

THE RELATIONSHIP BETWEEN DEMOGRAPHIC FACTORS AND HOUSING AFFORDABILITY

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Abstract

Housing represents the largest single lifetime investment to most individuals. However, others will see the importance of housing as a shelter and to fulfil their fundamental needs only. The relationship between demographic factors, house prices and housing affordability, is important, in the context of such need, since there is an increasing volume of literatures detailing the relationship between affordable housing needs and populations in Malaysia. The first objective of this paper is to study the level of affordable housing price in urban areas. The second objective is to study the relationship between demographic factors and housing affordability, by taking in Johor Bahru as a case. A survey has been carried out by using questionnaires distributed among 200 respondents in the district of Johor Bahru. A total of 183 were returned. The results were analysed using frequency, Likert Scaling, cross tabulation, Pearson and bivariate correlation. The study found that there was a significant correlation between demographic factors in determining affordable housing within Johor Bahru area. Demographic factors such as marital status, number of household, age distribution, educational level, and household income of different respondents might have influenced the housing market and have resulted in different levels of affordability. This study also disclosed that affordable housing price in the study area was not more than RM150, 000 per unit. Besides, people preference was more focussed on double and single storey terraced houses.

Keywords: Demographic, housing affordability, housing market.

1.0 INTRODUCTION

Housing does not only provide shelter for a family but is seen as a centre of its total residential environment (Wahab, 1991). Housing acts as a focus of economic activity, a symbol of achievement, social acceptance and an element of urban growth. To most individuals, housing represents the largest single investment of a lifetime. However, others see housing as a shelter and to fulfil their fundamental needs only.

Malaysia has been experiencing a rapid urban growth since the 1950's due to the increasing population and other economic activities. The high rate of urban growth was attributed to migration, increase in population size and income level, which has significantly contributed

to housing market. The conditions of housing market have also changed due to increasing demand and fluctuating price. The buying of a residential property became influenced by affordability level. Indeed, the affordability level is important for one to buy and own a residential property (Bujang, 2006).

Demographic factors are responsible for driving the housing price in the local market. Price level affects local housing affordability by income groups. However, the relationship between demographic elements and housing affordability that affects the local market is still not clear and needs to be reviewed.

2.0 RESEARCH BACKGROUND

2.1 Definition and Concepts of Demographic and Housing Affordability

Analysing correlation between demographic factors and housing markets is quite interesting based on the premise that demographic elements are the primary drivers of the real estate market, whereby some people believe that the relationship exists in the market only in the long-term.

Clara (2006) defined demographic as a study of human populations with emphasises on the statistical analysis of the quantities and characteristics of the people who live in a particular area, especially in relation to their age, how much money they have and what they spend it on. Primarily, demographic study involves the measurement of size, growth, density, distribution, and diminution of the number of people, the proportion living, being born, or dying within some area or region, and the related functions of fertility, mortality and marriage (Plane, 1993). Socio-economic factors such as age, income, sex, occupation, education, family size, and the like are also included (Online Business Dictionary). Thus, demography is a study of the characteristics of human populations, such as size, growth, density and distribution.

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, 2002) 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.

Housing affordability can be viewed in three different ways: purchase affordability, repayment affordability, and income affordability (Quan and Hill, 2008). Purchase affordability is relevant in considering whether a household is able to borrow enough funds to purchase a house. Repayment affordability is concerned with the burden on the household to pay the mortgage, and income affordability is referred to the measurement of the ratio of house prices to the income of the purchaser. Despite criticism from Glaser and Gyourko (2003) about these three methods of measurement of house affordability, Bujang (2006) has used a formula for determining the housing affordability based on 30 percent of the annual household gross income as follows:

$$HAP = 30\% (y) \times \frac{1 - (1 + i)^{-n}}{i}$$

Where: HA = Housing affordability price

y = Gross household income

i = Interest rate for end financing

n = Numbers years for end financing period

2.2 Demographic Factors Influencing Housing Market and Affordability

Idrus and Ho (2008) demonstrated that demographic factors are important variables for housing price determination in the long term. Affordability remains a major concern due to high prices of existing properties and the lack of supply of affordable and well located properties within urban centre.

Theoretically, buying a residential unit is based on interest. The most important factors influencing it are price, location and population's socio economic environment (Rossi, 1955).

