



**DETERMINANTS OF HOUSEHOLD WELFARE AND POVERTY IN  
UGANDA:  
EVIDENCE FROM THE 2019/20 UGANDA NATIONAL PANEL SURVEY**

BY

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# **DECLARATION**

I, ARINDA ELIZABETH, declare that this research project is entirely my original work and has not been submitted to any other institution for the purpose of obtaining an academic award.

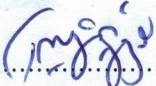
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### APPROVAL

This research project has been submitted to the School of Statistics and Planning, with my approval, in partial fulfillment of the requirements for the award of a degree in Quantitative Economics.

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## **DEDICATION**

This work is dedicated to my family more so my parents Mr. Katenguzi Bazirio and Mrs. Kirabo Jolly and friends for their unwavering support, encouragement, and guidance throughout the course of my studies.

## **ACKNOWLEDGEMENT**

I express my sincere gratitude to my supervisor, Dr. Tuyiragize Richard, for the guidance and support provided throughout this research. I also thank my lecturers and the Department of Planning and Applied Statistics for their academic assistance.

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## **ACRONYMS/ABBREVIATIONS**

AME — Average Marginal Effect

CAPI — Computer-Assisted Personal Interviewing

GDP — Gross Domestic Product

HC1 — Heteroskedasticity-Consistent (robust) standard errors, version 1

ISIC — International Standard Industrial Classification

LSMS — Living Standards Measurement Study

NDP III — National Development Plan III

OLS — Ordinary Least Squares

SDG — Sustainable Development Goal

UBOS — Uganda Bureau of Statistics

UGX — Ugandan Shilling

UNHS — Uganda National Household Survey

UNPS — Uganda National Panel Survey

UPE — Universal Primary Education

VIF — Variance Inflation Factor

## **ABSTRACT**

This study examined the determinants of household welfare and poverty in Uganda using secondary household-level data from the 2019/20 Uganda National Panel Survey (UNPS), collected by the Uganda Bureau of Statistics (UBOS). The main objective was to examine how household demographic composition, household head characteristics, and employment and locational factors relate to household welfare, measured as per capita consumption expenditure and poverty status.

Using a final analytic sample of 3,062 households, the study applied descriptive statistics, bivariate chi-square tests, an Ordinary Least Squares (OLS) regression of log per capita welfare, and a probit regression of poverty status with average marginal effects. Household size and the dependency ratio were negatively associated with welfare; the household head's education was the strongest and most consistent determinant of welfare across all stages of analysis; and location, particularly residence in the Northern region, carried the largest welfare penalty and poverty risk of any variable examined. Notably, the sex of the household head was not a significant predictor of poverty status, contrary to the common assumption that female-headed households are inherently more vulnerable, a finding consistent with earlier Ugandan evidence.

The study concludes that household demographic composition, the household head's education, and geography remain central, structural determinants of welfare and poverty in Uganda. It recommends continued investment in education and family planning services, sustained prioritisation of lagging regions such as the North, and caution against using the sex of the household head as a standalone targeting criterion in social protection programmes.

# **CHAPTER ONE: INTRODUCTION**

## **1.1 Background to the Study**

Household welfare is a central concept in development economics, commonly used to describe the material living standards of a household, typically measured through income or consumption expenditure. Poverty, in turn, refers to a state in which a household's resources fall below a defined minimum threshold required to meet basic needs, commonly estimated using the cost of basic needs approach, which combines a food poverty line with an allowance for essential non-food expenditure (Ravallion & Bidani, 1994). In Uganda, as in much of Sub-Saharan Africa, household welfare is conventionally measured using per capita consumption expenditure derived from nationally representative household surveys, given that consumption is considered a more stable and reliable proxy for living standards than income, particularly among rural and agriculture dependent households (Appleton & Ssewanyana, 2003).

The Uganda Bureau of Statistics (UBOS) has, since the early 1990s, periodically conducted the Uganda National Household Survey (UNHS) to monitor poverty, employment, education, health, and other welfare indicators at the national and sub-national level (Uganda Bureau of Statistics [UBOS], 2021). Complementing the UNHS, UBOS has, since 2009, implemented the Uganda National Panel Survey (UNPS), a household panel survey that revisits a nationally representative sample of households to provide more frequent, household-level data on income dynamics, service delivery, and consumption expenditure (UBOS, 2021). According to the most recent UNHS report, Uganda's national poverty rate stood at 20.3 percent in 2019/20, a figure that conceals substantial regional disparities, with poverty remaining considerably more pervasive in the Northern region, including the Karamoja sub-region, than in Central or Western Uganda (UBOS, 2021; World Bank, 2022). Uganda's economy also remains heavily reliant on smallholder agriculture, a sector that continues to employ the majority of the working population, despite a gradual structural shift toward non-farm and wage employment among wealthier and more educated households (Appleton & Ssewanyana, 2003; World Bank, 2022).

A substantial body of empirical literature has examined the determinants of household welfare and poverty in Uganda using earlier rounds of national survey data. Deininger and Okidi (2003), using panel data spanning 1992 to 2000, found that agricultural commodity prices, access to electricity,

and education were strong predictors of household income growth and poverty reduction. Earlier still, Appleton and Balihuta (1996) demonstrated that education raises agricultural productivity and, by extension, household welfare, while Lanjouw and Ravallion (1995) established a now widely replicated finding that larger households tend to report lower per capita welfare, since the dependency burden of additional members typically outweighs any economies of scale in consumption. More recent UBOS reports and World Bank assessments continue to identify household size, education, employment sector, and rural-urban location as key correlates of poverty status (UBOS, 2021; World Bank, 2022). However, much of the rigorous, multivariate micro econometric evidence specific to Uganda predates the 2019/20 survey round, and existing UBOS publications on the 2019/20 data are themselves largely descriptive, reporting headcount ratios and cross-tabulations rather than estimating the independent, multivariate contribution of household and household-head characteristics to welfare outcomes. This leaves a gap in up-to-date, regression-based evidence on the determinants of household welfare using the most recent nationally representative panel data available, a gap this study seeks to address.

Building on this body of work, the present study uses household-level data from the 2019/20 Uganda National Panel Survey to empirically re-examine the determinants of household welfare and poverty in Uganda, with the aim of providing updated, multivariate evidence that complements existing descriptive statistics and informs the objectives outlined in the sections that follow.

## **1.2 Problem Statement**

Despite notable progress in reducing income poverty in Uganda over the past two decades, a substantial share of the population remains unable to meet basic consumption needs. As at the 2019/20 survey round, Uganda's national poverty rate stood at 20.3 percent using the official national poverty line; however, when measured using a revised, higher poverty line of USD 1.77 per person per day, the proportion of Ugandans living in poverty rises to approximately 30.1 percent, equivalent to over 12.3 million people (UBOS, 2021). These figures indicate that, notwithstanding headline progress, poverty in Uganda remains widespread and sensitive to the choice of poverty line and measurement approach.

This problem is not evenly distributed across the country. Rural households, those dependent on subsistence agriculture, and households located in the Northern region, particularly the Karamoja

sub-region, continue to experience disproportionately high poverty rates relative to the national average (UBOS, 2021; World Bank, 2022). Persistent poverty of this kind undermines Uganda's broader development ambitions, including its Vision 2040 goal of attaining middle-income status and its commitments under Sustainable Development Goal 1 (No Poverty), and remains a central concern for policymakers, development partners, and researchers working on social protection and rural development in Uganda.

