity of the data was very good.

Table.1. Reliability and Validity Factors Determine the Demand for Affordable Housing in Malaysia

Factors	Reliability	Validity	Mean	Std. Deviation
Crime Rate	0.866	0.891	1.442	0.789
House Price	0.860	0.869	1.692	0.611
Down Payment	0.859	0.653	1.839	0.878
Accessibility to Working Place	0.868	0.472	1.849	0.759
Quality of House	0.866	0.768	1.906	0.885
Leasehold / Freehold House	0.858	0.720	1.957	0.883
Interest Rate on Loan	0.866	0.811	2.066	0.924
Access to Children School & Child Day Care Centre	0.869	0.768	2.081	0.768
Household Income	0.866	0.830	2.087	1.002
Ability to Accommodate those with Mobility Restriction	0.851	0.774	2.098	0.867
Available of Own Transports	0.849	0.792	2.153	0.918
Neighborhood	0.852	0.818	2.195	0.966
House Built-up Area	0.857	0.892	2.234	0.867
Availability of Mortgage	0.870	0.765	2.274	0.841
Family Size	0.870	0.414	2.301	0.988
Operation & Maintenance Costs	0.848	0.687	2.333	1.046
Adaptability	0.848	0.911	2.382	0.86
Type of House	0.860	0.919	2.437	0.903
Availability of Credit/Loan Facility	0.856	0.788	2.458	1.013
Available of Public Transport	0.851	0.892	2.52	1.035
Market/ Shopping Mall	0.855	0.818	2.681	0.747

One sample t-test was computed to determine the hypothesis that each of the factors would determine demand for affordable housing in Malaysia. For this reason, the null hypothesis was that the factors would not determine the demand for affordable housing in Malaysia ($H_0: U=U_0$) and the research hypothesis was that the factors would determine demand for affordable housing in Malaysia ($H_r: U>U_0$). U_0 was the population mean or comparison standard mean and the critical level off point was set at 1.5. All the factors were statistically significant.

Therefore, all the factors were adequate and suitable to be included in the survey to achieve the aims of the research.
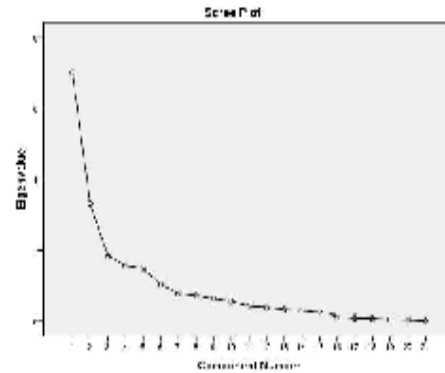
Fig.2. Factors determine the demand for affordable housing in Malaysia (Screen Plot)

A factor analysis was used to construct the framework of the survey completed by homeowners. The Bartlett's test of sphericity and Kaiser-Meyer-Olkin measure of sampling adequacy were both tests used to determine the factorability of the matrix as a whole. The resultant value of the Bartlett's test of sphericity was significant ($p<0.001$, $p=0.000$).

Table 2 shows that there were 6 components extracted from the analysis. The eigenvalues of these 6 components was greater than 1 which was accepted in the analysis. The total percentage of variance explained by Component 1 to Component 6 was 77.349% which is considered acceptable.

The first component was named transportation cost because of its contented and comprised of seven factors that determines the demand for affordable housing in Malaysia. More specifically, it explained 21.06% of the variance within the model. The factor loadings for the seven factors ranged between 0.666 to 0.866. A second-order factor analysis combined these seven factors into a single component named transportation cost. The Kaiser-Meyer-Olkin measure of sampling adequacy confirmed a good relationship between the factors ($MSA = 0.709$, $x^2(21) = 3036.128$, $p<0.001$). The seven factors collectively explained 64.53% of the variance within the model. The validity ranged between 0.443 to 0.750. The factors 'down payment' was the least validity (0.483). The collective Cronbach's Alpha reliability for the four factors was 0.906. All these factors relate to transportation cost that home buyers take into account when they look to purchase affordable housing. Homebuyers are looking well design for their neighborhood which is consider of good public transportation can save their own transportation, car operation and maintenance cost for their house down payment.