Lowry (1974) put forward a descriptive study that explained the demand of a residential unit from the aspect of income, number of household, occupation and transportation cost. Rosen (1974) considered income, age of a family leader, gender, number of household, and education as factors influencing the demand for a residential unit. Mohd Zain (1989) stated that sizes, structure, and population's rate of growth can be the factors of a future demand for housing.

Stone (2006) did not consider affordability an inherent characteristic of housing, but rather a relationship between incomes and relative prices. Income and other demographic factors may influence demand in the market due to people affordability. Idrus and Ho (2008) listed it among other factors that affect demand for housing in the market. They are the role of the demographic, satisfaction and personal preferences of resident. They then elaborated that these personal preferences varies by housing categories, zones, size of projects, and period of projects.

Mar Iman (2002) cited that property demand could be categorized according to its physical, location, population, socio-economic, and market. Myers (1990) categorized socio-economic, market and demographic determinant as macro factors. Among these factors are population size, population age, income and affordability, interest rate and availability of saving. Myers (1990) and Sirat et al, (1999) pointed out that, the demographic factors may affect the demand for housing, whereby the higher demand is associated with the bigger population. Meanwhile, age distribution favouring the time period of starting up a family will impact a greater need for housing. The wealth factors as well as the net return to home ownership like employment, education level, and household's income are very positively related with the demand and affordability level.

Additionally, Velilla and Olympia (2002) noted that, in areas where unemployment remains persistently above the national average, average incomes are likely to be lower and confidence among buyers will be negatively affected. Likewise, the bigger the family size, the better educated the person is and the permanency of the

job the person has further incentive to own a house.

Mar Iman (2006) has highlighted several types of demographic trends that drive real estate market. These include population, migration, millions of echo-boomers entering the real estate market, transfer of wealth to the baby boomers from their ageing parents and social trends. These types of demographic trends have been the powerful sources of real estate demand in the past and will continue in the future. Canadian Housing Observer (2003) points out that housing needs and preferences are also influenced by the characteristics of individuals in a population, particularly by age, ethnicity, and family status. Both the growth in the population and its characteristics influence the rate of household formation, which in turn, is the key determinant of housing demand. Mickle's (2001) also noted that the changes in the number of households seeking housing through natural increases in population, increased household formations and regional population migrations, among others will influence the demand for housing.

Linneman and Megbolugbe's (1992) interpreted that the problem of affordability level especially for lower and middle-class households is due to the low levels of job skills and education that they had. It, then, began to experience affordability problems for these groups of people, not because of the housing prices had increased dramatically, but their incomes became stagnant and could not cope with the price offered in the market. It is clearly stated that the level of education will determine the income earned among the people and in turn, it will differentiate the affordability level in owning a house.

2.3 Relationship between Demographic Pattern and Housing Affordability in Johor Bahru

It is noted that property market in Johor compare to other states, have the highest property overhang in Malaysia in terms of the number of various types of unsold properties. Table 1 below shows the comparison between housing supply

and housing needs in peninsular Malaysia in 2000 and 2005. It shows the 4 regions in Peninsular Malaysia that still face surplus of housing in which Johor is stated to be critical within the last 5 years. It is clear that market has been oversupplied.

Table 1: Comparison between housing supply and housing need in Peninsular Malaysia, in 2000 and 2005

Region	Housing Supply	Housing Needs		Total Surplus	
	2000	2000	2005	2000	2005
Northern Region	1,473,300	1,110,400	1,253,100	362,900	219,300
Central Region	2,108,200	1,503,000	1,830,700	605,200	277,500
Southern Region	956,600	583,100	671,000	373,500	285,600
Eastern Region	799,900	744,700	828,100	55,200	(28,200)
Peninsular Malaysia	5,338,000	3,941,200	4,583,000	1,396,800	755,000

Source: Adapted from Housing Technical Report, National Physical Plan (2002).

Table 2: Total Population, Household and Residents by the Administrative Areas of the Local Authorities in the District of Johor Bahru.

Local Authority	Total Population	Total Household	Total Residential property
JBCC	433,624	94,127	105,197
JBTMC	390,889	84,088	106,229
KuMC	121,235	24,236	35,501
PGLA	46,245	10,059	12,195
JBDLPA	167,085	34,117	NA*
Total		246,627	259,122

*Note: Not Available.

Source: Malaysian Population and Housing Census, 2000, Malaysian Statistical Department, (2001); Bujang (2006).

