



# Measuring Housing Affordability Through Residual Income Approach as a Parameter in Some Selected Houses Developed Within FCT, Abuja

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**Abstract:** This study aims to measure the affordability of houses provided by the organised housing developers in the FCT, Abuja, to know if it is affordable for low-income earners by taking into consideration certain variables that may have an effect on the affordability, which range from "household income, household expenditure, occupation, educational qualification, number of households with children, number of household heads working, and monthly house installment. The study uses quantitative research approaches. The study employed both primary and secondary data with the aid of questionnaires. A total of 330 low-income earners were selected in the FCT based on the proportion of the estimated household population using a systematic sampling technique. The information gathered was analysed using descriptive statistics, frequencies, percentages, and binary logistic regression analysis. The findings revealed that 60.6% of the respondents among the low income earners earned somewhere between the range of ₦61,000 and ₦90,000. The finding of the level of affordability revealed that only 30.4% of the sampled respondents could afford the housing provided, compared to 69.6% who were not capable of affording it. The result revealed that among all the variables considered, the only educational qualification variable that has no effect on affordability among the low income earners in the FCT, Abuja. Therefore, the analysis has shown the loopholes in the current housing policy where the major target is to provide houses that are more affordable for every class of citizen, with a focus on low-income earners. In view of the findings and conclusions of this study, the following recommendations were made: The government needs a total overhaul of the current housing policy in order to create an enabling environment where the cost of housing can be reduced and income generation can be equally increased, so that low-income earners can conveniently afford the houses provided within the FCT, Abuja and other parts of the country at large.

**Keywords:** Affordability, Housing, Residual Income, Development

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## 1. Introduction

The idea of affordable housing has been a contemporary issue in housing policy arguments for quite a while. In developed nations, particularly in the UK and US, affordable housing recovered cash over the most recent two decades when concerns were elevated by the developing number of destitute, rising rent-to-pay or home loan-to-wage proportions for lower and middle-income households. As indicated by Karley in 2009, affordability became an issue in

housing as nations moved towards a more market-based housing sector. In developing nations, affordable housing is also picking up money, particularly amidst rising housing prices and slum creation [8, 9].

There are several definitions of housing affordability; however, due to the idea's ambiguity, the exact definition is best-case scenario equivocal. The traditional indicator of affordable housing is the rate of income spent on housing. This has generally been 30%. In the US, housing expenses that exceed 30% of household income have generally been

seen as an indicator of an affordable housing issue [1, 6, 7].

Various works on the definition of affordable housing have attempted to characterise affordability in terms of residual income or parts of a salary that remain after housing costs have been met, as well as whether a single person or family can approach a specific end goal of buying a house. and Williams noticed that "affordability" involves achieving some given standard of housing at a given cost or a lease that does not force a preposterous weight on the family's salaries and wages [2]. Likewise, in 1990, Bramley characterised affordable housing as "those family units which ought to have the capacity to own housing that meets a minimum standard at a net lease that makes them have enough salary to live on without falling beneath some poverty or destitute level."

This implies a household is "poor in shelter" in the event that it can't meet its non-housing needs at some base level of its sufficient in the wake of paying for housing costs [14]. That is, poverty of shelter is a type of poverty that is an outcome of the press on livelihoods and housing costs instead of simply restricted wages. On this premise, even if a family unit or household would even now be unable to meet its non-housing needs if the cost of shelter were diminished to zero, it ought to be viewed as outright poverty as opposed to shelter poverty, the last circumstance being Hancock's minimal meaning of affordability [14].

Residual income is the salary or wages that a family unit or household has left over after paying for housing. It presents a more precise picture of affordability than the value of salary proportions provided, because it believes that lower-income family units or households are only willing to manage the cost of small ratios of their salary on housing

without experiencing any difficulties or inconveniences. One method for building up the extra cash a family unit or household has is to reduce the remaining salary as residual income by the sum they are expected to require for fundamental or basic family needs [13].

