

RESIDUAL INCOME MEASURE OF HOUSING AFFORDABILITY

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ABSTRACT

Housing affordability is an indicator of householder's ability to own a house. While residual income measure is a popular measurement of housing affordability. Every measurement has its own criteria and elements that make it different from another. The objective of this research is to examine the residual income measure of housing affordability as well as to examine the variables that affect low-cost homeownership amongst the low-income group in Kuala Lumpur. In order to measure the housing affordability of an individual, the focus is generally on his/her income. If the income is adequate to pay for a house and other essentials as well as to obtain other market services, then the individual concerned possesses home affordability. The sample of this research comprised 300 individuals who owned low-cost houses at Kuala Lumpur City Hall. A systematic sampling technique was used in this research. This research also used binary logistic regression as an analytical tool. The findings of this research indicate that residual income measure suitably measures the housing affordability of low-income groups in Kuala Lumpur. The main variables that affect affordability include household income, household expenditure, type of occupation, education level, working household and monthly payments for housing. The only variable that does not affect the ability of low-income earners to own a low-cost house in Kuala Lumpur is having children.

KEYWORDS: *Housing affordability; Housing measurement; Low-cost housing; Binary logistic regression*

I. INTRODUCTION

Housing is a basic need that protects us from the elements keeps us safe, and gives us privacy and personal comfort. Housing affordability is not easy to determine and identify. Various approaches and methods have been adopted by previous researchers in their efforts to determine housing affordability, (i.e. the financial capacity to pay off the costs involved in being able to occupy a housing unit).

The national housing policy stipulates that everyone should own a house be they from high, medium or low-income groups irrespective of ethnicity. From these earlier studies, four types of measurement of housing affordability emerged such as Price to Income Ratio (PIR), Rent to Income Ratio (RIR), Housing Expenditure to Income Ratio, and Residual Income Measure. Normally, to determine whether someone can afford to own a house or not, means looking at their expenses; where after paying for basic necessities, residual income exists to purchase other things. In this situation, they are considered as capable of owning a house [1]. However, if they are unable to pay monthly housing installments and have insufficient money to purchase other things, then they are considered as incapable of owning a house. As such it is important to know the measurement of housing affordability. This paper will discuss the residual income measure of housing affordability in Malaysia. The organization of manuscript was theoretical framework of housing affordability, methodology, result and discussion; and the conclusion of this research.

II. THEORETICAL FRAMEWORK

The concept of housing affordability refers to the ability of a household to pay for a house. [2], observes that the housing affordability concept pertains to the amount of income needed to pay for a house and other household expenditures [3]. This concept was used in the United Kingdom and the United States in 1960 and 1980 respectively with different policy objectives [4]. Affordability is concerned with securing a given standard of housing (or different standards) at a price or a rent that does not impose, in the eyes of a third party (usually the government) an unreasonable burden on that household's incomes [5]. Housing affordability as the capacity of a household to be able to occupy a housing unit that meets well-established (social sector) norms of adequacy (given household type and size) at a net rent which leaves the household concerned with enough income to live on without falling below a poverty standard. It can therefore be concluded that housing affordability means being able pay a mortgage and still have residual income to buy other things [1]. Therefore, knowledge about the factors that shape housing affordability allows us to measure the affordability of low-cost housing [6;7;8].

The National Housing Department has determined that the sale price of a low-cost housing unit is RM25,000 maximum; for all types of homes built in a low-cost housing scheme. The price is still considered poor families cannot afford to own a house [9]. This is because the computed ability to buy a low-cost home-based pre-conditioner does not take into account the actual situation of family's obligations. In addition, household spending does take into account the actual situation of family's obligations. The price of low-cost housing needs to reflect the financial ability of prospective buyers to purchase. In Malaysia, since 1982, the maximum price of low-cost housing is fixed at RM25,000 for lower income groups (i.e., those earning less than RM750 a month). In the process of providing low-cost housing, any changes in plans that reduce essential infrastructure and standards (in terms of design) need to ensure that construction costs can be as low as possible.