In order to keep the balance between supply and demand, various factors relating to demand for housing have been identified which includes economic situation, the role of demographic trends, personal preferences of residence and

many more. Among them, many academicians considered demographic trends to play significant role in the housing market in urban area. Demographic factors such as population, household size and income, employment, education level and age distribution can influence the pattern of demand and supply in housing market.

Golland and Gillen (2004) stressed that, to ensure the local housing requirement is adequately met, planners should recognize that the housing requirements are not only driven by the population trend but also by the affordability of the population within the area. They also clarified that in estimating the overall housing needs it is necessary to take into account households' income, their ability to pay, their preference in terms of price and location and their choice in terms of tenure, types, form and method of housing to be developed.

Looking at the critical situation in Johor, many questions can be asked. It is not clear whether or not both the developers and local authorities are fully equipped with the knowledge of and the market signals; or do they just simply propose and approve housing development? They should have realized the significant of demographic trends in Johor Bahru which in turn may have given a different scenario of the future housing market. Based on Table 2, the total residential properties in Johor Bahru are more than the current housing needs based on the number of households (Bujang, 2006). Consequently, it has led to the property overhang due to the unsold and exceeding numbers of housing in the market.

Table 2 clearly shows residential property over supply Johor Bahru. the total residential property exceeding the household number. Even though the total population has shown growth, the level of income and employment has remained static facing. Moreover, presently people prefer new housing schemes, which give better design and quality, compare to old ones. This trend is definitely not helping at all the existing property overhang. Therefore, the study of demographic

pattern should be highlighted and need to be carried out by developers, local authorities as well as the property consultants in order to reduce over supply of residential property in the market and to ensure the effectiveness of housing planning in urban area.

3.0 METHODOLOGY

This research is conducted to study people preferences in acquiring a house based on affordability including the type of houses, price, income, and job sector. Figure 1 below shows the operational framework of the study.

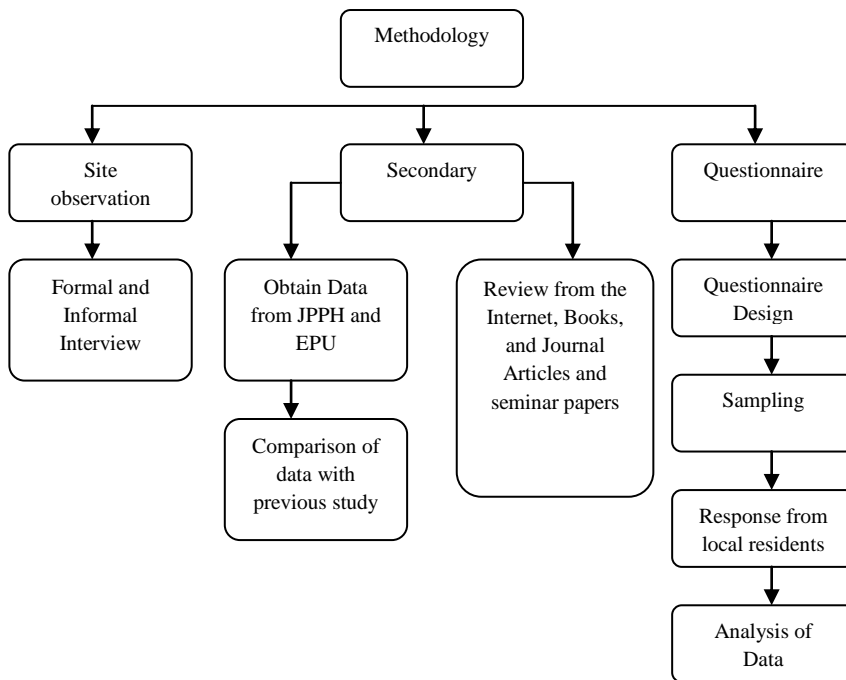


Figure 1: The Study Procedure

Secondary data have been collected from various working papers and government reports especially Malaysia Census and Property Market Report from year 1985 to 2007. Selected demographic features have been recorded in this research like population, household income, education, age, and others, that have interrelation with property market in Malaysia and Johor Bahru on the whole. Primary data were collected by using questionnaires and through interviews to evaluate people perspective regarding to the

housing issue and to determine their level of affordability.