Therefore, it is pertinent to measure the level of affordability of a household after the basic things have been taken care of. So, this research work would adopt the approach of residual income to measure the affordability of housing in the Federal Capital Territory of Abuja. The sequence of this research started with an introduction, a literature review on housing affordability, methodology, results and discussion, conclusion, and finally recommendation and future research suggestions.

## 2. Literature Review

For a house to be reasonable in terms of its affordability, the salary or income should not, on a fundamental level, fall under ISAM, regardless of the possibility that wage support is the main wage, and in this way, the remaining wage (residual income) ought to dependably be more prominent or greater than zero. The greater the leftover wage (residual income), the more housing can be afforded in the feeling of having some wage left over to purchase different things. In a case where the remaining wage (residual income) is minus (-) or negative (-), then there is a significant issue of affordability.

Residual income: A housing expense is the remainder of income after households have settled the essential non-housing prices [3, 14, 16].

$$\text{Residual Income} = \text{Income} - \text{Rent} - \text{Income Support Applicable Amount (ISAM)} + \text{Housing Benefit}$$

The affordability gap is the difference between the price of a home and what most people can afford to pay. Housing prices are usually derived from the market, while what people can afford to pay is usually derived from their household income, the cost of servicing the mortgage, and a guideline that suggests no more than 30% of the household income should be spent on housing costs.

According to Ukoje [15], the total number of houses delivered was a total of 4,158 houses, from a whopping 15,301.69Ha of land allocated to 360 developers across FCT toward achieving adequate and affordable housing for the masses, dominated by low-income earners. The Federal Government recognises the fact that provision of adequate housing is a national challenge and is worst off in Abuja with over three hundred thousand career civil servants alone. Experts have argued that only 30% of the housing needed has been provided by the fact that 113 developers out of the 360 organised private sectors who were allocated land for housing development in the scheme have since its inception mobilised effectively to sites to achieve the stated goal or part of it.

From Ukoje's conclusion, only 4,158 units were constructed by the developers. This stands at 11.66% of the total units of housing expected to be delivered. The deficit of 31,700 units (86.62%) was yet to be realized. With the aid of this shortfall

in the delivery process, the houses produced are yet to be affordable to the low-income earners whose minimum wage stands at the current minimum wage of ₦30,000.00 per month. The organised housing developers' scheme was meant to provide an affordable housing programme targeting low and medium-income earners as the sole beneficiaries. The agreement that the housing should be built at an affordable cost was the target of the federal government and was realised by the developers as the provision and release of land was made without any cost to the organised housing developers. In a nutshell, the type and cost per different unit of house realised are shown in Table 1 below.

**Table 1.** Type and Cost of Different Units of Houses.

S/No.	Type	Cost (₦ million)
1	Two Bedroom Semi-Detached Bungalows	12 -19
2	Three Bedroom Detached Bungalows	20 -28
3	Four Bedroom Detached Bungalows	25 -32
4	Five Bedroom Bungalows	68 and above

Source: Extracted from [15] as modified by the researcher.

This range of prices presents the means of fulfilling the stated goals of the policy approach in organising housing developers to provide affordable housing, which is agreed upon by the

partners at the initial stage of the agreement of all the actors involved, i.e., both the government and private sectors [3]. As such, the process of computing and justifying housing affordability is always cumbersome because many researchers have previously used many approaches to come up with an acceptable way of identifying it. So, for the residual income approach, it has the absolute capacity to justify the length of practical consumption measures which can be created. Regardless, despite everything, it suffers from a large number of indistinguishable constraints from other current measures [4]. An income approach usually reflects a person's ability to acquire a house. It usually serves as an alternative parameter to measure affordable housing. The above explanations show that the residual income approach was usually used by previous researchers to measure housing affordability. So, this study also uses the residual income method to show that housing is affordable. Its goal is to look at factors that affect low-income earners' ability to own a home in the FCT, Abuja.