If the household and individual drivers of poverty are not adequately understood, poverty-reduction policies risk being poorly targeted, inefficient, or unsustainable in the face of future economic shocks. Persistently high poverty also carries long-run consequences for human capital accumulation, since poor households are less able to invest in their children's education and health, potentially perpetuating poverty across generations (Appleton & Balihuta, 1996; Deininger & Okidi, 2003).

While prior studies have identified several household-level correlates of poverty in Uganda, including household size, education, and access to infrastructure, much of this evidence is based on survey data collected well over a decade ago (Deininger & Okidi, 2003; Lanjouw & Ravallion, 1995), and the more recent UBOS reports on the 2019/20 survey round remain primarily descriptive (UBOS, 2021). There is, therefore, limited up-to-date, multivariate evidence on the relative importance of household size, dependency ratio, household-head characteristics, employment sector, and location in explaining household welfare and poverty status using the most recently available nationally representative panel data. Given the scope and resource constraints of an undergraduate dissertation, this study narrows its focus to these specific household- and head-level determinants of welfare and poverty, using the 2019/20 UNPS data and standard regression techniques, rather than attempting a broader analysis covering all dimensions of welfare or the full historical panel.

## **1.3 Objectives of the Study**

### ***1.3.1 Main Objective***

To examine the determinants of household welfare and poverty in Uganda using data from the 2019/20 Uganda National Panel Survey.

### ***1.3.2 Specific Objectives***

The specific objectives of the study are to:

1. Examine the effect of household size and dependency ratio on household welfare.
2. Assess the relationship between the household head's education, age, and sex, and household welfare.
3. Determine the influence of employment sector and location (urban/rural and region) on the likelihood of a household being poor.

### **1.4 Research Questions and Hypotheses**

In line with the specific objectives above, the study seeks to answer the following research questions:

4. What is the effect of household size and dependency ratio on household welfare in Uganda?
5. How do the household head's education, age, and sex relate to household welfare?
6. What is the relationship between employment sector, location, and the likelihood of a household being poor?

Corresponding to these questions, and consistent with standard practice in quantitative economic research, the study tests the following hypotheses, stated in the alternative form:

H1: Household size and dependency ratio have a statistically significant effect on household welfare.

H2: The household head's education, age, and sex are significantly associated with household welfare.

H3: Employment sector and location significantly influence the likelihood of a household being poor.

### **1.5 Significance of the Study**

This study contributes to the existing literature on poverty and household welfare in Uganda by providing updated, regression-based evidence using the 2019/20 UNPS, a more recent dataset than that used in most prior Ugandan studies (Deininger & Okidi, 2003; Lanjouw & Ravallion, 1995;

Appleton & Balihuta, 1996). In doing so, it complements the largely descriptive statistics published by UBOS on the 2019/20 survey round with multivariate analysis of the independent contribution of specific household- and head-level characteristics to welfare outcomes.

The findings are expected to be of practical relevance to policymakers within the Ministry of Finance, Planning and Economic Development, the National Planning Authority, and development partners and non-governmental organisations engaged in designing and targeting social protection and poverty-reduction interventions in Uganda. Households, particularly those in rural and agriculture-dependent communities, stand to benefit indirectly from better-targeted policy responses informed by this evidence.

By identifying which household and head-level characteristics are most strongly associated with welfare and poverty status, the study can inform the design and targeting criteria of social protection programmes and contribute to the evidence base underlying Uganda's National Development Plan poverty-reduction strategies.

The study is further aligned with Sustainable Development Goal 1 (ending poverty in all its forms), Uganda's Vision 2040 development agenda, and the poverty-reduction objectives embedded in successive National Development Plans, all of which prioritise evidence-based approaches to understanding and addressing household poverty (UBOS, 2021; World Bank, 2022).

## **1.6 Scope of the Study**

This study is confined, in content, to the determinants of household welfare and poverty, focusing specifically on household size, dependency ratio, the household head's age, sex, and education, employment sector, and location (urban/rural and region). Geographically, the study covers Uganda at the national level, drawing on the nationally representative sample captured in the 2019/20 UNPS. In terms of time, the study is cross-sectional, relying on data collected during the 2019/20 survey round rather than the full historical panel, and does not, therefore, examine welfare dynamics over time. Methodologically, the analysis is limited to standard regression techniques, namely Ordinary Least Squares regression on log per capita consumption expenditure and a probit model on poverty status, estimated using Stata; broader, non-monetary, or multidimensional measures of poverty fall outside the scope of this study.



## **CHAPTER TWO: LITERATURE REVIEW**

### **2.0 Introduction**

This chapter situates the present study within the broader body of research on household welfare and poverty, drawing together theory and empirical evidence relevant to the three objectives set out in Chapter One. It opens with the theoretical perspectives that motivate the choice of variables, moves to a conceptual framework mapping out how these variables are expected to interact, and then works through the empirical evidence on household size, household head characteristics, and employment and location, before closing with a short synthesis that points to where the existing literature falls short.

### **2.1 Theoretical Framework**

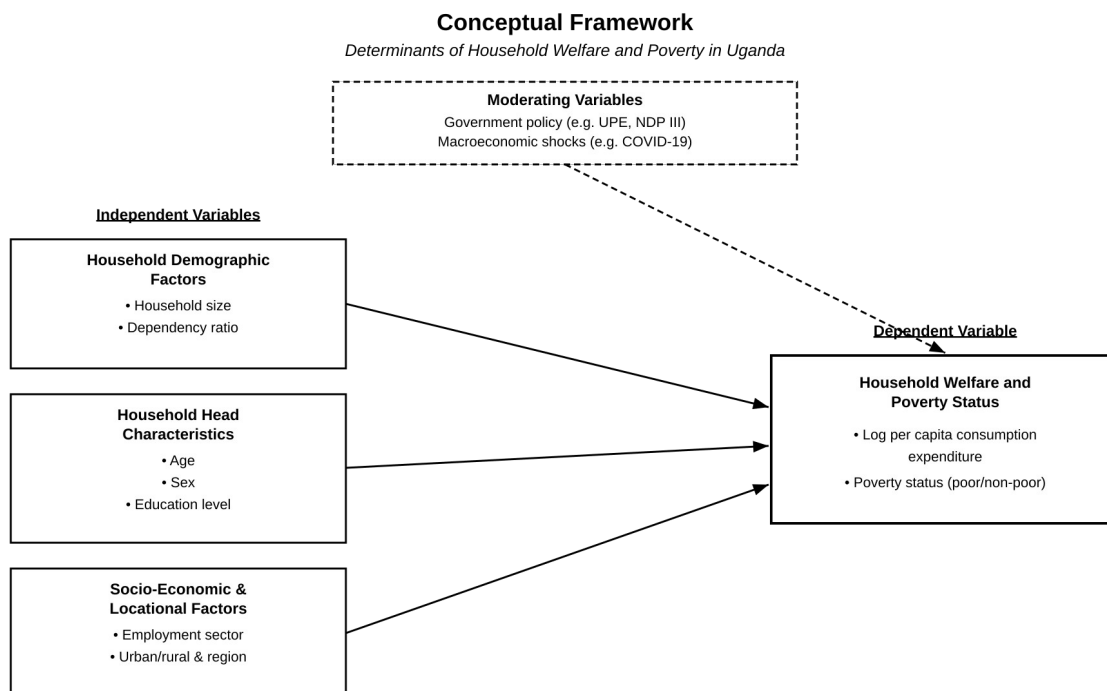
Two theoretical strands underpin this study. The first, human capital theory, traces back to Becker (1964) and rests on a fairly intuitive idea: that what a person invests in their own education, training, or health eventually shows up in how productive, and therefore how well-off, they become. For a household, this implies that the head's schooling should matter for how much the household is able to consume, whether through better-paid work or, in the largely agrarian Ugandan setting, through more productive farming (Appleton & Balihuta, 1996). This is the lens through which the study approaches its second objective, on the household head's education and its bearing on welfare.

