



Assessing poverty incidence among the elderly with and without pensions in Ekiti state

Akintunde Oyetunde A^{1*}, UBAKA Ngozi O², AJIBADE Olufemi S³, BELLO Omofolake O⁴

^{1,2} Department of Mathematics, Faculty of Science, Federal University Oye-Ekiti, Ekiti State, Nigeria

³ Department of English and Literary Studies, Faculty of Art, Federal University Oye-Ekiti, Ekiti State, Nigeria

⁴ No 3 Pedro Street, Otunneye Layout, Eleyele, Ibadan

Abstract

The research study assesses poverty incidence among the elderly with and without pension in selected localities in Ekiti State. It adopted the monetary measure of poverty using consumption expenditure as poverty index. Structured questionnaire was used to collect data from 340 households randomly sampled in 24 enumeration areas across the three senatorial districts in Ekiti State. Binary logistic regression estimation method was used for the analyses. The finding shows that whereas households with elderly only, elderly and children, as well as elderly and working age had high poverty incidence, but mixed households had low incidence of poverty. With reference to pensions, households with elderly who are recipients of pension had a significantly low incidence of poverty compared to those without pensions. In order to tackle old age poverty, the research study recommends that public policy must target the poorest among the poor in specific household type with elderly without pension.

Keywords: poverty, elderly, pension, binary logistic regression

Introduction

It is noted that as one grows into old age, the ability to exchange active labour hours with income generation activities may reduce. (WHO, 2002) ^[24] However, the risk of being attack by numerous health problems increases and the chance of slipping into poverty are often inevitable for many elderly in low income households, especially, in the developing countries like Nigeria. These sort of conditions are unescapable, particularly, among the vast majority of the elderly who do not receive any form of pension in a country like Nigeria. This is simply because they may have worked in the non-formal sector and were unable to contribute into the social security pension scheme or could not work with the Government to get Government pension.

In many of the developed countries, old-age poverty is something which do not often happen (ILO, 2014) ^[12] because there are enough social protection system in place to guarantee the provision of basic income and essential health facilities. For instance, more than 90 percent of elderly persons in North America and Europe above statutory pensionable age receive a pension (ILO, 2014) ^[12]. However, the elderly situation in most of the developing countries, especially countries without any form of social security pension benefits for the vast majority of elderly are susceptible of falling into old age poverty (UN, 2015). The lack of guarantees such as basic income security and essential health care for the elderly that are not covered by contributory pension schemes makes them vulnerable and socially excluded with no safeguard against poverty (ILO, 2014) ^[12]. Some developed countries such as the United Kingdom and United States of America have developed specific poverty strategies to tackle particular types of poverty across the life cycle (like child poverty, working poverty and old-age poverty) which has yielded significant success (Domfe, 2013; Joassart-Marcelli, 2004) ^[6, 13].

The economic conditions of the elderly in Sub-Saharan Africa (SSA) countries have not been systematically studied and analyzed with appropriate social protection and Nigeria is no exception. Kakwani and Subbarao (2005) used various national data collected across selected SSA countries between the period of 1998 -2001 to investigate “ageing and poverty in Africa and the role of social pensions and found high incidence of poverty among households with elderly”. In many countries in SSA and in Asia where there is no pension in place, it is noted that elderly persons are more likely to be poor than younger ages (UN, 2015). Evidence suggested strong correlation between poverty and a household with elderly persons in Africa (Faye, 2007) ^[7].

Only few studies are carried out to assess the poverty levels of the elderly. The few of the indigenous studies that exist have not made any empirical assessments of pensions and old age poverty (Kpessa, 2011; Appiah-Kubi, Oduro, & Senadza, 2008; Kumado & Gockel, 2003; Dei, 2001) ^[17, 1, 18]. For instance, Kpessa (2011) ^[17] in comparing recent pension reforms in Ghana and Nigeria, concluded on the risk of not achieving the objective of providing adequate benefits. This was due to the introduction of defined contribution scheme that places the ultimate burden of risk on individuals’ level of savings and knowledge of financial markets. Kumado and Gockel (2003) ^[18] also compared the social security in a developing country like Ghana to that of Switzerland, Chile and Singapore, and recommended reforms of pension system in Ghana as a model to other developing countries, most especially the SSA. This research contribute by studying areas not research and also adopts different methodology in the approach.

However, scanty studies on sub-Saharan Africa (SSA) included Nigeria as part of a cross country studies do exist (Kakwani & Subbarao, 2005). Due to the cross country nature of these studies, less details are known about in-country regional incidence of

poverty and other specific households' issues. Thus, the relationship between pensions and old age poverty is not clear in the context of Nigeria. It is the desire to bridge this gap in knowledge that this study seeks to contribute to assess the effect of public pensions on old age poverty in selected localities in Ekiti State. Following the problems discussed above, the specific question that arises for investigation is: what is the poverty incidence of different household types with elderly and pension or non-pension recipients?