### 3. Methodology

The National Housing Policy (NHP, 2006) [4, 5] was put in place by the government to aid low-cost housing in the FCT and other parts of the country, but the actors who benefited more from the little ones, it is realized, are within the high class, and the competition makes it unaffordable for the low-income group. Therefore, this research will concentrate on the affordability of low-cost housing provided by organised housing developers. And the scope will be limited to Abuja as a case study area. A primary source of data was adopted through administering questionnaires to groups of respondents, which made the research more tentative with a high rate of quality and transparency from the participants. So, the questionnaires were structured in order to avoid some kind of bias from the respondents by asking simple and straight-forward questions. From the residual income approach, the level of affordability for housing was measured with two different levels, i.e., (1) = affordable while (0) = unaffordable. A total of 330 questionnaires were distributed to respondents, which were selected systematically from the 2,240 low-cost housing units realised by the organised housing developers. Out of the total number of questionnaires distributed, 312 were retrieved, while 18 failed to return their own among the respondents. A sample frame was chosen from the total number of low-cost housing units among the total number of 4,158 housing units realised by the organised housing developers. The analysis was done by the use of binary logistic regression as well as the descriptive statistics method. The second one was used to generate percentages and frequencies from respondents' characteristics, while the first one was used to identify the principal components that have an effect on housing affordability.

### 4. Results and Discussion

The major aim of this research is to measure housing affordability through a residual income approach in some selected houses that have been built by organised housing

developers. And also, some of the variables that have an effect on low-cost housing ownership among the low-income group in the FCT, Abuja, will be equally examined. The results and discussion of the following will include the statistics with background information, as well as binary logistic regression of housing affordability level with basic descriptive statistics representation of variables that have an effect on low-cost housing ownership.

#### 4.1. Respondents' Background

The range of prices in Table 1 shows that the wheel of fulfilling the stated goals of the policy approach of organised housing developers in providing affordable housing, which was agreed upon by the partners at the initial stage of the agreement, cannot be realistic based on what has been achieved so far. However, this shows that before a civil servant can own the lowest cost of housing provided, which stands at the tune of ₦12,000,000, by saving 30% of his/her salary with the current monthly minimum wage of ₦30,000, research stands to measure how affordable it can be. This implies that the houses provided may be unavailable to the low-income earners who are supposed to be the major target of the programme instead of the high-income earners. Therefore, the respondents were selected across the four (4) phases of Abuja among the low-income earners where the questionnaires were distributed evenly. From the questionnaires administered and retrieved, it can be deduced that the average household size stands at 2–6 people per household. This represents a desired level of average monthly household income of between ₦30,000 and ₦120,000 and above.

#### 4.2. Level of Affordability

From Table 2 below, it can simply be deduced that the level of affordability according to the respondents who participated is as follows: the low-income group who can afford the houses provided is 30.4%, while those of the low-income group who are not capable of affording them are 69.6%, as shown.

*Table 2. Affordability level of Respondents.*

Affordability Level	Respondents	Percentage (%)
Affordable	95	30.4
Not Affordable	217	69.6
Total No. of respondents who participated	312	94.5
Total No. of respondents not participated	18	5.5
Total of Respondents	330	100.0

#### 4.3. Some of the Variables That Have Effect on Low-Income Housing Ownership

In analysing various variables that have an effect on low-income housing ownership, some of the variables considered ranged from "household income, household expenditures, occupation, educational qualification, household with children, head of household working, and monthly house instalment from the total number of 312 respondents who participated.

The analysis presented in Table 3, shows that in the household income variable, 60.6% of the respondents among

the low income earners earned between the range of ₦61,000-90,000 and 32.7% earned between ₦91,000-120,000 and above, while 6.7% earned between ₦30,000-60,000, which is the least in income among the respondents. The inference on household income shows that low-income earners receive a low income and have limited purchasing power.

The second variable is household expenditures, with 71.2% of respondents spending between ₦61,000 and

₦90,000 on household expenses each month, 17.9% spending between ₦30,000 and ₦60,000, and 10.9% spending between ₦91,000 and ₦120,000 or more. The inference on household expenditure shows that some of the respondents may have nothing left from their income to give them the ability to purchase the low-income houses provided by organised housing developers because household expenditure is directly proportional to household income.