The second component was named, repayment ability because of its contented and comprised of five factors that determined the demand for affordable housing in Malaysia. More specifically, it explained 15.68% of the variance

within the model. The factor loadings for the five factors range between 0.640 to 0.911. A second-order factor analysis combined these five factors into a single component named repayment ability. The Kaiser-Meyer-Olkin measure of sampling adequacy confirmed a good relationship between the factors (MSA = 0.689, x^2 (10) = 1805.548, p<0.001). The five factors collectively explained 65.68% of the variance within the model. The validity ranged between from 0.410 to 0.829, "family size" was the least validity (0.410). The collective Cronbach's Alpha reliability for the three factors was 0.863. The implication of these results indicates that homebuyers focus on ensuring that their household income whether afford to their daily usage for the family size and pay their

housing loan. Better accessibility to working place able to reduce the cost of transportation and it's able for repayment interest rate on loan.

The third component was named, limitation on consumable because of its contented and comprised of three factors that determined the demand for affordable housing in Malaysia. More specifically, it explained 12.77% of the variance within the model. The factor loading for the three factors ranged between 0.833 to 0.922. A second-order factor analysis combined these three factors into a single component named limitation on consumable. The Kaiser-Meyer-Olkin measure of sampling adequacy confirmed a good relationship

Table 2. Factors analysis determining the demand for affordable housing in Malaysia

Factors	Component					
	Transportation Cost	Repayment Ability	Limitation on Consumable	Satisfaction	Neighborhood Security	Debt Impact
Available of Public Transport	0.842					
Neighborhood	0.827					
Down Payment	0.798					
Available of Own Transports	0.665					
Availability of Credit/Loan Facility	0.647					
Ability to Accommodate those with Mobility Restriction	0.636					
Operation & Maintenance Costs	0.618					
Household Income		0.910				
Interest Rate on Loan		0.900				
Quality of House		0.875				
Accessibility to Working Place		0.684				
Family Size		0.639				
Market/ Shopping Mall			0.824			
Type of House			0.803			
House Built-up Area			0.775			
House Price				0.892		
Adaptability				0.659		
Crime Rate					0.927	
Leasehold / Freehold House					0.578	
Availability of Mortgages						0.874
Access to Children School & Child Day Care Centre						0.870

(MSA = 0.668, x^2 (3) = 696.735, p<0.001). The three factors collectively explained 75.68% of the variance within the model. The validity ranged between 0.695 to 0.850, "house built-up area" was the least validity (0.695). The collective Cronbach's Alpha reliability for the three

factors was 0.831. This means that homebuyers take into account these limitation on consumable when purchasing affordable housing. House built-up area is limit the consumption.

The fourth component was named, satisfaction because of its contented and comprised of two factors that

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determined the demand for affordable housing in Malaysia. More specifically, it explained 10.47% of the variance within the model. The factor loading for the two factors was both 0.935. A second-order factor analysis combined these two factors into a single component named **satisfaction**. The Kaiser-Meyer-Olkin measure of sampling adequacy indicated a good relationship between the factors (MSA = 0.500, x^2 (1) = 430.354, p<0.001). The two factors collectively explained 87.36% of the variance within the model. The two factors contained the same validity which was **0.874. The collective Cronbach's Alpha reliability for the two factors was 0.827. The results indicated that house prices and adaptability of the house is taken into account by homebuyers when they purchase affordable housing.**

The fifth component was named, **neighborhood security** because of its contented and comprised of two factors that determined the demand for affordable housing in Malaysia. More specifically, it explained 9.96% of the variance within the model. The factor loading for the two factors was both 0.885. A second-order factor analysis combined these two factors into a single component named **neighborhood security**. The Kaiser-Meyer-Olkin measure of sampling confirmed a good relationship between the factors (MSA = 0.500, x^2 (1) = 203.212, p<0.001). The two factors collectively explained 78.29% of the variance within the model. The two factors contained the same validity which was **0.783. The collective Cronbach's** Alpha reliability for the two factors **was 0.720. The results meant that homebuyers were concerned about crime rates and whether the house were leasehold or freehold when they purchased affordable housing. Crime rate related with the price of the house. Low cost house have the higher crime opportunity due to the mixture of different residential class.**