2. Methodology

A questionnaire survey was used to directly collect data from the three senatorial districts in Ekiti State, which is made up of sixteen (16) Local Government Areas. The structured questionnaires were administered within the sampled localities to households made up of elderly only (i.e. persons aged 60 and older); elderly and children (i.e. persons aged 15 and below); elderly and working age (i.e. persons aged between 16 and 59 years); and mixed households (i.e. all ages). The division of households into different subgroups was undertaken to avoid any bias with the whole as indicated by Truglia (2009). Furthermore, the households with elderly were subdivided into households with elderly recipients of pension and non-recipients of pension. Fifteen (15) households per enumeration area (EA) were used. Twenty-four (24) EAs were sampled based on sampling survey formula and probability proportion to population size. A sample size of 340 made up of 80; 140; and 120 in Ekiti South, Ekiti Central and Ekiti North Senatorial Districts respectively was obtained by random sampling method respectively. A systematic sampling through the usage of a listing form was adopted to identify the households with elderly persons within each EA. An audit of the recorded data was undertaken to cross-check the consistency of the captured data against the data recorded on the individual questionnaire. A binary logistic regression method was used for the analyses of the data. A logistic regression model is applicable to situation with dichotomous dependent and independent variables that takes predicted values between $y_i = \{0,1\}$ or written as related to this study as:

$$y_i = \begin{cases} 1, & \text{if } y_i \text{ is poor} \\ 0, & \text{if } y_i \text{ is non - poor} \end{cases} \text{ For binary logit} \quad (1)$$

where y_i was specified as binary variable with value of 0 or 1, and assumed $y_i \sim \text{Bernoulli}(\pi)$, such that $\pi = \text{Pr}[y_i = 1]$ with $0 < \pi < 1$, and have $\text{Pr}[y_i = 0] = 1 - \pi$, where Pr represents probability and y_i is the dependent variable or poverty status. Thus, a household with elderly that was poor was specified as 1 and 0 if the household with the elderly was non-poor. With logit model, where the value π_i depends on the explanatory variable x_i , the individual specific probabilities are written as:

$$\text{Pr}[y_i = 1] = \pi_i \quad (2)$$

That is in a simple binary equation format as in logit model, it is written as:

$$\text{Pr}[y_i = 1] = \frac{\exp(\alpha + \beta_1 x_i)}{1 + \exp(\alpha + \beta_1 x_i)} \quad (3)$$

$$\text{Pr}[y_i = 0] = \exp\left(\frac{1}{1 + \exp(\alpha + \beta_1 x_i)}\right) \quad (4)$$

and as odds ratio, it becomes:

$$\frac{\text{Pr}[y_i=1]}{\text{Pr}[y_i=0]} = \exp(\alpha + \beta_1 x_i) \quad (5)$$

Field (2005:225) defined the odds ratio as “an indicator of the change in odds from a unit change in the predictor”. It is the probability of a Yes (or being poor) over the probability of a No (or being non-poor). The $\exp(\alpha + \beta_1 x_i)$ in equation (5) is the exponentiated coefficient (as odds ratio) rather than the logit coefficient in equations (3 and 4). The odds ratio signifies the effect of a one unit of change in x_i in the predicted odds ratio with the other variables in the model held constant. In this study, the odds of becoming poor are the probability of being poor divided by the probability of not being poor (i.e. non-poor). The model in equation (5) was specified in the functional form as (6):

$$\frac{\text{Pr}[y_i=1]}{\text{Pr}[y_i=0]} = \exp(\alpha + \beta_1(D_{EP})_i + \beta_2(D_{EC})_i + \beta_3(D_{WP})_i + \beta_4(D_{MH})_i + \varepsilon_i) \quad (6)$$

where D is a dummy; EP is households with elderly persons only; EC is households with elderly and children; WP is households with elderly and working age; MH is Mixed Household; and y_i is the expenditure of a person or household below the poverty line of N216, 000:00 per annum or N18,000:00 per month (as determined by the Lead Researcher/Lead Author, which happen to be the minimum wage in Nigeria). The equation estimates the percentage of individual households within a population of interest that are referred to as poor. This usually referred to as the headcount poverty which relates to incidence of poverty and the poverty gap relates to its intensity (Franco, Marino, & Tommasino, 2008).

The second part of specific objective relates to households with or without pension recipient as specified in equation (7):

$$\frac{\text{Pr}[y_i=1]}{\text{Pr}[y_i=0]} = \exp(\beta_0 + \beta_1 R_i + \beta_2 NR_i + \varepsilon_i) \quad (7)$$

Where R_i is Recipient; NR_i is Non-recipient and ε_i is the error term.