*Table 3. Variables with effect of low-income housing ownership.*

No.	Variables	Items in Range	Respondent	Percentage (%)
1.	Household Income	₦30,000-₦60,000	21	6.7
		₦61,000-₦90,000	189	60.6
		₦91,000-₦120,000 & above	102	32.7
2.	Household Expenditure	₦30,000-₦60,000	56	17.9
		₦61,000-₦90,000	222	71.2
		₦91,000-₦120,000 & above	34	10.9
3.	Occupation	Category A Administration, management and technical service	177	56.7
		Category B Trading, Business, Clerical services, operators	92	29.5
		Category C Pensioner and housewife	43	13.8
4.	Educational Qualification	University	7	2.2
		College/ND/HND	11	3.5
		Secondary Certificate	154	49.4
		Primary Certificate	58	18.6
		None	82	26.3
5.	Household with Children	With Children	298	95.5
		None	14	4.5
6.	Head of Household Working	Only Husband	256	82.0
		Only Wife	8	2.6
		Husband and Wife	48	15.4
7.	House Installment	₦18,000-₦27,000	206	66.0
		₦28,000-₦36,000	62	19.9
		₦37,000 & above	44	14.1
	Total No. of respondent who participated		312	94.5
	Total No. of respondents not participated		18	5.5
	Total of Respondent		330	100

The third variable is the occupation of the household head, which is categorised into A, B, and C due to their numbers and relationships. 56.7% of the respondents fall under category A, and 29.5% fall under category B, while 13.8% fall under category C. The inference on the occupation of respondents is not far from their characteristics, as low-income earners usually don't acquire higher levels of education, as it will be analysed in the next variable (Educational Qualification).

The fourth variable is educational qualification. Of the respondents, 49.4% attained a secondary school certificate, followed by 26.3%, which is the highest, did not acquire any formal certificates. Then 18.6% attained primary school certificates and 3.2% attained college/ND/HND while 2.2% attained a degree certificate. Generally, low-income earners are characterised by low educational qualifications.

Next is the number of children per household. Almost each of the households possesses children ranging from 1-4, i.e., at least 95.5% of the households have a child, while 4.5% of the households have no children. Then the sixth is the household head who is working. The household where only the husband is working stands at 82.0%, and the one where only the wife is working stands at 2.6%, while the household where both the husband and wife are working stands at 15.4%. This shows that

households where husbands are the sole providers are the most disadvantaged, even compared to collective efforts.

Then the last is the house installment, which is equally divided into A, B, and C based on the range of the amount spent on housing each month from their income. Category A spent the least amount on housing, with 66.0% of respondents, and category B stood at 19.9%, while category C was at 14.1%, with the highest household installment.

After analysing each of the variables, several tests were performed to test and identify which of the variables has the ability to influence the purchasing power of low-income earners to afford housing in the FCT, Abuja based on their effectiveness. These tests are the Omnibus Test, Odds Ratio Test, and Significance Level Test of these variables. All of these tests were carried out in order to determine which of the variables has a direct effect on low-income housing ownership among low-income earners in the Federal Capital Territory of Abuja.

Table 4 shows the Omnibus Test conducted. In the Omnibus test, if the value of any variable generated is less than 0.05, it is proved that such a variable must be taken into consideration and be part of the equation. Whereby, if any value generated is greater than 0.05, it will amount to the fact that such a variable shouldn't be added or considered in the equation. The test proves that the type of educational

qualification attained is a variable which does not have an effect on the affordability of housing ownership for low-income earners in the FCT, Abuja. This is simply because the significance level of the occupational variable is 0.831, which is greater than 0.05 as presented in Table 4 below;

**Table 4.** The Values of Omnibus Test.

Variable	Omnibus Values
Household Income	0.000
Household Expenditures	0.000
Category A Occupation: Administration, management and technical service	0.001
Category B Occupation: Trading, Business, Clerical services, operators	0.000
Category C Occupation: Pensioner and housewife	0.002
Educational Qualification	0.831
Household with Children	0.021
Only Husband working	0.000
Only Wife working	0.000
Both Husband and Wife working	0.000
Monthly House Installment	0.030

Indicator:

Effective Variables is  $< 0.05$ .

