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INFORMAL HOUSEHOLD ENTERPRISES AND POVERTY NEXUS IN NIGERIA

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1. INTRODUCTION

1.1 Background

The dichotomy between “formality” and “informality” has been a major discourse at the heart of the development literature since the 19th century stemming from the concept of economic dualism credited mainly to Arthur Lewis (1954) and his model of dualism (the two-sector model of development). The model makes a distinction between the “modern” (formal) sector and the “traditional” (informal) sector. It further predicts that as growth occurs in an economy, the modern sector would continue to expand through investments which will cause the traditional sector to shrink as more labour would be absorbed into the formal sector. In other words, the informal sector is expected to disappear with development (Kanbur, 2017). Contrary to this prediction, the informal sector has been on the rise persistently.

Although, this is a global phenomenon with the informal sector employing over two billion of the world’s population (61.2% of global employment), it is more prominent in developing countries in Africa, Asia and the Pacific, as well as the Arab states. In Africa, the informal sector is the main source of employment with over 70 per cent share of non-agricultural employment and particularly in sub-Saharan Africa (SSA) where the share of informal sector employment (excluding agriculture) is largest (76.8 per cent). Specifically, it is estimated at 78.8 per cent in Central Africa, 76.6 per cent in Eastern Africa, 87 per cent in Western Africa and the lowest share being in the Southern African region with 36.1 per cent (ILO, 2018).

Aside its role in employment, the informal sector also helps in absorbing the excess labour arising from rural-urban migration (Mbaye and Benjamin, 2014) and in countries without any form of unemployment benefits or insurance, informal sector employment serves as the only alternative to remaining unemployed. In addition, informal sector activities such as unpaid work in a family enterprise, street vending, casual wage labour e.t.c. often serve as the main

and only means of survival and livelihood for the poor (ILO, 2013). Evidence shows that women tend to be more engaged in these activities with over 89 percent of women compared to about 80 percent of men (ILO, 2018). These are pointers to the fact that the informal sector may have a crucial role to play in poverty reduction although, its role in development has remained controversial (La Porta and Shleifer, 2014; Fox and Sohnesen, 2016).

Policy concerns about informality center around its association with low productivity and poverty as well as its constrain on the scope of public finance which are threats to sustainable development (La Porta and Shleifer, 2014; Kanbur, 2017; ILO, 2018). Evidence suggests that an enormous productivity gap exists between formal and informal enterprises and it's mostly associated with the human capital of the owners/operators, size of the enterprise as well as access to finance (La Porta and Shleifer, 2014; Benjamin et. al, 2014; Kanbur, 2017;Laoyza, 2018).Moreover, many of those engaged in the informal sector are trapped in the poverty cycle because despite the fact that it is in most cases their main and only source of livelihood (mostly for the poor), the income generated are exhausted daily trying to make ends meet, thereby limiting their ability to save and grow the business (ILO, 2013; World Development Report, 2019). Even worse is the fact that most of the people involved in these activities are uneducated, unbanked and even lack access to finance given their inability to provide necessary collateral required by banks. These concerns, however, show that reducing informality and improving the means of livelihood of those in the informal sector can be instrumental to sustainable development given the large population of people engaged in the informal sector. Hence, policies to address these issues are necessary for improving the productivity of informal sector activities and an effective transition from informality to formality.

However, a major consensus that exists in the literature is about the heterogeneous nature of the informal sector implying that in order to implement effective policies to address informality, a proper understanding of the informal sector and its continuum of characteristics

is very crucial. Using registration as a criteria for distinction between the formal and informal sector, Kanbur (2017) categorizes the informal sector into three; “the evaders” (those who are covered by regulation but do not comply), “the avoiders” (enterprises who adjust out of the coverage of the regulation) and “the outsiders” (these are enterprises who are outside the coverage of regulation). In particular, “the outsiders” comprise of enterprises whose natural size is less than the minimum required for registration. Typical actors in this category are household and micro enterprises which consist of street vendors, food sellers, hairdressers and barbers, furniture makers, shoemakers and cobblers, e.t.c. According to Kanbur (2017), this category holds the largest share of informal sector activities in most developing countries and may account for most of the persistence of informality over the years. Evidence from SSA shows that majority of employment in the informal sector are in household-based activities particularly in household nonfarm enterprises and it is projected to account for about 38 per cent of new jobs created between 2010 and 2020(La Porta and Shleifer, 2014; Fox and Sohnesen, 2016).

Given the central role of policy for effective transition to the formal economy, it is imperative to have an evidence-based understanding of the informal sector taking into account its inherent heterogeneity.

