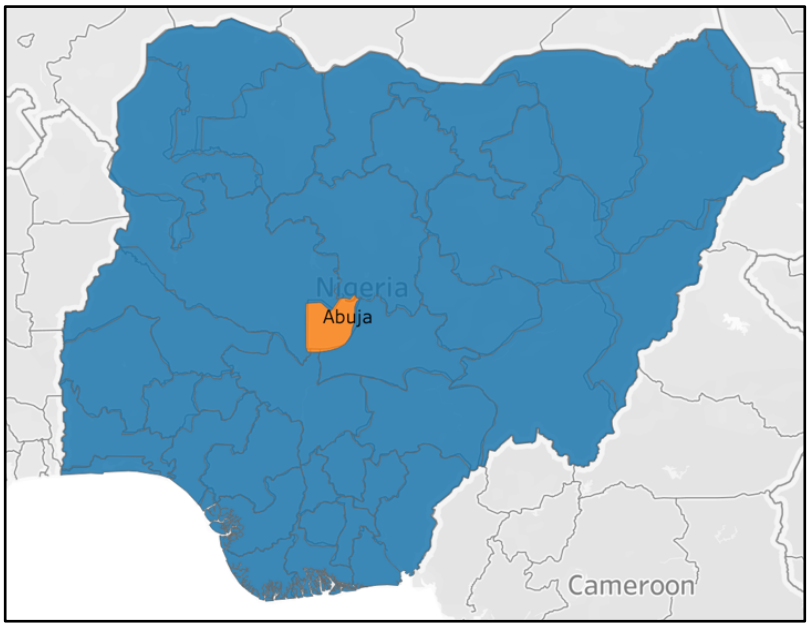
Case Study: Poverty & Inequality in Nigeria (Abuja Metropolis)



Matriculation Numbers
18311264
20710661
29212623

A group project for Poverty & Inequality course module (WiSe 2021)

Table of Contents

List of Figures

List of Tables

1.0 Introduction

Nigeria is the richest economy in Africa by GDP and the most populous African nation with a GDP per capita of $2,097 (World Bank, 2020). However, growth is only a precondition for development and does not guarantee wellbeing. The issues of development are crucial, and it is pertinent to assess the state of poverty and inequality in Nigeria, especially as the country sits as the World poverty capital (Hofer *et al.*, 2018).

It is against this background that we assess poverty and inequality in Nigeria. Data sources[1]

2.0 Findings and Interpretation

2.1 Inequality in Abuja (Nigeria)

We utilize monthly household expenditure (deflated by price indices), as an income proxy, where we explore through five inequality indicators. The Lorenz curve, a graphical representation of income spread within population. The closer the Lorenz curve to the 45^0 lines, the less income inequality (Fig 1&2). The Gini coefficient compares the prevailing inequality given by the Lorenz curve of the population with the notion of perfectly equal income distribution. We find a Gini coefficient of **0.39180** for Abuja. For a region-wise decomposition, we further determine the Gini coefficient for each region, and find 0.40276 and **0.38291** for rural and urban, respectively. Rural inequality tends to be higher in Abuja.