Not Effective Variables is  $> 0.05$ .

From Table 5, the odds ratio test conducted is an independent variable value. In the odds ratio test, if it is less than 1, then there is a decrease in the odds value, which means that the variable has no effect on the affordability of low income earners to own a house. But if the odds ratio is greater than 1, then there will be an increase in the odds value, which means the variable has an effect on the affordability of low income earners to own a house. Meanwhile, if the odds ratio stands exactly at 1, that means that the independent variable has no effect on the dependent variable. So, the results achieved in Table 5 below present the odds ratio of the variables which have no effect on affordability for low income earners to own a house, only the educational qualification as all the variables have an odds ratio value that is greater than 1.

**Table 5.** The Values of Odds Ratio Test.

Variable	Odds Ratio Values
Household Income	1.128
Household Expenditures	1.014
Category A Occupation: Administration, management and technical service	8.514
Category B Occupation: Trading, Business, Clerical services, operators	6.112
Category C Occupation: Pensioner and housewife	7.819
Educational Qualification	0.641
Household with Children	1.216
Only Husband working	1.001
Only Wife working	1.247
Both Husband and Wife working	1.010
Monthly House Installment	1.721

Indicator:

Effective Variables where odds value  $> 1$

Not Effective Variables where odds value  $< 1$ .

The final test conducted is the significance level test, which is presented in Table 6 below. Here, if the significance

level value is less than 0.05, it shows that such a value was derived from the sample of the real population, and if the significance level value is greater than 0.05, it shows that such a value was not a representation derived from the real population value. Therefore, the significance test shows that all the variables have an effect on affordability, except the educational qualification variables, which have a value greater than 0.05. That means the educational qualification value has no effect on affordability among low-income earners to own a house in the FCT, Abuja, as its value stands at 0.915.

**Table 6.** The Values of Significance Level Test.

Variable	Significance level values
Household Income	0.000
Household Expenditures	0.000
Category A Occupation: Administration, management and technical service	0.007
Category B Occupation: Trading, Business, Clerical services, operators	0.000
Category C Occupation: Pensioner and housewife	0.002
Educational Qualification	0.915
Household with Children	0.021
Only Husband working	0.000
Only Wife working	0.000
Both Husband and Wife working	0.000
Monthly House Installment	0.030

Indicator:

Effective Variables is  $< 0.05$

Not Effective Variables is  $> 0.05$ .

For this research, all the three (3) tests conducted showed some level of similarity. Therefore, this research will take the entire test conducted into consideration, as most research usually puts two or one into consideration, like significance level and omnibus test, or significance and odds ratios. Then, the comprehensive nature of this research will demonstrate the importance of using the residual income approach in measuring housing affordability. This assertion aligns with studies [11-13] which have reported that the type of educational qualification attained is a variable which does not have an effect on the affordability.

## 5. Conclusion

For measuring housing affordability, the residual income approach has absolutely justified the length of practical consumption measures that can be created. Regardless, it suffers from a large number of indistinguishable constraints from other current measures. The research presented in this research shows the benefit of considering variable housing consumption and expenditures crosswise over family units or household sorts as presented in this research, which shows that the aim of this research has been achieved. Throughout the research, the approach has demonstrated that low-income earners cannot afford the minimal houses provided by organised housing developers because the smallest unit costs ₦12,000,000.00 (twelve million naira) per unit. And the

residual income approach through various tests (Omnibus Test, Odds Ratio Test, and Significance Level Test) conducted presents most of the variables that have an effect on housing affordability, which include: household income, household expenditures, occupation, number of households with children, number of household heads that are working, and monthly house instalment except Educational qualification is among the low-income earners' variables that have no effect on the capability of housing ownership. Consequently, only 14.1% of the low-income earners who earn between ₦91,000 and 120,000 and above can spend 30% of their income on housing instalments and still have a reasonable residual income for other household expenses. The analysis has shown the loopholes in the current housing policy where the major target is to provide houses that are more affordable for every class of citizen, with a focus on low-income earners.