1.2 Statement of the Problem

Nigeria, currently the most populous country in Africa, is home to a population of about 202 million people and one of the largest youth populations in the world (World Bank, 2019). In terms of growth, the country has recorded some impressive records over the years with an average GDP growth rate of 5.7% between 2006 and 2016 and currently estimated at 2.55% as at the fourth quarter of 2019 (National Bureau of Statistics, 2019). However, contrary to the predictions of theory, in spite of her growth records, the informal sector in Nigeria has been

burgeoning over the years. It is estimated that of the 77 million working age employed Nigerians, about 72 percent (56 million) are engaged in the informal sector, more than half of which is of low productivity (World Bank, 2015; NBS, 2018). Of this number, statistics show that more women were engaged in non-farm household enterprises than men and women were predominant in retail trade as well as accommodation and food services compared to the men who were predominantly engaged in manufacturing, agriculture and construction (NBS, 2018).

Although, it is a fact that majority of Nigerians do work, a whole lot of them are engaged in low productivity informal employment, particularly household nonfarm enterprises where income generated is meant for daily survival and hence barely enough to enable them escape poverty. Estimates by the National Bureau of Statistics (NBS) reveal that over 60 per cent of these enterprises operate with an initial start-up capital of less than ₦50,000 (\$138 US) and an average monthly turnover of same amount indicative of the low level of productivity of these enterprises (NBS, 2017). Moreover, these activities contribute to the persistent existence of slums and unhealthy living environments in the various cities of the country as well as an increasing number of out of school children. With about 34 per cent of children estimated to be out of school, Nigeria ranks among the top ten countries with the highest primary out-of-school rates in the world (UNICEF, 2016). Recently, Nigeria overtook India as the poverty capital of the world with about 87 million Nigerians living in extreme poverty and even worse it is estimated to continue growing by about six people every minute (Brookings, 2018). The picture becomes even bleaker when the ever-increasing population growth rate of the country is taken into account. This raises a key policy concern as to whether the operations of household enterprises are contributing to the level of poverty or whether the rate of poverty in the country is driving the choice to own and operate a household enterprise.

The World Bank estimates that about 40 to 50 million additional jobs will be needed to employ Nigeria's population between 2010 and 2030, however, in order to achieve the goals of poverty

alleviation and inclusive growth, the jobs created need to be more productive (World Bank, 2015). These concerns bring to the fore the urgent need to tackle informality in Nigeria. Suffice to say that the government as well as several non-governmental organizations has attempted severally to address this issue through programs targeted at these forms of businesses and jobs such as the Lift Above Poverty Organization (LAPO), National Poverty Eradication Programme (NAPEP), TraderMoni, among others. Despite these efforts, most of which aimed at providing microcredit to micro and household enterprises, very little seem to have been achieved. Hence, it is evident that for effective policies that will encourage the productivity growth as well as transition into higher and more stable sources of livelihood of these enterprises and their owners, evidence-based analyses of their characteristics and needs is crucial.

Motivated by these concerns, this study attempts to provide empirical insights into the relationship between informality and poverty: is the rising informality responsible for the increasing rate of poverty or is the reverse the case? In addition, the study seeks to shed more light into the nature, operations and productivity of household enterprises in Nigeria, employing quantitative econometric techniques.

1.3 Research Objectives

The broad objective of this study is to analyze the nexus between informal household enterprises and poverty in Nigeria. The specific objectives include to:

- i. Characterize the nature of informal household enterprises and investigate the reasons for their persistence;
- ii. Examine the relationship between poverty and the ownership of the informal household enterprises;
- iii. Investigate the determinants of the productivity of the informal household enterprises

1.4 Research Questions-

Following from the objectives of this study, the research questions include the following:

- i. What is the nature of informal household enterprises and the reasons for their persistence in Nigeria?
- ii. What is the relationship between poverty and the ownership of informal household enterprises?
- iii. What are the determinants of the productivity of informal household enterprises?

1.5 Significance of the Study

The informal sector, particularly, household enterprises, plays an important role in Nigeria employing more than half of the working age population. However, given the low productivity of these enterprises coupled with the high incidence of poverty in the country, it is imperative to gain sufficient insights into the working of the sector as well as its relation to poverty. Although, quite a number of studies have been carried out on the informal sector and its relationship with poverty across different regions of the world and in Nigeria, this study contributes to the existing literature methodologically and empirically.

Methodological Contribution- The relationship between informality and poverty is a bi-directional one and several studies in the literature fail to account for this simultaneity except for a few (Amuedo-Dorantes, 2004; Gulyani, 2010); Canelas, 2019). This study contributes to the literature by accounting for the inherent simultaneity through the use of a simultaneous equation model which allows for endogeneity across equations. Furthermore, few existing studies on the survival/persistence of the informal sector (Nagler and Naude', 2014; Fox and Sohnesen, 2016) are based on descriptive analysis, lacking rigorous empirical analyses. This study fills this gap by using duration analysis to examine the reasons for the persistence of informal household enterprises in Nigeria.