The sixth component was named **debt impact** because of its contented and comprised of two factors that determined the demand for affordable housing in Malaysia. More specifically, it explained 7.42% of the variance within the model. The factor loadings for the two factors was both 0.876. A second-order factor analysis combined these two factors into a single component named **debt impact**. The Kaiser-Meyer-Olkin measure of sampling adequacy confirmed a good relationship between the factors (MSA = 0.500, x^2 (1) = 177.036, p<0.001). The two factors collectively explained 87.36% in this model. The two factors contained same validity which was 0.767. The **collective Cronbach's Alpha reliability for the two factors was 0.695. The results indicated the availability of mortgages and convenient access to their children's schools and child day care centres were factors which affect the demand for affordable housing. Easier to access to children school and child day care centres able to save more cost for mortgages.**

8. CONCLUSION

Affordable **housing delivery has become a high priority for most countries as it plays a significant role in economic** development and growth. While affordable housing is an abstract concept, examining the criteria that affects the housing delivery is critical. This research has investigated the demands of house buyers within the housing market by developing a framework for affordable housing. The framework critically examined the factors determining the demand for affordable housing. Policy makers, urban planners, developers, homebuyers, and contractors can use this framework in their housing decision-making processes.

Policy makers, urban planners, developers, and contractors should also be more concerned with the demand of affordable housing by median income earners within Malaysia especially in Kuala Lumpur, Penang and Johor. Majority of Malaysian living in cities have higher commitment for their basic necessities. This framework will also be able to provide insight in to their housing decision-making processes.

ACKNOWLEDGMENTS

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QUESTIONNAIRE FOR STRATEGIES FOR AFFORDABLE HOUSING DELIVERY

IN MALAYSIA

Dear Sir/ Ms/ Mdm,

Currently, we are conducting a research on 'Strategies for Affordable Housing in Malaysia'. The aim of this research is to deliver a framework for affordable housing. Affordable housing is housing for those in the low and medium group. To achieve this objective, your feedback to this questionnaire is extremely important. Information obtained is strictly confidential and will only be used for statistic and academic purposes only.

Respondent's Information

Nationality: Malaysian ☐   Non-Malaysian ☐

Academic background: PMR ☐   SPM ☐   A-level ☐   Diploma ☐   BSc ☐   Master ☐

Others: _____

Current position: Chief Executive Officer ☐   Director ☐   Manager ☐

Project Manager ☐   Senior Architect ☐   Architect ☐   Drafter ☐

Clerk of Work ☐   Contract Manager ☐   Construction Manager ☐

Engineer ☐   Others_____

Professional Background: Architect ☐   Engineer ☐   Quantity Surveyor ☐

Land Surveyor ☐   Others: _____

Working experience: Less than 5 years ☐   5 – 10 years ☐   10 – 15 years ☐

15 – 20 years ☐   More than 20 years ☐

Your organisation: Government ☐   Private firm ☐   Contractor ☐   Developer ☐

Private Client ☐   Supplier ☐   Others: _____

You are a member of: [Please Tick All That Applies]

REHDA - Real Estate and Housing Developers' Association Malaysia ☐

National House Buyers Association of Malaysia ☐ The Malaysian Developers' Council☐ ☐

Building Materials Distributors of Association of Malaysia ☐

Board of Surveyor Malaysia ☐   Board of Architects Malaysia ☐

Board of Engineers Malaysia ☐   Other: _____

Have you been involves in "affordable housing" design or construction before?