## 6. Recommendation and Future Research

In view of the findings and conclusions of this study, the following recommendations were made: the government needs a total overhaul of the current housing policy in order to create an enabling environment where the cost of housing can be reduced and income generation can equally be increased, so that low-income earners can conveniently afford the houses provided within the FCT, Abuja and other parts of the country at large. Future research work should be focused on the sustainable way or means of providing affordable housing for the low income class and even the middle class earners within the FCT, Abuja and other parts of the country. Also, this should be done through a systematic way of reviewing the variables that have the greatest effect on the affordability of housing and equally searching for a sustainable technique that deals with economic, social, and environmental effects while achieving affordable housing with more viable and friendly policies.

## References

- [1] Adegoke, S. A. O. (2016). Housing Affordability in Nigeria: A Study of the Organized Private Sector Housing. Unpublished PhD Thesis, Ibadan: Department of Urban and Regional Planning, Faculty of the Social Sciences, University of Ibadan.
- [2] Bramley, G. (2012). Affordability, poverty and housing need: Triangulating measures and standards. *Journal of Housing and the Built Environment*, 27 (2), 133–151.
- [3] Corrigan, E., Foley, D., McQuinn, K., O' Toole, C., SlayMaker, R. (2019). Exploring affordability in the Irish housing market. *The Economic and Social Review*, 50 (1), 119–157.
- [4] FCTA. (2008). *Report of the Committee on the Review of Mass Housing Scheme in the Federal Capital Territory (FCT)*. Abuja: FCTA.
- [5] FRN (2009). *Guidelines for Housing Development in the Federal capital Territory (FCT)*, Abuja. FCTA, Abuja.
- [6] Gopalan, K., Venkataraman, M. (2015). Affordable housing: Policy and practice in India. *IIMB Management Review*, 27, 129–140.
- [7] Herbert, C., Hermann, A., McCue, D. (2018). Measuring housing affordability: Assessing the 30 percent of income standard [Conference session]. Housing Affordability, Joint Centre for Housing Studies of Harvard University, USA.
- [8] Karley, N. K., 2008, Ghana residential property delivery constraints and affordability analysis. *Housing Finance International*, Vol. XXII No. 4, June 2008, pp. 22-28.
- [9] Lawal, A. O., Adekunle, I. A (2018) Access to land and the delivery of affordable housing in Nigeria: an assessment of the federal housing authority (FHA) in Abuja, 1991 to 2013, *SAGE Open* 8 (2) (2018), doi: 10.1177/2158244018777281.
- [10] Mulliner, E., Malys, N. Maliene, V. (2016), Comparative analysis of MCDM methods for the assessment of sustainable housing affordability, *Omega* 59 (2016) 146–156 <http://doi.org/10.1016/j.omega.2015.05.013>
- [11] Noranmawati, M. S. (2013). Residual income measure of housing affordability. *International Journal of Advances in Engineering & Technology*, Vol. 5, Issue 2, pp. 1-8.
- [12] Oyo-Ita (2017). Tackling the Housing Affordability Challenge: Nigeria Experience. In 30th International Union of Housing Finance (IUHF) World Congress on “Global Opportunities in Housing Finance” (pp. 1-20). [Paper reference 1].
- [13] Sendi, R. (2014). Housing accessibility versus housing affordability: Introducing universal housing care. *Sociology and Space*, 52 (3), 239–260.
- [14] Stone, M. E., Burke, T., Ralston, L. (2011). The residual income approach to housing affordability: The theory and the practice (AHURI Position Paper No. 139).
- [15] Ukoje, J. E., & Kanu, K. U. (2014). Implementation of the Challenges of the Mass Housing Scheme in Abuja, Nigeria. *American International Journal of Contemporary Research*, 4 (4), 209-218.
- [16] Yang, Z., & Chen, J. (2014). *Housing Affordability and Housing Policy in Urban China*. Berlin: Springer. <https://doi.org/10.1007/978-3-642-54044-8>