Empirical Contribution- While several studies exist that empirically analyze the nexus between informality and poverty in Nigeria (Yusuf, Ijaiya and Ijaiya, 2009; Iyoboyi, 2013; Adeeko, 2016; Otekhile and Matthew, 2017; Nuhu and Abdullahi, 2018), the heterogeneity of the informal sector is often ignored in most them. Without disaggregating the informal sector, it is difficult to ascertain which level/aspect of informality is most related with poverty because as highlighted by ILO (2018), not all persons employed in the informal sector are poor. Hence, it is important to account for the heterogeneity inherent in the informal sector by disaggregating it. This study fills this gap by focusing on a category of the informal sector, household enterprises, characterized as the lower tier of the informal sector by Fields (2005).

In addition, most of the studies on Nigeria with regards to informality and poverty are often limited to certain regions or states (Yusuf et al., 2009; Otekhile and Matthew, 2017; Nuhu and Abdullahi, 2018), only a few conducts the analysis for the country as a whole (Iyoboyi, 2013; Adeeko, 2016). However, this study sits among the very few studies on Nigeria to utilize the Generalized Household Survey (GHS) by the World Bank, a nationally representative household survey on Nigeria to empirically examine the relationship.

1.6 Scope of the Study

This study shall be conducted for a distinct category of the informal sector; household non-farm enterprises in Nigeria. The empirical analyses will be carried out using the three existing waves of the Generalized Household Survey; 2010/2011, 2012/2013, and 2015/2016.

2. STYLIZED FACTS ON THE NATURE OF INFORMAL HOUSEHOLD ENTERPRISES AND THE REASONS FOR THEIR PERSISTENCE IN NIGERIA

2.1 Introduction

This section presents stylized facts on the nature of informal household enterprises and poverty in Nigeria. The discussion is divided into three subsections: the informal sector in Nigeria, the nature of informal household enterprises in Nigeria and the reasons for the persistence of informal household enterprises in Nigeria.

2.2 The Nigerian Informal Sector

According to the 17th International Conference of Labour Statisticians (ICLS), the informal sector is “a subset of unincorporated enterprises not constituted as separate legal entities independently of their owners, they are owned by individual household members or several members of the same or different households” (ILO, 2018). The informal sector in Nigeria comprises economic activities carried out by individuals and organizations which are outside the purview of the government regulation. It covers a wide range of activities including hairdressing, transport, petty traders, carpentry, tailoring, street vendors, garbage collectors, barbers and many more. According to the National Bureau of Statistics (NBS) (2018), the informal sector in Nigeria accounted for about 96 percent of the total employment generated in the country by Micro, Small and Medium Scale Enterprises (MSMEs) in 2017, this represents about 56 million out of the total 59 million employments generated. This indicates that the informal sector is the largest employer of labour in Nigeria.

Table 1: Employment in the Informal sector as at December, 2017

No. of Employees as at December, 2017		Sole Proprietors (owners of businesses) 2017		Other Forms of Businesses	Total
Male	Female	Male	Female		
11,849,781	3,438,512	20,668,789	19,610,623	1,190,535	56,758,240

Source: NBS, 2018

2.3 The Nature of Informal Household Enterprises in Nigeria

Informal household enterprises in Nigeria represent the largest percentage of the entire Nigerian informal sector, excluding agriculture. According to the NBS (2016) about 67 percent of Nigerian households operate at least one household enterprise. In addition, the International Monetary Fund (IMF) (2017) reports that unregistered household enterprises accounted for approximately 65 percent of Nigeria's GDP in 2017. The nature of informal household enterprises in Nigeria is discussed below:

- i. Gender Composition:* The NBS in its report on the third wave of the General Household Survey (GHS) reveals that the percentage of women engaged in household enterprises was more than that of men in both the post planting and post harvest rounds of the survey. The figures stood at 17.9 and 25.0 percent for men and women respectively in the post-planting round and 18.0 and 23.9 in the post-harvest round. This is an indication of the need for a gender focus in policies targeting the informal sector (NBS, 2016).
- ii. Distribution of household enterprises by location:* Majority of the informal household enterprises in Nigeria are located in the urban areas compared to the rural area. Figure 2 below shows that while 76.2 percent of households in the urban areas participated in informal household enterprises, 60.7 percent of those in the rural areas did participate. This occurrence can be linked to the fact that majority of the rural dwellers engage more in agriculture as their primary source of livelihood while non-farm enterprises are mainly owned to augment the household income.
- iii. Enterprise Activities:* The major activity of household enterprises in Nigeria is retail trade comprising buying and selling, petty trading, hairdressing, barbing saloons and so on.
- iv. Source of start-up capital:* Most household enterprises begin operation with funds from personal savings as well as contributions from family and friends. This trend is in most

cases due to the fact that owners of these enterprises are unable to obtain credit from formal banking institutions due to the small nature of their businesses and even worse, is that most of the owners are illiterate and unbanked, with no bank accounts (Kanbur, 2017).