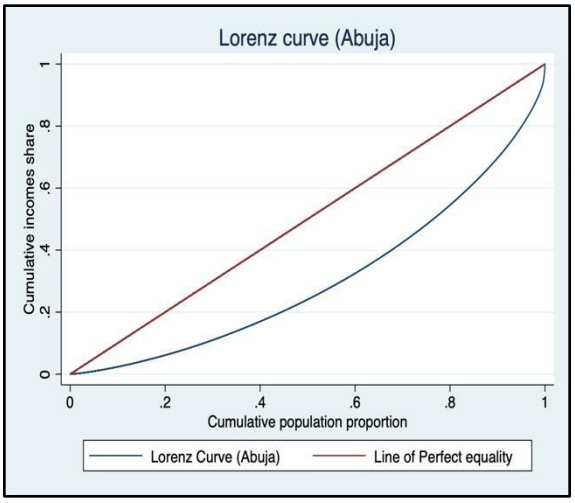


Figure 1: Lorenz Curve Abuja

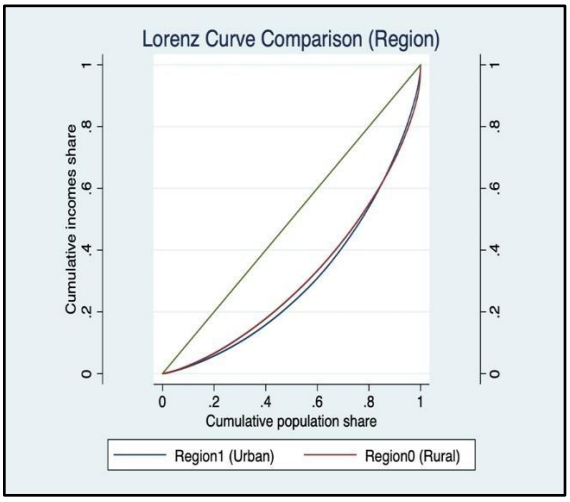


Figure 2: Lorenz Curve Abuja (by region)

[1] All tables and figures are authors' compilation based on DHS data (2018)

Table 1 shows a summary of Decile dispersion. Given that decile dispersions are susceptible to outliers, we consider other indices. The Atkinson index measures social loss owing to prevalence of inequality. Since we concerned about the bottom population, we report for (ε=2). The estimated Atkinson index suggests that only about 60% of income is necessary to attain the current level of social welfare, if income were distributed equally. A Theil index of 0.3195 indicates the income is unequal. Besides, it is evident from the Theil decomposition that the social loss due to inequality in urban regions is higher. Table 2 presents these findings.

From the foregoing, we conclude that income is unequal in Abuja, Nigeria.

Table 1: Abuja Decile Dispersion Ratio

Decile Dispersion	**Interpretations**
P90/P10	ratio of income of top 10 percent richest and bottom 10 percent is **5.528**
P90/P50	ratio of income of top 10 percent richest and middle class is **2.265**
P50/P10	ratio of income of the median distribution and poorest 10 percent is **0.410**

Table 2: Inequality Measures

Inequality indices		**Values**
Gini coefficient		0.39180
Atkinson Index (ε=2)		0.39846
Theil index (α=1)		0.31951
Theil Index (α=1) decomposition	Rural	0.29405
	Urban	0.32384

2.2 Measuring Poverty using Basic Definition

Similarly, we investigate the prevalence of poverty. First, we resolved the distributional household size equivalence, using the OECD adult equivalence scale. Figure 3 shows the share of individuals at risk of poverty (10.71%) using the EU definition, while Figure 4 shows poverty headcount ratio (6.71%). The former compares a person's income to the income of others in the same group (< 60% of median) while the latter compares a person's income to an absolute poverty line (N180,500), necessary to meet basic needs. Although the headcount ratio presents a lower poverty rate, it is pertinent to consider the share of individuals at risk, as they are prone to poverty when negative income shock occurs.