Yes ☐   No ☐

Question

1) Which materials will have the **highest risk** of unstable supply during construction? (Please (√) the suitable answer base on your opinion)

Scale ⟍ Material	Extremely Shortage	High Shortage	Shortage	Low Shortage	Very low Shortage
Cement					
Sand					
Concrete					
Brick					
Tiles					
Window					
Door					
Paint					
Formwork					
Reinforcement Bar					
Ironmongeries					
Rainwater Goods					
Waterproofing					
Aggregates					
Please include **other** specific material will have the biggest risk of unstable supply during construction?					

2) Please rate the extent to **factors** that will cause Malaysia **housing price to increase**. (Please (√) the suitable answer base on your opinion)

Factor	Strongly Agree	Agree	Slightly Agree	Disagree	Strongly Disagree
Shortage of Material					
Quality of Material & Component Use					
Strategic factors (eg: School, Hospital, Place of Job, Market & etc.)					
Location – Urban/Rural					
Availability Transportation					
Size of the House					
Leasehold / Freehold House					
Layout of the House					
Stamp Duty					
Permit Fees					
Currency Exchange Rate					
Households confidence on future price					
Interest rates					
Planning restriction on the use of land					
Developers' profit margin					
number of new houses being built					
Geographical factors					
Rising labour costs					
Economic uncertainty and financial risks					
Innovation and skills					
Climate changes					
What **other** specific factor cause the increasing of Malaysia housing price?					

Thank you for sparing your valuable time to complete this questionnaire.

Survey on the Determinants of Affordable Housing Demand in Malaysia

Dear Sir/ Ms/ Mdm,

We are currently conducting a research to understand homebuyers behaviours towards 'Affordable Housing'. Housing is deemed affordable to those with a median household income as rated by country, state (province), region or municipality by a recognised Housing Affordability Index. Your feedback to this questionnaire is extremely important towards completing this research. Information obtained is strictly confidential and will only be used for statistical and mathematical analyses only.

Please tick where appropriate

1. Your position in the family is?
   Father □   Mother □   Children □   Others □   Please specify _____

2. Your highest academic qualification:
   PMR □   O-Level/SPM □   A-Level/STPM □   Diploma □
   Bachelor Degree □   Master □   Others □   Please
   Specify_____

3. Your type of house?
   Single Storey Terrace □ 2-3 Storey Terrace □   Single Storey Semi- Detach □
   2-3 Storey Semi- Detach □   Detach □   Town House □   Cluster □
   Low Cost House □   Low Cost Flat □   Flat □   Service Apartment □
   Condominium/ Apartment □   Others □   Please Specify_____

4. Does your family have own transportation?
   Yes □   No □

5. How many cars do your family own?
   None□ 1 □   2 □   3 □   More than 3 □

6. How cars can your parking space accommodates?
   1 □   2 □   3 □   More than 3 □   Open Parking Space □
   Others □   Please Specify_____

7. Distance from home to place of work
   Less than 5km□   5 – 10km □   10 – 15km □   15 – 20km □   More than 20km □

8. Distance from home to public bus station (rapid bus)
   Less than 5km□   5 – 10km □   10 – 15km □   15 – 20km □   More than 20km □

9. Distance from home to train station
   Less than 5km□   5 – 10km □   10 – 15km □   15 – 20km □   More than 20km □

10. Distance from home to bus terminal
    Less than 5km□   5 – 10km □   10 – 15km □   15 – 20km □   More than 20km □

11. The current price (purchase) of your house as:
    Below RM199K □   RM200K – 299K □   RM300K – 399K □   RM400K – 499K □
    More than RM500K □

12. What is the size of the house:
    Less than 499sf □   500 – 999sf □   1000 – 1499sf □   More than 1500sf □
    Others □   Please Specify_____

13. Numbers of member living in the house:
    1 person □   2 persons □   3 persons □   4 persons □   More than 5 persons □

14. On average, your family's monthly income is? Less than RM1,999 □   RM2,000 - 3,999 □
    RM4,000 - 5,999 □   RM6,000 - 7,999 □   RM8,000 - 9,999 □
    More than RM10,000 □

15. Do you own or rent the house you are living in? Own □   Rent □

16. How many % of your family income you use to pay for utilities fees (water, electricity, telephone, internet & etc. bill) & every month?
    Less than 5% □   6 – 10% □   11% – 15% □   16% – 20% □
    21% – 25% □   26% – 30% □   More than 30% □

17. Please rate the extent to which each of the following factors will **determine** the demand for **affordable housing**.