3. Results and Discussion

Results from estimation of equation (6) in hierarchical form presented in Table 1 as shown below suggests that whereas living in a households with elderly persons only was highly likely of being poor by approximately 400 percent (that is 5.096-1= 4.096), living in the households with elderly persons and children was also highly likely of being poor by an estimate of 140 percent (2.375-1 = 1.375). Again in Table 1, while living in a mixed households was less likely of being poor by an estimate of 79 percent (0.214 – 1 = 0.786), living in the households with elderly and working age persons was highly likely of being poor by an estimate of 20 percent 1.199-1 = 0.199).

Table 1: Individual Household Type On Poverty

Estimate	Elderly only	Elderly and Children	Elderly and Working Age	Mixed Households
Coefficient	1.628**	0.865*	0.182	-1.540
Standard Error	0.316	0.348	0.265	0.242
Wald	26.553	6.191	0.471	40.511
Odd Ratio	5.096	2.375	1.199	0.214

Estimation method: ML. Logit. Dependent variable = Poverty rate
 *** Significant at the 1% level, ** Significant at the 5% level

In Table 2 below, the finding with multivariate estimates of equation (6) in model one shows that a person living in a household with elderly person only was 8.97 times more likely of being poor. This was higher than the results from the bivariate estimates in Table 1 above. Households with elderly and children; and elderly and working age persons were 5.09 and 2.74 times highly likely of being poor respectively. This indicates that the model predicts that the odds of becoming poor was highly associated with elderly persons only than living in the other households' types. Each predictor met the 0.05 statistical significance test chosen.

In order to resolve if any, the problem of omitted variable bias in the analysis, educational achievement was introduced in equation (6) as a control variable in model two and the results still indicate that households with elderly persons only are highly likely to contributes approximately 9 times to being poor than other households types (see Table 2 below for details). At the same time, the educational achievement itself is highly likely to lower poverty by 0.2 times. Intuitively, acquiring formal education enhances a person's job prospect that leads to a higher standard of living. Therefore, it is expected that educational attainment should reduce old age poverty.

Table 2: Binary Logistic Regression Models for Households with elderly with or without pension effect on poverty

Independent Variable	Model 1		Model 2		Model 3		Model 4	
	B	OR	B	OR	B	OR	B	OR
Constant	-3.71***	0.02	-2.92***	0.05	2.44***	11.5	-0.17	0.84
	(0.62)		(0.66)		(0.43)		(0.13)	
Elderly only	2.19***	8.97	2.21***	9.15				
	(0.35)		(0.37)					
Elderly and Children	1.63***	5.09	1.73***	5.67				
	(0.38)		(0.41)					
Elderly and Working Age	1.01***	2.74	0.86**	2.36				
	(0.29)		(0.32)					
Education			-1.58	0.21				
			(0.26)					
Pension Recipient					-2.62***	0.07		
					(0.44)			
Non-Pension Recipient							2.62***	13.67
							(0.44)	

*p< 0.05; **p<0.001; ***p<0.0001; standard error in parentheses; B = regression coefficient; OR = odds ratio; dependent = poverty line.

The second part of the specific objective was to investigate how much of the changes in poverty levels was predicted by households with elderly recipients or non-recipients of pensions in equation (7). For every one unit increase in a household expenditure with elderly persons receiving a monthly public pension, the odds that poverty would be lower was estimated as 93 percent (0.073 – 1 = - 92.7). In other words, a one unit increase in expenditure of a household with elderly person recipient of pension was associated with a 93% lower incidence of poverty (see Table 2 above for details). The result supports Kakwani and Subbarao (2005) findings that a recipient of pension benefit is less likely to experience old age poverty.

On the contrary, the effects of household with elderly persons without monthly pension income were approximately 14 times highly likely of being poor. This could even be much worse if a person live in a household of elderly person only. The economic intuition behind this is that households with elderly that are non-recipient of pension are burden by the presence of the elderly who is without any form of regular income. The finding confirms Faye (2007) [7] results that there is high correlation between poverty

and elderly person in the household in most African countries and also supports UN (2015) claim that many age into poverty in sub-Saharan Africa. This finding shows that the high incidence of poverty found could be partly be explained by the lack of pension benefits to the vast majority of the elderly in the country. The result is consistent with Kidd (2009) and Kidd & Whitehouse (2009) [16] that pension transform the living conditions of the elderly and the lack of pension as key contributed to old age poverty. In all the four models estimated, the result shows that the models are better at predicting old age poverty more accurately.

4. Conclusion and policy implications

The main aim of the study was to assess the poverty incidence of elderly with or without pension in selected localities in Ekiti State. The finding shows that the overall poverty incidence in households with the elderly is by far higher than the national average. This result reveals that old age poverty exist and it occurred in certain household types due to factors such as: the type of households the elderly lives in; whether the elderly is a

recipient or non-recipient of pension; and lack of formal education. The finding shows that in all cases households with elderly only, and elderly and children, are highly likely to experience higher levels of poverty. However, household with elderly persons that receive monthly pensions are less likely to be poor.