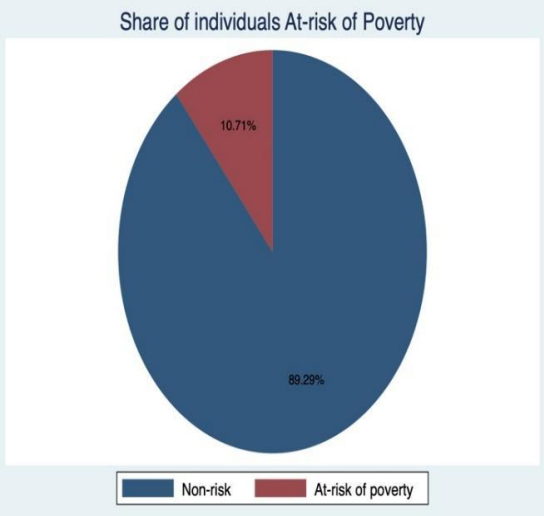


Figure 3 - Relative Poverty

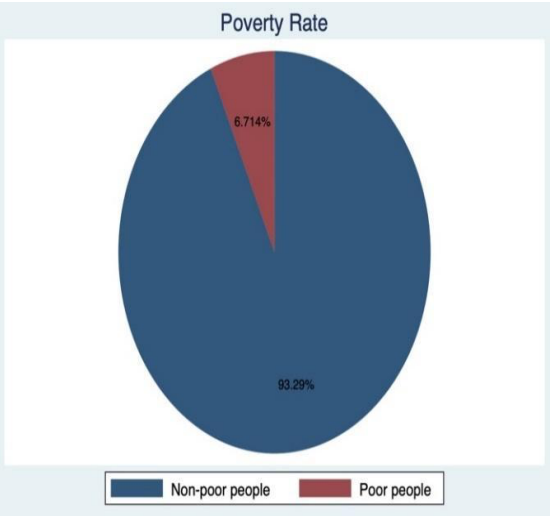


Figure 4 - Absolute Poverty

In addition, we decompose the poverty rate by gender of the household head. Using the headcount ratio, we find that poverty persists in female-led households (27.8%) than the counterparts (6.1%). This is expected and can be explained by the patriarchal nature of North-central Nigeria. In which case, women are mainly housekeepers or own small businesses and do not inherit properties. Further, we compute average squared normalized gap (0.155), which is used to compare poverty among cities or countries.

Table 3: Poverty Measures for Abuja, Nigeria

Poverty Measures		
Relative Poverty **Share of individual at risk of poverty (EU definition)**	**Frequency**	**Percent**
At risk of poverty	75	**10.71%**
Non-risk	625	89.29%
Total	700	100%
Absolute Poverty **Headcount ratio (Poverty line - N180,500)**	**Frequency**	**Percent**
Poor	47	**6.71%**
Non-Poor	653	93.29%
Total	700	100%
Poverty rate by Gender of Household head	**Male**	**Female**
	0.06158	0.27778
Average squared normalized poverty gap	0.155	

The foregoing assesses poverty solely on income. In order to answer questions on wellbeing and living standards, we consider a broader measure.

2.3 Multidimensional Poverty Measurement

2.3.1 MPI and Dimension deprivation (using equal weights)

We investigate the multidimensional poverty levels, which encompasses 3 dimensions (Education, Health and Living standards). In table 5, using equal weights for each indicator, living standard has the highest deprivation (%). The overall MPI indicates 16.0% of households are multi-dimensionally poor.

Table 4: MPI using equal weights across dimension

Multidimensional Poverty Index			
Indicator	**Indicator weight**	**Deprivation (%)**	**Result (M0)**
Education Domain			
mpi_educ	0.33	**21.137%**	**0.442**
Health Domain			
mpi_bmi	0.33	**3.703%**	**0.077**
Living Standard Domain			
water	0.11	**66.540%**	**0.181**
floor	0.11	**26.495%**	**0.139**
sanitation	0.11	**46.175%**	**0.161**

2.3.2 MPI and Dimension deprivation (using custom weights)

Alternatively, we assign higher weight (0.40) to education dimension and maintain equal weights (0.30) for other dimensions. The reason for prioritizing the education is a normative one. We argue that well educated citizens can make better informed choices that improves their overall functioning. Based on this, 59.7% of households are multi-dimensionally poor in the education indicator and overall MPI indicates 14.2% of households are multidimensionally poor.

Table 5: MPI using custom weights across dimensions

Multidimensional Poverty Index			
Indicator	**Indicator weight**	**Deprivation (%)**	**Result (M0)**
Education Domain			
mpi_educ	0.40	**21.137%**	**0.597**
Health Domain			
mpi_bmi	0.30	**3.703%**	**0.068**
Living Standard Domain			
safewater	0.10	**66.540%**	**0.133**
floor	0.10	**26.495%**	**0.090**
sanitation	0.10	**46.175%**	**0.112**

2.3.3 The Relationship between household size and age of household head

Figure 5 depicts a curvilinear association. Higher household size correlates with older household head until age 50, where household size declines with increasing age.