Scale Determinant	Extremely Important	Very Important	Important	Low Important	Very low Important
Household income					
Interest rate on loan					
Family size					
Quality of house					

Scale \ Determinant	Extremely Important	Very Important	Important	Low Important	Very low Important
Accessibility to working place					
Availability of mortgages					
Access to children school and child day care centre					
Market/ Shopping mall					
Availability of credit/loan facility					
House price					
House Built-up area					
Available of public transport					
Available of own transports					
Neighbourhood					
Type of house					
Operation and maintenance costs					
Adaptability – ability to change the physical and morphological of the housing					
Leasehold / Freehold House					
Crime Rate					
Down payment					
Ability to accommodate those with mobility restriction – the disables and elderlies					

Please include **other** specific factors will determine the demand for affordable housing?

Thank you for sparing your valuable time to complete this questionnaire.

Frequency of Individual Factors Cause Malaysia Housing Prices to Increase

Shortage of Material

		Frequency	Percent	Cumulative Percent
Valid	Strongly Agree	7	6.1	6.1
	Agree	66	57.4	63.5
	Slightly Agree	24	20.9	84.3
	Disagree	16	13.9	98.3
	Strongly Disagree	2	1.7	100.0
	Total	**115**	**100.0**	

Quality of Material & Component Use

		Frequency	Percent	Cumulative Percent
Valid	Strongly Agree	6	5.2	5.2
	Agree	30	26.1	31.3
	Slightly Agree	65	56.5	87.8
	Disagree	13	11.3	99.1
	Strongly Disagree	1	0.9	100.0
	Total	**115**	**100.0**	

Strategic Factors

		Frequency	Percent	Cumulative Percent
Valid	Strongly Agree	2	1.7	1.7
	Agree	63	54.8	56.5
	Slightly Agree	46	40.0	96.5
	Disagree	4	3.5	100.0
	Total	**115**	**100.0**	

Location – Urban/Rural

		Frequency	Percent	Cumulative Percent
Valid	Strongly Agree	18	15.7	15.7
	Agree	83	72.2	87.8
	Slightly Agree	12	10.4	98.3
	Disagree	2	1.7	100.0
	Total	**115**	**100.0**	

Availability Facilities

		Frequency	Percent	Cumulative Percent
Valid	Strongly Agree	13	11.3	11.3
	Agree	25	21.7	33.0
	Slightly Agree	29	25.2	58.3
	Disagree	44	38.3	96.5
	Strongly Disagree	4	3.5	100.0
	Total	**115**	**100.0**	

Size of the House

		Frequency	Percent	Cumulative Percent
Valid	Strongly Agree	10	8.7	8.7
	Agree	56	48.7	57.4
	Slightly Agree	48	41.7	99.1
	Disagree	1	0.9	100.0
	Total	**115**	**100.0**	

Leasehold / Freehold House

		Frequency	Percent	Cumulative Percent
Valid	Agree	54	47.0	47.0
	Slightly Agree	33	28.7	75.7
	Disagree	28	24.3	100.0
	Total	**115**	**100.0**	

Layout of the House

		Frequency	Percent	Cumulative Percent
Valid	Strongly Agree	3	2.6	2.6
	Agree	29	25.2	27.8
	Slightly Agree	29	25.2	53.0
	Disagree	26	22.6	75.7
	Strongly Disagree	28	24.3	100.0
	Total	**115**	**100.0**	

Stamp Duty

		Frequency	Percent	Cumulative Percent
Valid	Strongly Agree	5	4.3	4.3
	Agree	18	15.7	20.0
	Slightly Agree	38	33.0	53.0
	Disagree	25	21.7	74.8
	Strongly Disagree	29	25.2	100.0
	Total	**115**	**100.0**	