The second strand comes from Sen (1999), whose capability approach pushes back against equating poverty with low income alone, arguing instead that what matters is whether people have the real freedom to live the kind of life they have reason to value, health, education, and security included. It is a compelling argument, but not one this study is well placed to test in full, given the time and data constraints that come with an undergraduate dissertation. What is more workable, and what the study adopts instead, is the cost-of-basic-needs method set out by Ravallion and Bidani (1994), which prices out a minimum food basket and adds an allowance for essential non-food spending to arrive at a monetary poverty line. This is, admittedly, a narrower measure than Sen would prefer, but it has the advantage of matching the approach UBOS itself uses in producing Uganda's official poverty statistics (UBOS, 2021), which keeps this study's results comparable to the national figures.

Between them, these two perspectives, human capital theory and a practical, consumption-based reading of welfare, justify the variables examined in the sections that follow: household composition, the characteristics of the household head, and the household's economic and geographic position.

## 2.2 Conceptual Framework

Figure 2.1 translates this thinking into a single picture. On the left are the three groups of independent variables that map onto the study's objectives: household demographic factors (size and dependency ratio), the household head's characteristics (age, sex, and education), and the household's socio-economic and locational position (employment sector, and whether it is urban or rural, and in which region). All three are expected to feed into the outcome on the right, household welfare and poverty status, measured here as the log of per capita consumption and as a simple poor or non-poor indicator. The dashed box at the top is a reminder that this is not the whole story: government policy, such as Universal Primary Education or the National Development Plan III, and shocks such as the COVID-19 pandemic, sit outside the regression model but can still shift how strongly, or in which direction, the other variables matter.



*Figure 2.1: Conceptual framework showing the relationship between household-level determinants and household welfare/poverty status. Source: Author's construction (2026), informed by Ravallion and Bidani (1994), Deininger and Okidi (2003), and Sen (1999).*

## **2.3 Empirical Literature Review**

### **2.3.1 Household Size and Dependency Ratio**

Few relationships in the poverty literature are as well established as the one between household size and welfare. Lanjouw and Ravallion (1995) showed, across a range of countries, that bigger households tend to report lower consumption per person, essentially because the extra mouths to feed outweigh whatever savings come from sharing a roof. Uganda fits this pattern: Deininger and Okidi (2003), tracking households between 1992 and 1999/2000, found household size pulling in the opposite direction from both income growth and poverty reduction. The same shows up further south; in a South African township, Sekhampu (2013) found household size raised the odds of being poor, alongside the age and job status of the household head.

What none of these studies quite settle is which way the causation runs. It could be that large households are poor because resources get stretched thin, or it could be that poorer households have more children in the first place, as a kind of insurance for old age or as extra hands for farm work. A cross-sectional design, including the one used here, cannot really pull these two stories apart, and that is worth flagging as a limitation up front rather than glossing over.

### **2.3.2 Household Head Characteristics**

Education is where human capital theory earns its keep most clearly. Appleton and Balihuta (1996) traced a direct line from schooling to higher agricultural productivity among Ugandan farmers, and Deininger and Okidi (2003) found education to be among the strongest predictors of which households climbed out of poverty between 1992 and 2000. The same story plays out beyond Uganda: studies drawing on the Ghana Living Standards Survey repeatedly find that household heads with tertiary education are far less likely to be poor than those who stopped at the basic level.

Age tells a less tidy story. Sekhampu (2013) found that older household heads were less likely to be poor, plausibly because age comes with more assets, experience, and social connections, but other work suggests the relationship may bend rather than run in a straight line across the life course, so it is not a finding to lean on too heavily.

Sex of the household head is where the literature pulls in genuinely different directions. The standard expectation, often summed up as the “feminization of poverty,” is that female-headed households fare worse. Appleton’s (1996) study of Uganda’s first nationally representative survey did not bear this out: female-headed households were not, on the whole, poorer than male-headed ones, though widows and female heads in urban areas were something of an exception, a gap Appleton traced mainly to lower educational attainment among women and to the cushioning effect of remittances. Elsewhere in the region, the opposite finding, that female headship raises poverty risk, turns up often enough that the Ugandan result looks more like a local exception than a universal rule. That tension is reason enough to re-test the relationship with more recent data, which is part of what this study sets out to do.

### ***2.3.3 Employment Sector and Location***

Where a household sits, both in the labour market and on the map, has long mattered for its welfare in Uganda. Deininger and Okidi (2003) tied household income growth closely to coffee and other agricultural prices, while the World Bank’s (2022) more recent assessment points to a slow but steady drift away from subsistence farming toward paid, non-farm work, mostly among households that were already better off or better educated. Geography compounds this: UBOS (2021) places poverty well above the national average in rural areas generally, and in the Northern region and Karamoja sub-region specifically, a picture the World Bank (2022) corroborates. The same divide shows up outside Uganda too; in Ghana, households working in agriculture and living in rural areas are consistently more likely to be poor in studies using the Ghana Living Standards Survey. Taken together, this is fairly strong grounds for treating employment sector and location as serious explanatory variables rather than afterthoughts.

## **2.4 Summary and Research Gap**

Put together, the literature reviewed here tells a fairly consistent story on three fronts: bigger households and heavier dependency burdens go with more poverty; an educated household head is a real buffer against it, much as human capital theory would predict; and working in agriculture, especially in rural areas and the North, raises the odds of being poor. The methods used to reach these conclusions have shifted over time, though. Older Ugandan work, Deininger and Okidi (2003) included, leaned on panel-data growth regressions, while more recent African studies, Sekhampu (2013) and the Ghana-based work among them, have tended toward logit or probit

models run on poverty status, often alongside an OLS model on consumption. That split is itself useful: it is the reason this study runs both an OLS model on log per capita consumption and a probit model on poverty status, so its findings can be set against either tradition.

Not everything lines up neatly, though. Appleton's (1996) finding that female household heads in Uganda were not consistently worse off sits awkwardly next to the "feminization of poverty" pattern found elsewhere in Africa, and the household-size story, while consistent in direction, is still unclear on cause and effect.

The bigger issue, for this study's purposes, is simply how old most of this evidence is. The studies that actually estimate these relationships statistically, rather than just describing them, mostly draw on data from well before 2010 (Deininger & Okidi, 2003; Appleton, 1996; Appleton & Balihuta, 1996; Lanjouw & Ravallion, 1995). UBOS (2021) and the World Bank (2022) have since published numbers from the 2019/20 survey round, but these are descriptive, headcount ratios, cross-tabulations, and the like, rather than a regression that isolates what each factor is actually doing once the others are held constant. That is the gap this study tries to close, using the most recent panel data available to put these long-standing relationships to the test again.