This ensures that the maximum price is both low and affordable for low-income earners. However, in order to find the most inexpensive method for producing low-cost housing, factors such as safety, durability and suitability cannot be ignored by developers and contractors; in order to not affect the quality of life of low income earning purchasers. For this reason, the government has increased the price of low-cost houses, from RM25,000 to RM28,000 per unit for all new projects. This price rise of RM3,000 covers infrastructure improvements, such as increased drainage facilities, environment and a better quality home. This rise was within the adjustments made by the federal government to set a maximum price of low-cost housing between RM25,000 and RM35,000 in rural areas and up to RM40,000 in urban areas. Based on these new specifications as set by the Ministry of Housing and Local Government, the price of low-cost housing units is now between RM25,000 and RM42,000. Pricing depends on location and the area within which the low-cost houses are built. For low-cost houses built in cities and large towns, units are priced at RM42,000. While for low-cost houses built in large cities and large suburbs, units are priced at RM35,000. In contrast, low-cost houses built in small towns and suburbs, units are priced at RM30,000. For low-cost houses built in rural areas, the price of a unit as designated by the Ministry of Housing and Local Government is RM25,000 which is the lowest price given to low-income earners to own a house. These units can only be sold to low-income earners whose monthly income is between RM750 to RM1,500. Low-cost houses are categorized as terraced, clustered, flats and townhouses [10].

Housing affordability is not easy to determine and measure. Previous researchers have used many methods to determine and define it. Residual income measure can reflect someone's ability to own a house [11]. It often serves as an alternative method to measure housing affordability [4;12]. [13], suggests that residual income measure is suitable to gauge unaffordable households. This method was also used by [14], in his study of house owners in Switzerland. From the above explanations we understood that residual income measure was often used by previous researchers to examine housing affordability. Therefore, this research also uses residual income measure to examine housing affordability with the objective of examining the variables that affect low-cost homeownership amongst the low-income group in Kuala Lumpur. This study utilizes three variables to examine the housing affordability of low-cost house owners in Kuala Lumpur namely, household income, household expenditure, and monthly payments for housing.

2.1 Methodology

The housing policy in Malaysia requires that 30% of all housing developments should be for low-cost housing. Most of the new housing estates are built with medium and high-cost houses. As such, this study focuses on the housing affordability of low-cost housing provided by Kuala Lumpur City Hall. Kuala Lumpur was chosen for this case study owing to a shortage of research funds and time.

A questionnaire method was used to collate the primary data from a group of selected respondents. This method was chosen as it ensures a high rate of response. The questionnaire was in the form of structured questions. To avoid any bias in responses, the language used was direct, simple and familiar to the respondents. The level of housing affordability was measured at two levels: "1" for affordable and "0" for unaffordable. A sample of 300 respondents was systematically selected from 1,920 low-cost housing units in Kuala Lumpur. The questionnaires were administered and collected between March and May 2006. The sampling frame was based on the total number of low-cost housing units sold since 1990. Data was analysed using binary logistic regression and descriptive statistics. For latter generated frequencies and percentages of respondent's characteristics; whilst the former identified the principal components of housing affordability.

2.2 Results and discussion

The aim of this study, as stated earlier, is to examine the residual income measure of housing affordability and the variables that affect low-cost home ownership amongst the low-income group in Kuala Lumpur. The following includes the results and discussion in the statistics with background information, followed by binary logistic regression for housing affordability level, and basic descriptive statistics for the variables that affect low-cost home ownership.

2.3 Respondents' background

Low-cost houses provided by Kuala Lumpur City Hall are comprised of four zones i.e., Zone 1 (340 units), Zone 2 (196 units), Zone 3 (384 units) and Zone 4 (1,000 units). Zone 1 units are freely allocated by Kuala Lumpur City Hall to villagers, while Zones 2, 3 and 4 are sold to the low-income group. A single area in each zone was chosen as a study area. This selection was based on a higher number of buyers in each zone. Respondents from Zone 2 were from Vista Angkasa (Block 2), Zone 3 from Sri Pangkor 1 (Blocks 166 and 168), and Zone 4 were from modern flats (Phase 3B). In terms of the ethnic background of residents, most house owners in the low-cost houses were Malays whilst a smaller number consisted of Chinese and Indians. The average household size was three to four persons per house. This indicates a reasonable level of average monthly household income of between RM750 to RM1,500.

2.4 Level of affordability

The level of affordability of the low-income group is 66% (as shown in Table 1). In contrast, 31.1% of the low-income group cannot afford to own a low-cost house even with the provision of subsidized housing.

Table 1: Affordability level

Affordability Level	Respondent	Percentage
Not affordable	96	31.1
Affordable	204	66.0
Total number of respondents	300	97.1
Total number of respondents undetected	9	2.9
Total of Respondents	309	100.0

2.5 Variables affecting low-cost home ownership

For household income variables, 59.2% of the low-income group receive an income between RM751 to RM1,500 per month (Table 2). In contrast, 19.4% of the low-income group receives an income of less than RM750 per month, while 18.4% receive an income of more than RM1,500 per month. This means that the total income for low-income group is both low and limited.