The respondents comprised individuals of various income levels, i.e. lower, middle and high income both from public and private sectors. The reason for this strategy was to acquire different opinion regarding affordable housing within their areas. Yamane Formula (1973) was used to calculate the sample for the analysis. In this calculation the degree of confidence is at 90 percent of the total population of 1,265,335. This means that the minimum respondents needed is 100. However, 200 set of questionnaires were distributed and 183 were returned.

The researchers used Statistical Package for Social Science software (SPSS) to analyse the obtained data. Frequency analysis, Likert scaling and Cross tabulation analysis were used for the purpose. Pearson Chi Square analysis and Bivariate Correlation analysis were also used to determine the significant relationships among the demographics and factors that contribute in determining the level of house-buyers' affordability. In other words, the Pearson Chi Square Analysis was used

to measure the effectiveness and significant value of data for the purpose of analysis. Bivariate Correlation Analysis, however, was used to determine the coefficient correlation to measure the strength of association between two variables.

The study focuses on locations falling within the jurisdiction of local authorities in the district of Johor Bahru, namely, Johor Bahru City Council (JBCC), Johor Bahru Tengah Municipal Council (JBTCM), Kulai Municipal Council (KuMC), Pasir Gudang Local Authority (PGLA), and Johor Bahru District Local Planning Authority (JBDLPA), based on Year 2000 census.

4.0 DATA ANALYSIS AND FINDINGS

The questionnaires survey was divided into 5 parts and analyzed using the above mention approaches. Table 3 shows the total monthly income among the respondents. Table 4 and 5 below show the types and housing price based on the opinion of 183 of respondents who preferred such houses to buy, as they considered them to be affordable:

Table 3 shows that most of the respondents' total monthly income is less than RM3, 000 per month.

Table 3: Total monthly income

Total Monthly Income	Frequency	Percent
Less than RM1,000	6	3.3
RM1,001 – RM1,500	44	24.0
RM1,501 – RM3,000	101	55.2
RM3,001 and above	32	17.5
Total	183	100

As shown in Table 4, most of the respondents considered affordable housing price to be below RM150, 000. This table also shows that the higher the income earned by respondents the higher the probability to purchase a house with a higher price. This is perhaps viewed as to reflect their wealth and affordability level. For example respondents who earned RM3, 000 and above preferred to buy a house with the price of RM200, 000 and above. Meanwhile, other respondents whose income was below RM3, 000 preferred to acquire a house within the range of RM50, 000 to RM150, 000.

Table 5 shows the types of housing preferred by the respondents based on their income level. Most respondents choose either single or double storey terrace house. Only a few of them choose semi-detached, detached, apartment or condominium. However, there were also respondents who choose low cost flat; most of

Table 4: Relationship between monthly income and affordable housing prices

Monthly Income	Affordable Housing Price					Total
	Less than RM50,000	RM50,001 - RM100,000	RM100,001 - RM150,000	RM150,001 - RM200,000	RM200,001 and above	
less RM1,000	3	0	3	0	0	6
RM 1,001-RM1,500	5	21	13	4	1	44
RM1,501-RM3,000	5	29	48	14	5	101
RM3,001 and above	2	5	11	5	9	32
Total	15	55	75	23	15	183

Table 5: Relationship between Monthly Income and Type of House Preferences

Monthly income	Types of Housing						Total
	1 ST Terrace	2 ST Terrace	Semi-D	Detached	Apartment/Condo	Low Cost Flat	
less RM1,000	2	1	0	0	0	3	6
RM 1,001 to RM1,500	13	16	1	1	3	10	44
RM1,501 to RM3,000	36	41	3	6	4	11	101
RM3,001 and above	5	14	5	3	3	2	32
	56	72	9	10	3	2	183

this group earned a monthly income below RM3,000. Thus, it clearly indicates that there was strong relationship between household incomes and the type of a property, meaning those with high income might buy a property with higher price, while with lower income they might buy a house with low price in future.

Pearson Chi-Square and Correlation analysis had been carried out to test the relationship between demographic factors and the level of affordability in acquiring property in Johor Bahru. Table 5 shows the results of the analysis. Table 6 shows the results from Pearson’s Chi-Square analysis on nine types of demographic factors based on 183 of respondent’s socio economic background. The findings of Pearson’s Chi-Square test is used to discover whether or not the differences between the group frequencies are likely due to chance alone, and also to determine whether or not the variables of demographic factors and affordable housing price are associated with one another.

demographic factors are marital status, level of education, monthly income and the number of households.