## **CHAPTER THREE: METHODOLOGY**

### **3.0 Introduction**

This chapter sets out how the study was carried out in practice: the research design adopted, the population the data represents and how it was sampled, where the data came from and how the key variables were measured, the regression models estimated, the software and diagnostic checks used, and the ethical and practical limitations that come with relying on existing survey data rather than data collected first-hand.

### **3.1 Research Design**

The study follows a quantitative, cross-sectional research design. A cross-sectional design draws on data collected at a single point in time and is well suited to examining how a set of explanatory variables, here, household size, dependency ratio, household head characteristics, employment sector, and location, relate to an outcome of interest, in this case household welfare and poverty status, across many households at once. This fits both the nature of the available data, since the 2019/20 round of the Uganda National Panel Survey (UNPS) was administered as a single annual round rather than tracked over multiple periods for this study's purposes, and the scope of an undergraduate dissertation, which does not have the time or resources to follow households over several years. The trade-off, discussed further under limitations, is that a cross-sectional design can establish association but not causation.

### **3.2 Study Population and Sampling**

#### ***3.2.1 Target Population***

The target population for this study is all households in Uganda, as represented by the households interviewed in the 2019/20 round of the UNPS. The survey was designed by the Uganda Bureau of Statistics (UBOS) to be nationally representative at the urban–rural and regional level, covering Central, Eastern, Northern, and Western Uganda (UBOS, 2021).

#### ***3.2.2 Sampling Technique and Sample Size***

Because this study uses secondary data, the sampling itself was carried out by UBOS. The UNPS sample was originally drawn using a stratified, multi-stage design: enumeration areas were selected within each stratum using probability-proportional-to-size sampling from the national

census frame, and households were then selected systematically within each enumeration area (UBOS, 2021). The panel has since been refreshed periodically to maintain its national representativeness as households move, split, or drop out over time. In the 2019/20 round, a total of 3,098 households were interviewed, of which 2,353 were rural and 745 urban. This sample size is large enough to support the regression analysis planned for this study, and is comparable to, or larger than, the sample sizes used in similar published studies on household poverty in the region (Sekhampu, 2013).

Because the unit of analysis is the household rather than the individual, no further sampling was carried out; the analysis simply uses all households in the dataset for which the relevant variables are available after merging. Households with missing values on any of the key variables used in the regression models are excluded from the relevant estimation sample, which is the only inclusion or exclusion criterion applied beyond what UBOS itself used in drawing the original sample.

### **3.3 Data Collection Methods and Sources**

This study relies entirely on secondary data, that is, data that has already been collected, cleaned, and documented by another organisation for a different original purpose, rather than data collected first-hand by the researcher (primary data). The data come from the 2019/20 UNPS, collected by UBOS using computer-assisted personal interviewing (CAPI), and distributed publicly, subject to a data-use agreement restricting use to non-commercial research, through the World Bank Microdata Library under reference UGA\_2019\_UNPS\_v03\_M.

Specifically, the study draws on the household roster module, which provides the demographic information needed to construct household size, the dependency ratio, and the age and sex of the household head; the education module, used to measure the household head's schooling; the labour force module, used to identify the household head's employment sector; the household identification module, which provides urban/rural and regional location; and the pre-constructed consumption and poverty aggregate file (pov2019\_20.dta), which provides per capita consumption expenditure and poverty status as computed by UBOS using the cost-of-basic-needs method (Ravallion & Bidani, 1994). These files are merged at the household level using the unique household identifier common to all UNPS data files.

Using secondary data of this kind has clear advantages for a study with a tight timeline: it avoids the cost and time of fielding a new survey, and it draws on data collected by a national statistical office using professionally trained enumerators and a nationally representative sample, which would be well beyond the reach of an undergraduate dissertation to replicate. The trade-off is that the researcher has no control over which questions were asked or how they were worded, a point returned to under limitations.

### 3.4 Model Specification

Two regression models are estimated, corresponding to the two ways household welfare is measured in this study. The first is an Ordinary Least Squares (OLS) regression of log per capita consumption expenditure on the explanatory variables described in Table 3.1:

$$\ln(PCE_i) = \beta_0 + \beta_1 HHSIZE_i + \beta_2 DEPRATIO_i + \beta_3 AGE_i + \beta_4 SEX_i + \beta_5 EDUC_i + \beta_6 AGRIC_i + \beta_7 URBAN_i + \beta_8 REGION_i + \varepsilon_i$$

where  $PCE_i$  is per capita consumption expenditure for household  $i$ , and  $\varepsilon_i$  is a stochastic error term assumed to be independently and identically distributed. The second model is a probit regression of poverty status on the same set of explanatory variables, used as a robustness check and to allow the results to be stated in terms of probabilities of being poor rather than only in terms of consumption levels:

$$Pr(POOR_i = 1) = \Phi(\alpha_0 + \alpha_1 HHSIZE_i + \alpha_2 DEPRATIO_i + \alpha_3 AGE_i + \alpha_4 SEX_i + \alpha_5 EDUC_i + \alpha_6 AGRIC_i + \alpha_7 URBAN_i + \alpha_8 REGION_i)$$

where  $\Phi(\cdot)$  is the standard normal cumulative distribution function. Running both models follows the same approach taken in the comparative literature reviewed in Chapter Two, where some studies model consumption directly with OLS (Deininger & Okidi, 2003) and others model poverty status with a probit or logit specification (Sekhampu, 2013), allowing this study's results to be set against both traditions.

Table 3.1 summarises how each variable is defined and measured, along with the sign each variable is expected to carry based on the theoretical and empirical literature reviewed in Chapter Two.

*Table 3.1: Definition and measurement of variables*

| Variable | Type | Measurement | Expected Sign |
|----------|------|-------------|---------------|
|----------|------|-------------|---------------|



|                                        |                    |                                                                                          |                    |
|----------------------------------------|--------------------|------------------------------------------------------------------------------------------|--------------------|
| Log per capita consumption expenditure | Dependent (OLS)    | Natural log of total household consumption expenditure divided by household size (UGX)   | —                  |
| Poverty status                         | Dependent (probit) | 1 if household per capita consumption falls below the national poverty line; 0 otherwise | —                  |
| Household size                         | Independent        | Number of household members                                                              | Negative           |
| Dependency ratio                       | Independent        | (Members aged under 15 + members aged 65 and above) ÷ household size                     | Negative           |
| Household head's age                   | Independent        | Age of household head in completed years                                                 | Positive           |
| Household head's sex                   | Independent        | 1 = Female; 0 = Male                                                                     | Ambiguous          |
| Household head's education             | Independent        | Years of completed schooling (or highest level attained)                                 | Positive           |
| Employment sector                      | Independent        | 1 = household head's main employment is in agriculture; 0 = otherwise                    | Negative           |
| Residence                              | Independent        | 1 = Urban; 0 = Rural                                                                     | Positive           |
| Region                                 | Independent        | Categorical: Central (reference), Eastern, Northern, Western                             | Northern: negative |

### 3.5 Data Analysis Techniques

Analysis proceeds in three stages. The first is descriptive: summary statistics (means, standard deviations, and frequencies) are computed for all variables to profile the sample and check for implausible values before any regression is run. The second is the estimation of the OLS and probit models specified above. For the probit model, average marginal effects are computed and reported alongside the raw coefficients, since probit coefficients on their own do not have a direct, intuitive interpretation (Greene, 2012).