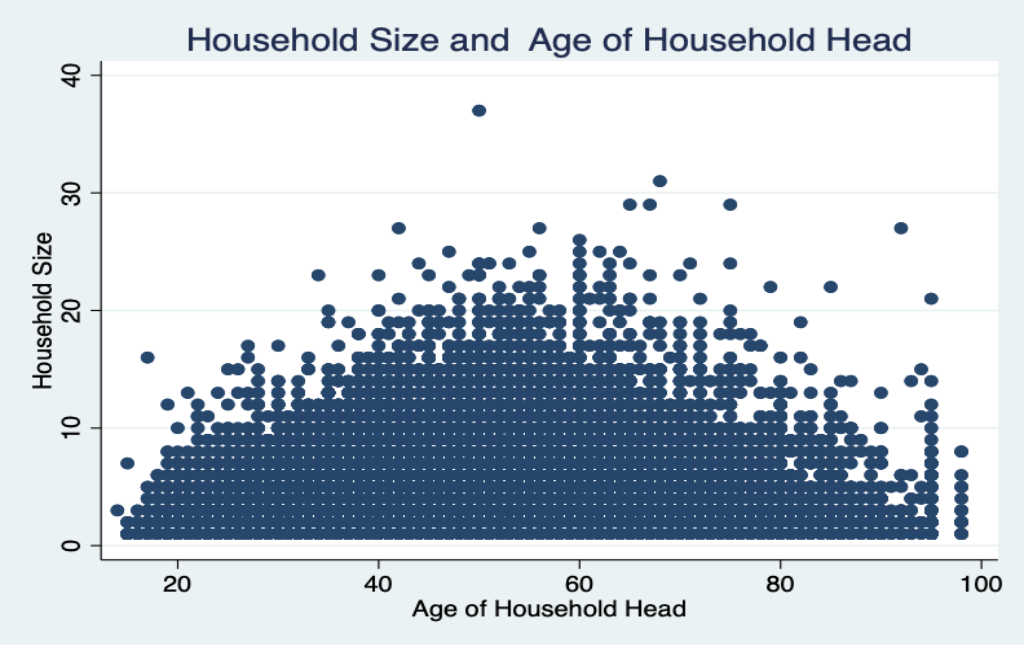


Figure 5: Scatter plot showing the relationship between household size and the age of household head

2.3.4 Regression Modeling (Deprivation in Education)

$$mpi\_educ_i = \alpha_1 + \beta_1 ln\ \_hhsize_i + \beta_2 headage_i + \beta_3 regiontype_i + \beta_4 headsex_i + \varepsilon \ldots. (1)$$

Before estimating the regression model (1), we log-transform variable (household size) due to skewness of data. Table 6 shows the estimation result.

Table 6: Deprivation in Education

VARIABLES	(1) mpi_educ
ln_hhsize	-0.0485***
	(0.00278)
headage	0.00266***
	(0.000127)
regiontype	0.204***
	(0.00400)
headsex	-0.0171***
	(0.00520)
Constant	0.0363***
	(0.00713)
Observations	40,427
R-squared	0.071

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

We find that all regressors are statistically significant at 1% and:

- On average, with a one percent increase in household size the probability of being deprived in education decreases by 0.0485 percentage points.
- if the age of the household head increases by one year, ceteris paribus, then the probability of being deprived in education increases by 0.266 percentage points on average.
- On average, residing in a rural area is associated with a higher chance of being deprived in education by 0.2041 compared to the urban dwellers, ceteris paribus.
- On average, living in a female headed house is associated with a lower probability of being deprived in education by 0.0171 compared to their male headed households, ceteris paribus.

3.0 Conclusion and Policy Recommendation

Our study finds that poverty and income inequality persist in Nigeria. We find multidimensional poverty to be at 16.0%. Also, the regression estimation and Gini coefficients signals education deprivation and higher inequality for rural dwellers. Based on these findings, we make the following policy recommendations:

I. Poverty alleviation programs should target the broader group- "at risk of poverty", not only those below the poverty line.

II. Prioritization of rural poor is necessary to ensure equality. Government can grant tax holiday or other government aids to rural business. Again, there is need to increase school attendance and improve quality of education in rural areas.

III. Finally, there is a need for sensitization on sanitation and improvement of waste management to reduce deprivation in living standards.

References

Hofer, H. K., Kristofer Hamel, and Martin (2018). The start of a new poverty narrative. Brookings. https://www.brookings.edu/blog/future-development/2018/06/19/the-start-of-a-new-poverty-narrative/

Worldbank.org. (2020). GDP per capita (current US$) – Nigeria. Available at: https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=NG.