For household expenditure variables, 59.5% of the low-income group expend RM751 to RM1,500 per month. This shows that the low-income group whose income is RM751 to RM1,500 per month use all of their income on household expenditure, 24.6% spend less than RM750 per month, while 12.9%

spend more than RM1,500 per month. In other words, total expenditure is in direct correlation with income.

Types of work variables were identified according to three categories; as indicated by Types of Work (1), (2), (3). As shown in Table 3, 51.8% of the respondents were in Types of Work (1), a category whose education requirement is low. A total of 17.8% of the respondents were in Types of Work (2), while 27.5% were in Types of Work (3).

For the level of education variables, 40.1% had primary school education. This means that the low-income group has a low level of education, which is compatible with their types of work. Nevertheless, some had secondary school level education (33.7%), college education (2.9%) and university education (1.6%). The unschooled in the low-income group were comprised of 18.8%. This means that the low-income group was synonymous with low level education. Table 2 shows that most of the low-income group (94.5%) had at least one child, whilst 2.6% of the respondents had no children. When this low-income group bought their low-cost houses in Kuala Lumpur, the number of children in their families was one or two.

Table 2: Variables affecting low-cost home ownership

No.	Variables	Items	Respondent	Percentage
1.	Household Income	Less than RM750	60	19.4
		RM751-RM1,500	183	59.2
		More than RM1,500	57	18.4
2.	Household Expenditure	Less than RM750	76	24.6
		RM751-RM1,500	184	59.5
		More than RM1,500	40	12.9
3.	Types of Work	Type of work (1) (Administration, management and technical service)	55	17.8
		Type of work (2) (Clerical services, selling, sales service, operator)	160	51.8
		Type of work (3) (Pensioner and housewife)	85	27.5
4.	Level of Education	University	5	1.6
		College	9	2.9
		Secondary School	104	33.7
		Primary School	124	40.1
		Unschooled	58	18.8
5.	Having Children	None	8	2.6
		With Children	292	94.5
6.	Working Members	Husband (1)	230	74.4
		Wife (2)	35	11.3
		Husband and Wife (3)	35	11.3
7.	House Instalment	RM100-RM200	212	68.6
		RM201-RM300	50	16.2
		RM301 and above	38	12.3
	Total number of respondents		300	97.1
	Total number of respondents undetected		9	2.9
	TOTAL OF RESPONDENT		309	100.0

Working households consisted of three categories i.e., Category (1) husband, Category (2) wife, and Category (3) husband and wife. The results listed in Table 3 show that 74.4% of the husbands had part-time work, while the combination of husband and wife with paying jobs was 11.3%. This shows that most household's husbands had part-time work. Most of the low-income respondents paid

housing installments of RM100 to RM200 per month (68.6%), while 16.2% paid RM201 to RM300 per month, and 12.3% paid RM301 and more.

Three tests were performed to identify the affected and unaffected variables that influence the ability of low income earners to own a low-cost house in Kuala Lumpur, namely odds ratio, significance level, and omnibus tests. These tests sought to examine the variables that affect low-cost homeownership amongst the low-income group in Kuala Lumpur. Odds ratio is independent variable value. If the odds ratio is less than 1, there is a decrease in the odd's value. This means that the variable does not affect affordability to own a house. If the odds ratio exceeds 1, there are is an increase in the odd's value. This means that the variable affects affordability to own a house. If the odds ratio is 1, this shows that the independent variable does not affect the dependent variable. Based on the results shown in Table 3 variables not affecting the affordability to own a house are level of education, working wife, and working husband and wife; because the odds ratios shown are less than 1. Meanwhile, variables affecting house ownership are household income, household expenditure, types of work (1), types of work (2), types of work (3), having children and the variable of monthly payment for a house. This is because these variables have odds values that exceed 1.

Table 3: Odds Ratio

VARIABLES	ODDS RATIO
Household Income	1.005
Household Expenditure	1.004
Type of work (1) (Administration, management and technical service)	11.345
Type of work (2) (Clerical services, selling, sales service, operator)	11.345
Type of work (3) (Pensioner and housewife)	7.724
Education Level	0.583
Having a Child	1.284
Working husband	0.154
Working wife	0.154
Husband & wife are working	0.013
Monthly payment for house	1.461

Indicator :

Affect Variables = odds value > 1.