The third stage is diagnostic checking, the details of which are set out in Section 3.6. In brief, Variance Inflation Factors (VIFs) are used to check for problematic multicollinearity, the Breusch–Pagan test is used to detect heteroskedasticity, and model fit is assessed using the adjusted R-squared for the OLS model and the pseudo-R-squared for the probit model. All analysis is carried out in Stata.

### 3.6 Diagnostic Tests

Before estimating and interpreting the regression models, a set of diagnostic tests is applied to verify that the classical assumptions underlying OLS are not violated. Violating these assumptions can result in biased or inefficient estimates, unreliable standard errors, and misleading conclusions. Three diagnostic procedures are employed in this study.

### ***3.6.1 Multicollinearity Check (VIF)***

Multicollinearity refers to a situation where two or more independent variables in a regression model are highly correlated with one another. When this occurs, the model cannot accurately isolate the individual effect of each variable on the dependent variable, and the estimated standard errors of the correlated coefficients become inflated, making variables appear insignificant even when they are not. To check for multicollinearity, this study computes the Variance Inflation Factor (VIF) for each explanatory variable after estimating the OLS model. The VIF quantifies how much the variance of an estimated coefficient is increased due to collinearity with the other regressors. Conventionally, a VIF below 5 is considered unproblematic, values between 5 and 10 signal moderate concern, and a VIF above 10 indicates severe multicollinearity that warrants corrective action such as dropping or combining variables (Gujarati & Porter, 2009). Particular attention is paid to the relationship between household size and the dependency ratio, as both are derived from the household roster and could be more closely correlated than is desirable. If any VIF exceeds 5, the variables involved will be examined more carefully and, if necessary, one will be dropped from the model.

### ***3.6.2 Heteroskedasticity Test (Breusch–Pagan)***

A core assumption of OLS regression is that the variance of the error term is constant across all observations, a property called homoskedasticity. When this assumption is violated and the error variance differs systematically across observations or subgroups, the model is said to be heteroskedastic. Heteroskedasticity does not bias the regression coefficients themselves, but it renders the conventional OLS standard errors incorrect: depending on the pattern of the heteroskedasticity, standard errors may be understated or overstated, leading to hypothesis tests that are either too liberal or too conservative. Heteroskedasticity is particularly common in cross-sectional household welfare data, where consumption expenditure tends to be more variable among wealthier households than among poorer ones. To detect it, the Breusch–Pagan test is applied to the OLS residuals. The test regresses the squared residuals on the original regressors and tests the null

hypothesis that the error variance is constant. If the null is rejected (i.e.,  $p < 0.05$ ), the presence of heteroskedasticity is confirmed and heteroskedasticity-robust (Huber-White) standard errors are used in place of conventional standard errors. These robust standard errors are asymptotically valid and do not affect the point estimates of the coefficients; they correct only the precision with which those estimates are tested (Gujarati & Porter, 2009).

### **3.6.3 Model Fit Assessment**

The overall fit of each model is assessed using appropriate goodness-of-fit statistics. For the OLS model, the adjusted R-squared is reported, which measures the proportion of variation in log per capita consumption expenditure explained by the regressors, penalising for the number of variables included in order to avoid overstating fit as more variables are added. For the probit model, McFadden's pseudo-R-squared is reported, which compares the log-likelihood of the fitted model to that of a model with only a constant. Unlike the OLS R-squared, the pseudo-R-squared does not have a direct interpretation as the share of variance explained; values in the range of 0.2 to 0.4 are generally considered to represent a reasonably good fit for a binary-outcome model (Greene, 2012). Additionally, the overall significance of the OLS model is assessed using an F-test, and that of the probit model using a likelihood ratio chi-squared test, both of which test the joint null hypothesis that all slope coefficients are simultaneously equal to zero.

## **3.7 Ethical Considerations**

Because this study uses secondary, already-anonymised survey data rather than collecting information directly from respondents, it does not require separate informed consent or a fresh institutional ethics review of the kind needed for primary data collection: that responsibility lies with UBOS and the World Bank as the original data collectors and distributors, and the UNPS was carried out under their own ethical clearance and consent procedures. The researcher's ethical obligations are correspondingly narrower but still real: access to the data was obtained through a formal registration and request process with the World Bank Microdata Library, and its use is governed by the accompanying data-use agreement, which restricts use to non-commercial academic research, prohibits any attempt to identify individual households or persons, and requires that only aggregated, anonymised results be reported, all of which this study adheres to.

## **3.8 Limitations of the Study**

Several limitations follow directly from the design choices described above. First, the cross-sectional design means the results can show association but not establish causation; for instance, a negative relationship between household size and welfare is consistent with both the explanation that large households dilute resources and the explanation that poorer households choose to have more children, and this data cannot distinguish between the two, a point already flagged in Chapter Two. Second, consumption expenditure in household surveys is typically based on respondent recall over a reference period, which introduces some measurement error that is difficult to fully correct for. Third, as with any model, there is a risk of omitted variable bias from unobserved household characteristics, such as ability, health shocks, or access to informal credit and remittances, that are not captured in the available modules but may independently affect both the explanatory variables and household welfare. Fourth, because the data was collected during 2019/20, a period that straddled the onset of the COVID-19 pandemic, the estimated relationships should be interpreted as describing that specific period and may not fully generalise to more typical, non-pandemic years. Finally, relying on secondary data means the researcher had no influence over how variables were defined or which questions were asked, so the analysis is necessarily confined to the variables the survey actually collected.

## CHAPTER FOUR: ANALYSIS, INTERPRETATION AND DISCUSSION OF RESULTS

### 4.1 Introduction

This chapter presents and interprets the results of the analysis described in Chapter Three, in line with the study's objectives. Section 4.2 presents descriptive statistics, covering the demographic and socio-economic profile of the sampled households as well as the distribution of poverty status. Section 4.3 examines the trends and patterns of the study variables, including the bivariate relationship between household characteristics and poverty status. Section 4.4 presents and interprets the diagnostic tests conducted before estimation. Section 4.5 presents the regression modelling results, covering both the OLS and probit specifications. Section 4.6 discusses the findings in relation to the study's objectives and the literature reviewed in Chapter Two. All analyses were performed using Stata.

### 4.2 Descriptive Analysis

Table 4.1 shows the distribution of the 3,062 households in the analytic sample according to the sex of the household head, residence, region, the head's employment sector, the head's education level, and household size.

#### 4.2.1 Demographic and Socio-Economic Profile of Sampled Households

Table 4.1: Distribution of Sampled Households by Demographic and Socio-Economic Characteristics ( $n = 3,062$ )

| Variable                 | Category      | n    | Percentage (%) |
|--------------------------|---------------|------|----------------|
| Sex of household head    | Male          | 1973 | 64.4           |
|                          | Female        | 1089 | 35.6           |
| Residence                | Rural         | 2320 | 75.8           |
|                          | Urban         | 742  | 24.2           |
| Region                   | Central       | 782  | 25.5           |
|                          | Eastern       | 700  | 22.9           |
|                          | Northern      | 862  | 28.2           |
|                          | Western       | 718  | 23.4           |
| Head's employment sector | Other sectors | 1383 | 45.2           |
|                          | Agriculture   | 1679 | 54.8           |
| Head's education level   | None          | 413  | 13.5           |
|                          | Primary       | 1694 | 55.3           |

|                |                    |      |      |
|----------------|--------------------|------|------|
|                | Secondary          | 741  | 24.2 |
|                | Tertiary and above | 214  | 7.0  |
| Household size | Small (1–4)        | 1509 | 49.3 |
|                | Medium (5–7)       | 1131 | 36.9 |
|                | Large (8+)         | 422  | 13.8 |

From Table 4.1, the majority of sampled households were headed by males (64.4%), while 35.6 percent were headed by females. Most households were rural (75.8%), with only 24.2 percent classified as urban. The Northern region had the highest share of households (28.2%), followed by Central (25.5%), Western (23.4%), and Eastern (22.9%). Slightly more than half of household heads (54.8%) were mainly employed in agriculture. With regard to education, the majority of heads had attained only primary-level education (55.3%), while 13.5 percent had no formal education at all and only 7.0 percent had attained tertiary education or higher. Households of small size (1–4 members) were the most common (49.3%), followed by medium-sized households (36.9%), with large households of 8 or more members being the least common (13.8%).