Permit Fees

		Frequency	Percent	Cumulative Percent
Valid	Strongly Agree	3	2.6	2.6
	Agree	17	14.8	17.4
	Slightly Agree	38	33.0	50.4
	Disagree	28	24.3	74.8
	Strongly Disagree	29	25.2	100.0
	Total	**115**	**100.0**	

Currency Exchange Rate

		Frequency	Percent	Cumulative Percent
Valid	Strongly Agree	8	7.0	7.0
	Agree	24	20.9	27.8
	Slightly Agree	23	20.0	47.8
	Disagree	24	20.9	68.7
	Strongly Disagree	36	31.3	100.0
	Total	**115**	**100.0**	

Households Confidence on Future Price

		Frequency	Percent	Cumulative Percent
Valid	Strongly Agree	12	10.4	10.4
	Agree	38	33.0	43.5
	Slightly Agree	23	20.0	63.5
	Disagree	42	36.5	100.0
	Total	**115**	**100.0**	

Interest Rates

		Frequency	Percent	Cumulative Percent
Valid	Strongly Agree	9	7.8	7.8
	Agree	35	30.4	38.3
	Slightly Agree	41	35.7	73.9
	Disagree	30	26.1	100.0
	Total	**115**	**100.0**	

Planning Restriction on the Use of Land

		Frequency	Percent	Cumulative Percent
Valid	Strongly Agree	6	5.2	5.2
	Agree	24	20.9	26.1
	Slightly Agree	79	68.7	94.8
	Disagree	5	4.3	99.1
	Strongly Disagree	1	.9	100.0
	Total	**115**	**100.0**	

Developers' Profit Margin

		Frequency	Percent	Cumulative Percent
Valid	Strongly Agree	12	10.4	10.4
	Agree	63	54.8	65.2
	Slightly Agree	28	24.3	89.6
	Disagree	10	8.7	98.3
	Strongly Disagree	2	1.7	100.0
	Total	**115**	**100.0**	

Number of New Houses Being Built

		Frequency	Percent	Cumulative Percent
	Strongly Agree	3	2.6	2.6
	Agree	28	24.3	27.0
Valid	Slightly Agree	62	53.9	80.9
	Disagree	22	19.1	100.0
	Total	**115**	**100.0**	

Geographical Factors

		Frequency	Percent	Cumulative Percent
	Strongly Agree	3	2.6	2.6
	Agree	41	35.7	38.3
Valid	Slightly Agree	32	27.8	66.1
	Disagree	39	33.9	100.0
	Total	**115**	**100.0**	

Rising Labour Costs

		Frequency	Percent	Cumulative Percent
	Strongly Agree	14	12.2	12.2
	Agree	40	34.8	47.0
Valid	Slightly Agree	24	20.9	67.8
	Disagree	37	32.2	100.0
	Total	**115**	**100.0**	

Economic Uncertainty and Financial Risks

		Frequency	Percent	Cumulative Percent
	Strongly Agree	13	11.3	11.3
	Agree	40	34.8	46.1
Valid	Slightly Agree	27	23.5	69.6
	Disagree	35	30.4	100.0
	Total	**115**	**100.0**	

Innovation and Skills

		Frequency	Percent	Cumulative Percent
Valid	Strongly Agree	11	9.6	9.6
	Agree	61	53.0	62.6
	Slightly Agree	35	30.4	93.0
	Disagree	7	6.1	99.1
	Strongly Disagree	1	.9	100.0
	Total	**115**	**100.0**	

Climate Changes

		Frequency	Percent	Cumulative Percent
Valid	Agree	55	47.8	47.8
	Slightly Agree	32	27.8	75.7
	Disagree	25	21.7	97.4
	Strongly Disagree	3	2.6	100.0
	Total	**115**	**100.0**	

APPENDIX H

Frequency of Individual Materials will have the Highest Risk of Unstable Supply

during Construction

Cement

		Frequency	Percent	Cumulative Percent
Valid	Shortage	24	20.9	20.9
	Low Shortage	34	29.6	50.4
	Very Low Shortage	57	49.6	100.0
	Total	**115**	**100.0**	