Not Affected Variables = odds value < 1.

If the value of significance level is less than 0.05, it shows that the value derivative from that sample represents the real population's value. Instead, if the value exceeds 0.05, it shows that the value derivative from the stated sample is not representative of the real value in that population. Table 4 shows that there are six variables affecting affordability to own a house, namely household income, household expenditure, types of work, level of education, working household and the variable of monthly payment for a house. Nevertheless, there is one variable that does not affect affordability to own a house namely having a child. This is because the significance level for this variable exceeds 0.05 (as 0.736).

Table 4: Significance Level

VARIABLE	SIGNIFICANCE LEVEL
Household Income	0.000
Household Expenditure	0.000
Type of work (1) (Administration, management and technical service)	0.000
Type of work (2) (Clerical services, selling, sales service, operator)	0.000
Type of work (3) (Pensioner and housewife)	0.000
Education Level	0.001

Having a Child	0.736
Working husband	0.000
Working wife	0.012
Husband & wife are working	0.000
Monthly payment for house	0.049

Indicator :

Affect Variables = < 0.05.

Not Affected Variables = > 0.05.

For the omnibus test, if the value is less than 0.05 it shows that the variable must be taken into account and included in the equation. However, if the value exceeds 0.05, it shows that the stated variable should not be considered or included in the equation. The omnibus test shows that having a child is a variable that does not affect affordability to own a low-cost house in Kuala Lumpur. This is because the significance level of this variable exceeds 0.05 (as shown in Table 5- to as much as 0.739). Although there were differences in the results of the 3 tests, this study uses the results from the significance level and omnibus tests. This is because the significance level has been used by previous researchers in their analyses.

Table 5: Omnibus Test

VARIABLE	OMNIBUS TEST
Household Income	0.000
Household Expenditure	0.000
Type of work (1) (Administration, management and technical service)	0.000
Type of work (2) (Clerical services, selling, sales service, operator)	0.000
Type of work (3) (Pensioner and housewife)	0.000
Education Level	0.000
Having a Child	0.739
Working husband	0.000
Working wife	0.000
Husband & wife are working	0.000
Monthly payment for house	0.041

Indicator :

Affect Variables = < 0.05.

Not Affected Variables = > 0.05.

III. CONCLUSION

This research proves that residual income measure is a more suitable and easy method to measure housing affordability. It shows that the objective of this research is achieved. It also proves that respondents can afford to buy a house provided by the government. This means that the price of low-cost houses (at RM22,000 to RM25,000 per unit) is affordable to the low-income group. Other variables that affect affordability include types of occupation, level of education, number of working household members and the amount of monthly property installments. In this regard, this research finds that despite earning a monthly income of RM300 to RM1,200, the low-income group can afford to pay their monthly installment of less than RM250 and still have residual income to spend on other household necessities [15]. This is different with [16] that using minimum budget standards-excluding housing-that allow for decent participation in society. This analysis shows various factors. Firstly, the low-income groups in Kuala Lumpur can afford to own a low-cost house. This shows that the government's housing policy which encourages every citizen to own a house is realistic. Nevertheless, there are still some low-income groups who cannot afford to own a low-cost house in Kuala Lumpur. However, the government needs to take house prices into account. Prices should not be increased but should be maintained at RM25,000 per unit. This is because house price determines the affordability

of low-income groups to own a low-cost house in Kuala Lumpur. With low-income and low levels of education, this group must plan their expenditure very carefully in order to pay their instalments and spend on necessities. Thirdly, the government needs to take into account contingencies such as any increase in the cost of living due to increases in oil prices; which subsequently affects the price of goods. If house prices increase, but the level of income for low-income groups remains the same, this will result in this group being unable to purchase a house. The aim of government policy in each Five Year Malaysia Plan is to ensure that low-income groups can afford to buy low-cost houses provided for them.

IV. FUTURE WORK

Recommendations for future work is to review the ability of high-income group and middle income group to own a house in Kuala Lumpur or in other states by using residual income measure. Other than that, it is suggested that future work more focus on variables other than the six variables that were examined in this study. Among the variables that can be studied are variable of housing subsidies, home prices, gender, race and so on. As the outcome of [17] in the study reveals that considering a range of social and environmental criteria can greatly affect the calculation of areas affordability, in comparison to focusing solely on financial attributes. COPRAS was found to be an effective method for the assessment and could be applied in other regions or internationally. With the availability of advanced study, it will be able to increase knowledge and information on topics and areas of study that are not examined in this research.

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