Bivariate Correlation Analysis is also used to find which variables of demographic factors have strong correlation with affordable housing price. This test also shows that marital status, education level, monthly income and number of household have significant relationship with affordable housing price among the respondents. The analysis points out that education level among the respondents is highly correlated with the level of affordable housing price, because it stands at 0.401 and 0.00 as its level of significant. These results can be interpreted as to show that the higher the education level is the higher level of housing affordability.

It was also found that monthly income earned by the respondents denoted high correlation. The analysis shows that the more income earned by the people the better house they will afford to buy. The test also denoted that income also has

Table 6: Summary of Analysis on Demographic Factors and Affordable Housing by Using Pearson Chi-Square Test

Demographic Factor	Analysis	Value	Degree of freedom	Asymp. Sig. (2-sided)
Gender	Pearson Chi-Square	4.633(a)	4	.327
Race	Pearson Chi-Square	7.506(a)	8	.483
Age	Pearson Chi-Square	11.733(a)	8	.164
Marital Status	Pearson Chi-Square	11.006(a)	4	.026
Education Level	Pearson Chi-Square	43.775(a)	12	.000
Job sector	Pearson Chi-Square	11.921(a)	8	.155
Status of Job	Pearson Chi-Square	9.312(a)	8	.317
Monthly Income	Pearson Chi-Square	47.077(a)	12	.000
Number of Household	Pearson Chi-Square	30.492(a)	12	.002

Tasir and Abu (2003) cited that, the significant value by Pearson Chi-Square analysis must be less than 0.05. Our analysis indicated that only selected demographic factors have significant relationship with affordable housing price. These

relationship with educational level of the respondents. The degree of coefficient correlation between these two variables was at 0.547 that is to say respondents who have better education would in turn have better earnings.

Table 7: Summary of Bivariate Correlation Analysis						
		Affordable housing Price	Marital status	Education	Monthly Income	Size of a Household
Affordable housing Price	Pearson Correlation	1	-.166(*)	.401(**)	.343(**)	.157(*)
	Sig. (2-tailed)		.025	.000	.000	.033
	N	183	183	183	183	183
Marital status	Pearson Correlation	-.166(*)	1	.028	-.221(**)	-.447(**)
	Sig. (2-tailed)	.025		.704	.003	.000
	N	183	183	183	183	183
Education	Pearson Correlation	.401(**)	.028	1	.547(**)	-.030
	Sig. (2-tailed)	.000	.704		.000	.683
	N	183	183	183	183	183
Monthly Income	Pearson Correlation	.343(**)	-.221(**)	.547(**)	1	.197(**)
	Sig. (2-tailed)	.000	.003	.000		.007
	N	183	183	183	183	183
Size of a Households	Pearson Correlation	.157(*)	-.447(**)	-.030	.197(**)	1
	Sig. (2-tailed)	.033	.000	.683	.007	
	N	183	183	183	183	183

The analysis also shows the number of income earners in a household as a factor having positive correlation at 0.157 and the significant level is 0.033 with the affordable housing price. This positive correlation means that a bigger number of income earners in a household will result in a better affordable housing. Masri (2003) coefficient correlation with less than 0.3 shows those variables do not have strong correlation with each other.

The last finding in this coefficient correlation analysis is the relationship between marital status and affordable housing price. Table 6 shows the correlation value is at -0.166 and the significant level is 0.025 respectively. The negative value in this correlation claims that when a person entered into married life the housing affordability price will be less. This is due to the possibility that the increase in the number of household dependents may cause more income to be spent on them. These possibilities will in turn decrease their affordability in buying a property having higher level of price that they may choose to acquire.

5.0 CONCLUSION

The result of the findings shows the importance of studying the relationship between demographic factors and housing affordability. Different demographic backgrounds of respondents may influence the different level of housing affordability. We found that the average income earned by most of the respondents in Johor Bahru is less than RM3, 000 per month, which is considered low compared with other big cities such as Kuala Lumpur and Selangor. This study also finds and confirms that the affordable housing price within the study area is RM150, 000 and below, as stated by Bujang (2006). Thus, the types of housing preferred by most of the respondents are terrace units covering single and double storey houses. However, the results also indicated that not all of demographic factors influenced the demand on housing and the level of affordability in housing price. Only marital status, numbers of households, monthly income

and education level have strong relationship with affordable housing price.

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