Sand

		Frequency	Percent	Cumulative Percent
Valid	Extremely Shortage	2	1.7	1.7
	High Shortage	9	7.8	9.6
	Shortage	33	28.7	38.3
	Low Shortage	28	24.3	62.6
	Very Low Shortage	43	37.4	100.0
	Total	**115**	**100.0**	

Concrete

		Frequency	Percent	Cumulative Percent
Valid	High Shortage	2	1.7	1.7
	Shortage	6	5.2	7.0
	Low Shortage	67	58.3	65.2
	Very Low Shortage	40	34.8	100.0
	Total	**115**	**100.0**	

Brick

		Frequency	Percent	Cumulative Percent
Valid	High Shortage	2	1.7	1.7
	Shortage	13	11.3	13.0
	Low Shortage	63	54.8	67.8
	Very Low Shortage	37	32.2	100.0
	Total	**115**	**100.0**	

Tiles

		Frequency	Percent	Cumulative Percent
Valid	Extremely Shortage	3	2.6	2.6
	High Shortage	3	2.6	5.2
	Shortage	6	5.2	10.4
	Low Shortage	57	49.6	60.0
	Very Low Shortage	46	40.0	100.0
	Total	**115**	**100.0**	

Window

		Frequency	Percent	Cumulative Percent
Valid	Shortage	6	5.2	5.2
	Low Shortage	37	32.2	37.4
	Very Low Shortage	72	62.6	100.0
	Total	**115**	**100.0**	

Door

		Frequency	Percent	Cumulative Percent
Valid	Shortage	4	3.5	3.5
	Low Shortage	37	32.2	35.7
	Very Low Shortage	74	64.3	100.0
	Total	**115**	**100.0**	

Paint

		Frequency	Percent	Cumulative Percent
Valid	High Shortage	7	6.1	6.1
	Shortage	26	22.6	28.7
	Low Shortage	35	30.4	59.1
	Very Low Shortage	47	40.9	100.0
	Total	**115**	**100.0**	

Formwork

		Frequency	Percent	Cumulative Percent
Valid	Extremely Shortage	5	4.3	4.3
	High Shortage	14	12.2	16.5
	Shortage	31	27.0	43.5
	Low Shortage	31	27.0	70.4
	Very Low Shortage	34	29.6	100.0
	Total	**115**	**100.0**	

Reinforcement Bar

		Frequency	Percent	Cumulative Percent
Valid	High Shortage	16	13.9	13.9
	Shortage	19	16.5	30.4
	Low Shortage	58	50.4	80.9
	Very Low Shortage	22	19.1	100.0
	Total	**115**	**100.0**	

Ironmongeries

		Frequency	Percent	Cumulative Percent
Valid	High Shortage	8	7.0	7.0
	Shortage	22	19.1	26.1
	Low Shortage	31	27.0	53.0
	Very Low Shortage	54	47.0	100.0
	Total	**115**	**100.0**	

Rainwater goods

		Frequency	Percent	Cumulative Percent
Valid	High Shortage	4	3.5	3.5
	Shortage	7	6.1	9.6
	Low Shortage	63	54.8	64.3
	Very Low Shortage	41	35.7	100.0
	Total	**115**	**100.0**	

Waterproofing

		Frequency	Percent	Cumulative Percent
Valid	High Shortage	1	0.9	0.9
	Shortage	3	2.6	3.5
	Low Shortage	60	52.2	55.7
	Very Low Shortage	51	44.3	100.0
	Total	**115**	**100.0**	

Aggregates

		Frequency	Percent	Cumulative Percent
Valid	High Shortage	6	5.2	5.3
	Shortage	47	40.9	46.5
	Low Shortage	35	30.4	77.2
	Very Low Shortage	26	22.6	100.0
	Total	114	99.1	
Missing	System	1	0.9	
Total		**115**	**100.0**	

Frequency of Individual Factors will Determine the Demand for Affordable

Housing

Household Income

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	187	35.3	35.3
	Very important	166	31.4	66.7
	Important	119	22.5	89.2
	Low important	57	10.8	100.0
	Total	**529**	**100.0**	