#### ***4.2.2 Distribution of Household Poverty Status***

Table 4.2 shows the distribution of sampled households by poverty status, based on the cost-of-basic-needs poverty line constructed by UBOS for the 2019/20 survey round.

*Table 4.2: Distribution of Household Poverty Status (n = 3,062)*

| <b>Poverty Status</b> | <b>n</b> | <b>Percentage (%)</b> |
|-----------------------|----------|-----------------------|
| Non-poor              | 2635     | 86.1                  |
| Poor                  | 427      | 13.9                  |

From Table 4.2, the majority of sampled households (86.1%) were non-poor, while 13.9 percent were classified as poor. As discussed in Section 4.2 of this chapter and the note in Chapter Three, this figure is lower than UBOS’s (2021) headline national poverty rate of 20.3 percent for the same survey round, most plausibly because the panel poverty file used here prices the poverty line in 2009/10 constant terms and because panel households are subject to some differential attrition over time. With that caveat in mind, the relative patterns of poverty across the categories examined next remain informative.

### 4.3 Trends and Patterns of Study Variables

Table 4.3 presents the bivariate relationship between poverty status and each of the household characteristics examined in this study, tested using the chi-square statistic.

*Table 4.3: Household Poverty Status by Demographic and Socio-Economic Characteristics (n = 3,062)*

| Variable          | Category      | n    | % Non-poor | % Poor | Chi-square test              |
|-------------------|---------------|------|------------|--------|------------------------------|
| Sex of head       | Male          | 1973 | 86.6       | 13.4   | $\chi^2=1.344$ , $p=0.246$   |
|                   | Female        | 1089 | 85.0       | 15.0   |                              |
| Residence         | Rural         | 2320 | 83.3       | 16.7   | $\chi^2=58.779$ , $p<0.001$  |
|                   | Urban         | 742  | 94.6       | 5.4    |                              |
| Employment sector | Other sectors | 1383 | 89.5       | 10.5   | $\chi^2=24.648$ , $p<0.001$  |
|                   | Agriculture   | 1679 | 83.2       | 16.8   |                              |
| Region            | Central       | 782  | 96.4       | 3.6    | $\chi^2=156.073$ , $p<0.001$ |
|                   | Eastern       | 700  | 81.6       | 18.4   |                              |
|                   | Northern      | 862  | 76.7       | 23.3   |                              |
|                   | Western       | 718  | 90.4       | 9.6    |                              |
| Education level   | None          | 413  | 71.2       | 28.8   | $\chi^2=144.526$ , $p<0.001$ |
|                   | Primary       | 1694 | 84.6       | 15.4   |                              |
|                   | Secondary     | 741  | 94.6       | 5.4    |                              |
|                   | Tertiary+     | 214  | 96.7       | 3.3    |                              |
| Household size    | Small (1–4)   | 1509 | 94.0       | 6.0    | $\chi^2=204.739$ , $p<0.001$ |
|                   | Medium (5–7)  | 1131 | 82.1       | 17.9   |                              |
|                   | Large (8+)    | 422  | 68.2       | 31.8   |                              |

From Table 4.3, the poverty rate was only marginally higher among female-headed households (15.0%) than male-headed households (13.4%), and this difference was not statistically significant ( $\chi^2=1.344$ ,  $p=0.246$ ). Poverty was considerably more common among rural households (16.7%) than urban households (5.4%), a difference that was highly significant ( $\chi^2=58.779$ ,  $p<0.001$ ). Households whose heads worked in agriculture had a higher poverty rate (16.8%) than those in other sectors (10.5%) ( $\chi^2=24.648$ ,  $p<0.001$ ). Poverty also varied sharply by region, ranging from just 3.6 percent in Central to 23.3 percent in the Northern region ( $\chi^2=156.073$ ,  $p<0.001$ ), and fell steadily as the household head's education rose, from 28.8 percent among heads with no education to 3.3 percent among those with tertiary education ( $\chi^2=144.526$ ,  $p<0.001$ ). Poverty also rose steadily with household size, from 6.0 percent among small households to 31.8 percent among

large households ( $\chi^2=204.739$ ,  $p<0.001$ ). All of these relationships, except for the sex of the household head, were statistically significant at the 1 percent level, and are examined further in the multivariate models that follow.

## 4.4 Diagnostics

Before estimating and interpreting the regression models, a set of diagnostic tests was performed to verify that the assumptions underlying Ordinary Least Squares (OLS) estimation were not violated. Failing to check and address these assumptions can lead to biased coefficients, inflated or deflated standard errors, and unreliable hypothesis tests. Three core assumptions were examined: the absence of problematic multicollinearity among the independent variables, the presence or absence of heteroskedasticity in the error term, and the overall goodness of fit of the model.

### 4.4.1 Test for Multicollinearity

Multicollinearity arises when two or more independent variables in a regression model are highly correlated with each other, making it difficult for the model to distinguish the individual contribution of each variable to the outcome. In its severe form, multicollinearity inflates the standard errors of the affected coefficients, making them appear statistically insignificant even when a genuine relationship exists. The conventional diagnostic for multicollinearity is the Variance Inflation Factor (VIF), which measures how much the variance of an estimated regression coefficient is inflated due to collinearity with the other predictors. A VIF value above 10 is widely regarded as indicating problematic multicollinearity, while values below 5 are considered acceptable (Gujarati & Porter, 2009). There was a particular concern in this study about the relationship between household size and the dependency ratio, since both variables are constructed from the same household roster information, raising the possibility that they might be too closely correlated to estimate independently. The VIF results for all ten explanatory variables are presented in Table 4.4 below.

*Table 4.4: Variance Inflation Factors (VIF)*

| Variable         | VIF  |
|------------------|------|
| Household size   | 1.18 |
| Dependency ratio | 1.14 |
| Head's age       | 1.12 |
| Head is female   | 1.20 |



|                              |      |
|------------------------------|------|
| Head's years of schooling    | 1.39 |
| Head employed in agriculture | 1.22 |
| Urban residence              | 1.34 |
| Eastern region               | 1.62 |
| Northern region              | 1.63 |
| Western region               | 1.55 |

As shown in Table 4.4, all VIF values fall well below the conventional threshold of 5 (ranging from 1.12 to 1.63), confirming that multicollinearity is not a material concern in this model. The modest VIFs for household size (1.18) and the dependency ratio (1.14) are particularly reassuring, indicating that, despite both variables being derived from the household roster, they carry sufficiently distinct information to be estimated separately. The region dummies record the highest VIF values (ranging from 1.55 to 1.63), which is expected given that geographic regions tend to be correlated with several household characteristics, but these values remain comfortably below the threshold for concern. The absence of problematic multicollinearity means the estimated coefficients can be interpreted as the independent effect of each variable, holding the others constant, without the risk of severe estimation instability.