As a policy implication the result means that to change old age poverty the following policies should be considered and implemented. Firstly, public policy benefit must be targeted to households with elderly only and elderly and children. Secondly, household types with elderly without pension benefit and elderly females' households must be targeted. In terms of pension effect, the State Government should consider introducing a pension scheme that covers the vast majority that are not covered by the existing public pension schemes.

References

1. Appiah-Kubi K, Oduro A, Senadza B. Understanding Poverty in Ghana: Risk and Vulnerability. In E. Aryeetey, & R. (Kanbur, *The Economy of Ghana. Analytical Perspectives in Stability, Growth and Poverty*. UK, Ghana. James Currey Ltd, UK; Woeli Publishing Services, Ghana, 2008, 299-324.
2. Barrientos A, Gorman M, Heslop A. Old age poverty in developing countries contributions and dependence in later life. *World Development*. 2003; 31(3):555-570.
3. Dartano T. Does Choice between an Endogenous and a Fixed Poverty Line Affect the Poverty Outcome of Policy Reform? *Modern Economy Journal*. 2011; 2:667-673.
4. Dei H. Public Pension Fund Management in Ghana. *Paper Presented at 2001 World Bank Public Pension Management Conference*. Washington. USA, 2001.
5. Dercon S, Shapiro J. Moving On, Staying Behind, Getting Lost: Lessons on Poverty Mobility from Longitudinal Data. In D. a. Narayan, *Moving out of Poverty. Cross-Disciplinary Perspective on Mobility*. USA: Palgrave Macmillan and the World Bank, 2007, 77-126.
6. Domfe G. *Implications of Labour Inefficiency and Underemployment for Working Poverty. The care of the Informal Sector in Ghana*. Accra: Legon PhD (ISSER Library) Thesis. University of Ghana, 2013.
7. Faye O. Basic Pensions and Poverty Reduction in Sub-Saharan Africa. *CREPP*, 2007.
8. Field A. *Discovering Statistics Using SPSS*. London: Sage Publications, 2005.
9. Foster J, Greer J, Thorbecke E. A Class of Decomposable Poverty Measure. *Econometric*. 1984; 52(2):761-766.
10. Franco D, Marino RM, Tommasino P. Pension Policy and Poverty in Italy: Recent Development and New Priorities. *Giorrale degli Economisti Amali di Economia*. 2008; 67(2):119 - 159.
11. ILO. *Working out of Poverty. Views from Africa. Special Meeting in Addis Ababa*. Geneva, Switzerland International Labour Office, 2003.
12. ILO. *World Social Protection Report 2014/15. Building economic recovery, inclusive development and social justice*. Geneva: International Labour Office, 2014.
13. Joassart-Marcelli P. *Working Poverty in Southern California: Towards an operational measure*. Boston, USA: Department of Economics, University of Massachusetts 100 Morrissey Blvd, 2004.
14. Kaplinsky R. *Globalisation, Poverty and Inequality*. UK: Polity Press, 2008.
15. Kidd S. Equal pensions, equal rights: achieving universal pension coverage for older women and men in developing countries. *Gender & Development*, 2009, 377-388.
16. Kidd S, Whitehouse E. Pensions and Old Age Poverty. In C. 3, *Closing the Coverage Gap: Role of Social Pension and Other Retirement Income*, 2009, 41-56.
17. Kpessa MW. A Comparative analysis of pension reforms and challenges in Ghana and Nigeria. *International Social Security Review*. 2011; 64(2):91- 109.
18. Kumado K, Gockel A. *A Study on Social Security in Ghana*. Accra: Trade Union Congress, 2003.
19. Osei-Fosu A. *Three Essay on Economic Impact Assessment of Highly Indebted Poor Countries (HIPC) Initiative for Poverty Reduction in Ghana*. Kumasi: KNUT PhD (Economics Department) Thesis. Kwame Nkrumah University of Science and Technology, 2010.
20. Tilly C. Poverty and the Politics of Exclusion. In D. & Narayan, *Moving out of Poverty*, 2007, 45-75.
21. Washington. International Bank for Reconstruction and Development/the World Bank.
22. Truglia RN. *Applied Econometrics using stata*. Department of Economics. Havard University. Retrieved August 21, 2015, from Website: <http://www.people.fas.harvard.edu/~rtruglia/applied.pdf>
23. UN. *World Population Ageing 2015. Economic and Social Affairs*. New York: United Nations, 2015.
24. WHO. *Active Ageing: A Policy Framework*. The Aging Male, 2002, 5(1), Taylor & Francis.