Interest Rate on Loan

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	**175**	**33.1**	**33.1**
	Very important	**178**	**33.6**	**66.7**
	Important	**142**	**26.8**	**93.6**
	Low important	**34**	**6.4**	**100.0**
	Total	**529**	**100.0**	

Family Size

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	155	29.3	29.3
	Very important	95	18.0	47.3
	Important	256	48.4	95.7
	Low important	11	2.1	97.7
	Very low important	12	2.3	100.0
	Total	**529**	**100.0**	

Quality of House

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	211	39.9	39.9
	Very important	180	34.0	73.9
	Important	115	21.7	95.7
	Low important	23	4.3	100.0
	Total	**529**	**100.0**	

Accessibility to Working Place

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	198	37.4	37.4
	Very important	213	40.3	77.7
	Important	118	22.3	100.0
	Total	**529**	**100.0**	

Availability of Mortgages

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	104	19.7	19.7
	Very important	206	38.9	58.6
	Important	189	35.7	94.3
	Low important	30	5.7	100.0
	Total	**529**	**100.0**	

Access to Children School & Child Day Care Centre

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	136	25.7	25.7
	Very important	214	40.5	66.2
	Important	179	33.8	100.0
	Total	**529**	**100.0**	

Market/ Shopping Mall

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	72	13.6	13.6
	Very important	43	8.1	21.7
	Important	396	74.9	96.6
	Low important	18	3.4	100.0
	Total	**529**	**100.0**	

Availability of Credit/Loan Facility

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	121	22.9	22.9
	Very important	129	24.4	47.3
	Important	195	36.9	84.1
	Low important	84	15.9	100.0
	Total	**529**	**100.0**	

House Price

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	205	38.8	38.8
	Very important	282	53.3	92.1
	Important	42	7.9	100.0
	Total	**529**	**100.0**	

House Built-up Area

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	133	25.1	25.1
	Very important	157	29.7	54.8
	Important	221	41.8	96.6
	Low important	18	3.4	100.0
	Total	**529**	**100.0**	

Available of Public Transport

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	139	26.3	26.3
	Very important	54	10.2	36.5
	Important	258	48.8	85.3
	Low important	78	14.7	100.0
	Total	**529**	**100.0**	

Available of Own Transports

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	188	35.5	35.5
	Very important	72	13.6	49.1
	Important	269	50.9	100.0
	Total	**529**	**100.0**	

Neighbourhood

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	139	26.3	26.3
	Very important	214	40.5	66.7
	Important	110	20.8	87.5
	Low important	66	12.5	100.0
	Total	**529**	**100.0**	

Type of House

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	72	13.6	13.6
	Very important	232	43.9	57.5
	Important	147	27.8	85.3
	Low important	78	14.7	100.0
	Total	**529**	**100.0**	

Operation & Maintenance Costs

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	152	28.7	28.7
	Very important	127	24.0	52.7
	Important	172	32.5	85.3
	Low important	78	14.7	100.0
	Total	**529**	**100.0**	

Adaptability

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	103	19.5	19.5
	Very important	151	28.5	48.0
	Important	245	46.3	94.3
	Low important	30	5.7	100.0
	Total	**529**	**100.0**	

Leasehold / Freehold House

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	218	41.2	41.2
	Very important	116	21.9	63.1
	Important	195	36.9	100.0
	Total	**529**	**100.0**	

Crime Rate

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	394	74.5	74.5
	Very important	36	6.8	81.3
	Important	99	18.7	100.0
	Total	**529**	**100.0**	

Down Payment

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	205	38.8	38.8
	Very important	252	47.6	86.4
	Important	24	4.5	90.9
	Low important	48	9.1	100.0
	Total	**529**	**100.0**	

Ability to Accommodate those with Mobility Restriction

		Frequency	Percent	Cumulative Percent
Valid	Extremely important	175	33.1	33.1
	Very important	127	24.0	57.1
	Important	227	42.9	100.0
	Total	**529**	**100.0**	