#### ***4.4.2 Test for Heteroskedasticity***

Heteroskedasticity occurs when the variance of the error term in a regression model is not constant across all values of the independent variables. It is a common problem in cross-sectional household surveys, where variation in the outcome variable tends to differ systematically across subgroups: for example, consumption expenditure may be far more variable among wealthier households than among poorer ones. When heteroskedasticity is present, the OLS estimates of the regression coefficients remain unbiased, but the standard errors are incorrect. Specifically, heteroskedasticity causes conventional standard errors to be either too small or too large, leading to hypothesis tests that over-reject or under-reject the null, and therefore producing misleading inference about which variables are statistically significant. The standard diagnostic for detecting heteroskedasticity is the Breusch–Pagan test, which tests the null hypothesis that the error variance is constant (homoskedastic) against the alternative that it varies systematically with the regressors. Rejection of the null hypothesis signals the need to use heteroskedasticity-robust standard errors, which are asymptotically valid regardless of the pattern of heteroskedasticity (Gujarati & Porter, 2009).

A Breusch–Pagan test for heteroskedasticity returned a test statistic of 75.01 on 10 degrees of freedom ( $p < 0.001$ ), strongly rejecting the null hypothesis of constant error variance. This result confirms that heteroskedasticity is present in the OLS model, which is not surprising given the well-documented tendency for household consumption expenditure to exhibit greater spread at higher income levels. In practical terms, this means that if conventional standard errors were used, some variables could appear to be statistically significant when they are not, or vice versa. To correct for this, heteroskedasticity-robust (Huber-White) standard errors are used throughout the OLS estimation, as reported in Table 4.5. These robust standard errors are the standard practice in applied household welfare analysis and do not affect the point estimates of the coefficients, only the precision with which they are estimated and tested.

## 4.5 Modelling: Regression Results

This section presents the results of the two regression models estimated in this study. The first is an OLS regression of log per capita consumption expenditure on the explanatory variables, which captures how each factor is associated with average household welfare. The second is a probit regression of poverty status (a binary outcome) on the same set of variables, reported with average marginal effects to allow direct probabilistic interpretation. Running both models follows the approach of the comparative literature reviewed in Chapter Two, where OLS on consumption and probit on poverty status are often estimated together to provide a more complete picture of household welfare determinants (Deininger & Okidi, 2003; Sekhampu, 2013).

### 4.5.1 Determinants of Household Welfare

*Table 4.5: OLS Regression of Log Per Capita Welfare ( $n = 3,062$ )*

| Variable                     | Coefficient | Robust SE |
|------------------------------|-------------|-----------|
| Constant                     | 11.4838***  | (0.0560)  |
| Household size               | -0.0959***  | (0.0042)  |
| Dependency ratio             | -0.1700***  | (0.0416)  |
| Head's age                   | 0.0056***   | (0.0007)  |
| Head is female               | 0.0510**    | (0.0229)  |
| Head's years of schooling    | 0.0580***   | (0.0031)  |
| Head employed in agriculture | -0.0803***  | (0.0225)  |
| Urban residence              | 0.2470***   | (0.0277)  |
| Eastern region               | -0.3484***  | (0.0293)  |

|                 |            |          |
|-----------------|------------|----------|
| Northern region | -0.4570*** | (0.0290) |
| Western region  | -0.1749*** | (0.0287) |

Note: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Dependent variable is the natural log of per capita household welfare.  $R^2 = 0.448$ , Adjusted  $R^2 = 0.447$ ,  $F(10, 3051) = 247.99$  ( $p < 0.001$ ).

Table 4.5 shows that all ten variables were significantly related to household welfare. Household size ( $\beta = -0.096$ ) and the dependency ratio ( $\beta = -0.170$ ) were both negatively related to welfare, while the head's age ( $\beta = 0.006$ ), sex ( $\beta = 0.051$ ), and years of schooling ( $\beta = 0.058$ ) were all positively related to welfare. Agricultural employment ( $\beta = -0.080$ ) was negatively related to welfare, while urban residence ( $\beta = 0.247$ ) was positively related to welfare. All three region dummies were negative relative to Central, with the Northern region carrying the largest penalty ( $\beta = -0.457$ ). The model explains 44.8 percent of the variation in log per capita welfare ( $R^2 = 0.448$ ), which is a good fit for a cross-sectional household welfare model of this kind.

#### 4.5.2 Determinants of Poverty Status

Table 4.6: Probit Regression of Poverty Status, with Average Marginal Effects ( $n = 3,062$ )

| Variable                     | Coefficient | SE       | Avg. Marginal Effect |
|------------------------------|-------------|----------|----------------------|
| Constant                     | -1.7389***  | (0.1955) | —                    |
| Household size               | 0.1602***   | (0.0126) | 0.0285               |
| Dependency ratio             | 0.0309      | (0.1426) | 0.0055               |
| Head's age                   | -0.0051**   | (0.0022) | -0.0009              |
| Head is female               | -0.0008     | (0.0741) | -0.0001              |
| Head's years of schooling    | -0.1052***  | (0.0104) | -0.0187              |
| Head employed in agriculture | 0.0695      | (0.0688) | 0.0124               |
| Urban residence              | -0.2280**   | (0.1015) | -0.0406              |
| Eastern region               | 0.6741***   | (0.1129) | 0.1199               |
| Northern region              | 0.9041***   | (0.1075) | 0.1608               |
| Western region               | 0.3028**    | (0.1186) | 0.0539               |

Note: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Dependent variable equals 1 if the household is poor, 0 otherwise. Pseudo  $R^2$  (McFadden) = 0.204, LR  $\chi^2(10) = 504.37$  ( $p < 0.001$ ).

Table 4.6 shows that household size, the head's age and years of schooling, urban residence, and all three region dummies were significant predictors of poverty status. The dependency ratio, the head's sex, and agricultural employment were not statistically significant in this model, even though all three had shown a significant bivariate relationship with poverty in Table 4.3 (with the exception of sex, which was not significant there either). This suggests that, once household size,

education, and location are accounted for, the dependency ratio and employment sector add little further explanatory power on their own. The model correctly explains a substantial share of the variation in poverty status (Pseudo  $R^2=0.204$ ), and the overall model is highly significant (LR  $\chi^2(10)=504.37$ ,  $p<0.001$ ).

#### **4.6 Discussion of Key findings**

Household size was the most consistent demographic predictor of welfare in this study. Table 4.3 showed poverty rising steadily with household size, from 6.0 percent in small households to 31.8 percent in large households, and this pattern was confirmed in both regression models: each additional household member reduced per capita welfare by about 9.1 percent and raised the probability of poverty by 2.9 percentage points. This finding agrees with Lanjouw and Ravallion (1995), who found a similar relationship across several countries, and with Deininger and Okidi (2003), who identified household size as one of the strongest predictors of poverty reduction in Uganda. The dependency ratio behaved similarly in the OLS model but lost significance in the probit model, suggesting that its effect on poverty status works mainly through household size rather than independently of it.

The household head's education had the strongest and most consistent relationship with welfare of any variable in the study. Poverty fell from 28.8 percent among heads with no education to just 3.3 percent among those with tertiary education (Table 4.3), and the regression results confirmed this, with each additional year of schooling raising welfare by about 6.0 percent and lowering the probability of poverty by 1.9 percentage points. This result agrees closely with Appleton and Balihuta (1996), who found that education raised agricultural productivity among Ugandan households, and with Deininger and Okidi (2003), who identified education as among the strongest determinants of poverty reduction in their study of Uganda. The head's age was also significantly, though modestly, related to welfare in the expected direction in both models.

The head's sex showed no significant bivariate relationship with poverty status ( $\chi^2=1.344$ ,  $p=0.246$ ) and no significant effect in the probit model, although it was weakly significant and positive in the OLS model. In other words, this study found no evidence that female-headed households in Uganda are disadvantaged relative to male-headed households; if anything, the opposite was weakly true for continuous welfare. This result agrees with Appleton (1996), who

similarly found, using Uganda's first nationally representative household survey, that female-headed households were not consistently poorer than male-headed households once other characteristics were taken into account.

Employment sector and location were both significantly related to welfare, though they behaved differently across the two models. Households whose heads worked in agriculture had a higher poverty rate (16.8%) than those in other sectors (10.5%) (Table 4.3), and the OLS results confirmed a significant welfare penalty of about 7.7 percent for agricultural households, consistent with the World Bank (2022), which found that better-off Ugandan households have increasingly moved away from subsistence farming. However, agricultural employment was not a significant predictor of poverty status in the probit model, suggesting that its effect on average welfare does not always carry through to a significant change in the probability of falling below the poverty line specifically.

Location showed the strongest relationship with welfare of any variable examined in this study. Poverty ranged from 3.6 percent in Central to 23.3 percent in the Northern region (Table 4.3), and the regression models confirmed this pattern, with the Northern region carrying both the largest welfare penalty (-36.7%) and the largest poverty risk (+16.1 percentage points) of any variable in the entire analysis. This finding is consistent with UBOS (2021) and the World Bank (2022), both of which identify Northern Uganda, and the Karamoja sub-region in particular, as the country's most persistently poor area.

## **CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### **5.0 Introduction**

This final chapter draws together the findings reported in Chapter Four. It summarises what was found against each of the three specific objectives set out in Chapter One, states the conclusions that follow from those findings, sets out a small number of policy recommendations, revisits the study's main limitations, and suggests directions a future study could take.

### **5.1 Summary of Key Findings**

On the first objective, household size proved to be one of the most robust results in the entire study. The bivariate analysis in Chapter Four (Table 4.3) showed poverty rising steadily from 6.0 percent in small households to 31.8 percent in large households, and this pattern held up in both regression models, where household size was significantly associated with lower welfare and a higher probability of poverty, confirming a relationship that has held up in Uganda since at least Deininger and Okidi's (2003) work nearly two decades earlier. The dependency ratio added a further welfare penalty in the OLS model but did not significantly predict poverty status on its own, suggesting that household size carries most of the weight once both variables are considered together.

On the second objective, the household head's education was, without much competition, the strongest and most dependable determinant among the head's characteristics. The cross-tabulation in Chapter Four showed poverty falling from 28.8 percent among heads with no education to 3.3 percent among those with tertiary education, and this gradient was confirmed in both regression models, where education reduced the probability of poverty and raised welfare cleanly across both specifications. Age mattered too, modestly and in the expected direction. The head's sex did not: it showed no significant bivariate relationship with poverty status ( $\chi^2=1.344$ ,  $p=0.246$ ) and no significant effect in the probit model, with only a small, positive association with continuous welfare, directly echoing Appleton's (1996) finding from Uganda's first nationally representative survey that female household headship is not, on its own, a marker of disadvantage.

On the third objective, location did more work than almost anything else in the analysis, at every stage of the evidence. The bivariate poverty rate ranged from 3.6 percent in Central to 23.3 percent in the Northern region, and the regression models confirmed this, with the Northern region

carrying the single largest poverty penalty found anywhere in the study, in line with the geographic poverty profile UBOS (2021) and the World Bank (2022) both describe. Employment in agriculture showed a significant bivariate and OLS relationship with lower welfare but did not significantly predict poverty status in the probit model, a more qualified result than the location findings.

## **5.2 Conclusions**

Taken as a whole, the evidence suggests that household welfare and poverty in Uganda continue to be shaped primarily by demographic composition, the household head's education, and geography, and that these patterns have persisted across roughly three decades of survey rounds, from Appleton and Balihuta's (1996) early evidence through to this study's use of the 2019/20 panel. That persistence points to structural rather than transient drivers of poverty, the kind that are unlikely to respond to short-term measures alone.

A second conclusion follows from what this study did not find significant: the sex of the household head is not, on this evidence, a reliable marker of poverty risk in Uganda. This matters for how vulnerability is identified in practice, since policy and programme design sometimes treats female household headship as a proxy for disadvantage by default. The data used here does not support that assumption, and policy design built on more direct indicators, education, location, household size, is likely to target real vulnerability more accurately.

A third conclusion concerns geography. The sheer size of the Northern region effect, easily the largest in the study, suggests that uniform, nationally-flat interventions are likely to under-serve the households that need help most, and that continued, sustained regional targeting remains warranted.

## **5.3 Recommendations**

Based on these conclusions, four recommendations follow. First, continued and, where possible, expanded investment in education, particularly in improving the quality of and post-primary continuation from the schooling already provided through programmes such as Universal Primary Education, is justified by the consistent, sizeable welfare returns to education found throughout this study. Second, given the strength of the household-size effect, continued investment in family

planning and reproductive health services would help households manage dependency burdens that this study finds to be a genuine drag on welfare. Third, the scale of the Northern region penalty found here supports continued, and ideally increased, prioritisation of that region and other lagging areas in budget allocation, infrastructure, and service delivery, consistent with recommendations already made by the World Bank (2022). Fourth, social protection and poverty-targeting programmes should be cautious about using the sex of the household head as a targeting criterion on its own; this study's results suggest that doing so risks misallocating resources away from genuinely vulnerable households, whether male- or female-headed, that share other characteristics, such as low education or location in a lagging region, that this study finds to matter more.

#### **5.4 Limitations of the Study**

As discussed more fully in Chapter Three, this study's cross-sectional design means its results describe association rather than causation, and its reliance on existing secondary data and recall-based consumption measures introduces some unavoidable measurement error that the researcher could not directly verify or correct. Chapter Four's finding that this study's sample poverty rate diverges from the headline national figure is a further reason for some caution: the absolute poverty levels reported here should be read carefully, even though the relationships among variables, which are the main object of this study, remain informative and internally consistent.

#### **5.5 Areas for Further Research**

Three extensions would be worth pursuing with more time and data access than this dissertation allowed. The first is to exploit the full multi-wave UNPS panel, rather than a single cross-section, to estimate household fixed-effects models that could speak more directly to causation rather than association. The second is to disaggregate the broad agriculture employment category used here into subsistence and more commercially oriented farming, since this study's contrasting OLS and probit results for agriculture suggest that distinction may matter. The third, following Sen's (1999) capability approach discussed in Chapter Two, is to complement the monetary welfare measure used in this study with non-monetary or multidimensional indicators of poverty, which the data and time available here did not allow but which could offer a fuller picture of household wellbeing in Uganda.



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