- v. *Place of operation and Distribution of customers:* In Nigeria, a significant proportion of informal household enterprises are operated from the home, indicating that they are mostly small scale in nature. Estimates based on GHS 2015/2016 reveal that the most prominent places of operation of these enterprises include: Home inside residence (23.3%), house outside residence (19.2%), traditional market (17.5%), commercial area shop (14.4%), mobile/no fixed location as well as roadside (13.3% and 6.1%, respectively) (NBS, 2016).
- vi. *Value of capital stock:* Household enterprises in Nigeria are characterized by low level of capital stock. On the average, the value of capital stock of informal household enterprises in Nigeria is ₦113, 000 (approximately \$295 US, based on the official exchange rate of ₦382/\$1 as at April, 2020) while more than 50 percent of the enterprises have less than ₦ 15, 000 (approximately \$39 US, based on the official exchange rate of ₦382/\$1 as at April, 2020) as the value of their capital (NBS, n.d). This depicts the fact that most household enterprises are set up as survivalist ventures, often meant to meet up with daily needs of the household. This limits the growth potential of such enterprises and the improvement of the standard of living of the households involved.

3. LITERATURE REVIEW

3.1 Introduction

This chapter presents a comprehensive review of the literature on informality and poverty. It comprises a review of both the theoretical and empirical literature.

3.2 Theoretical Literature review

Over the years, the debate on the nature and composition of the informal sector has remained, resulting in several schools of thought which offer several causal theories for informality. In this regard, there exist four dominant schools of thought in the literature; the Dualists, the Structuralist, the Legalist and the Voluntarist Schools of thought.

The Dualist school credited mainly to the works of ILO (1972), Hart (1973), Sethuraman (1976) and Tokman (1978); view the informal sector as being made up of “marginal activities” which serve as a means of livelihood to the poor and a safety net in times of shocks (Chen, 2012). The dualist theory is based on the rural/urban, agriculture/industry, and non-capitalist/capitalist dichotomy, and delineates the simultaneous but unrelated existence of the formal and the informal sectors.

The structuralist school of thought on the informal economy was introduced by Manuel Castells and Alejandro Portes in 1989. Their main focus here is the petty traders and producers, sub-contracted workers, and casual workers. Also, they view the informal economy as informal enterprises and workers whose functions are to reduce input and labour costs of large capitalist firms and increase their competitiveness. Aside from its systematic linkage to the capitalist firms, informality is further seen as a universal, heterogeneous, and a sector quickly on the rise most especially in the developing countries. This approach argues that economic informality is a product of capitalism; therefore the two sectors do not exist independently. Their belief is that informality will exist only as long as large capital exists because informal enterprises are dependent on large capital from the capitalist workers.

The origination of the legalist (or neo-liberal) perspective dates back to the work of Hernando De Soto (1989). Unlike the dualist perspective, the legalists strongly believed in the state's intervention, particularly in terms of state regulations that support the creation and maintenance of economic activity. A notable work in this regard among others is the work of Centeno and Portes (2006:30) on "the relationship of the informal economy and the state is by definition, one of inevitable conflict". More so, in an argument put forward by De Soto himself, informal economies were neither a function of poverty nor a structural necessity of late capitalism. Instead, he suggested that informality is a choice made by rational actors facing a legal environment that hinders creative entrepreneurship.

The Voluntarists argue that the informal sector is made of economic units who voluntarily choose to be informal not because of the registration process but to avoid regulations and taxations of the formal system (Chen, 2012). Chen further stated that the voluntarists focused on the producers and traders who are willing to take opportunity of the information available in the economy. They choose to operate informally after weighing the costs and benefits of informality against formality. The causal root of informal economy stems from the efforts of the economic participants to avoid taxation and costly regulation in the formal economy.

3.3 Empirical Literature Review

3.3.1 Linkage between Informality and Poverty – other countries

There are two distinguished conclusions in the literature on the nexus between informality and poverty. The first is that informality reduces poverty in the economy and the second is that informality is one of the major causes of poverty. The study by Canelas (2019) in particular used the Ecuadorian Family Expenditure survey to study the determinants of poverty and informality taking into consideration the two way process. Findings from the results showed that poverty increases the likelihood of informal work among low-skilled workers by around

10% and were insignificant on informal work of the high-skilled workers. Nazier and Ramadan (2014) investigated the causality dilemma between informality and poverty in Egypt by using the Egyptian labour Market Panel Survey (ELMPS) for 2012. They found out a rather compelling result indicating that informality in the private sector significantly increases the likelihood of falling into poverty. In Argentina, Devicienti et al. (2009) found positive spillover effects from past poverty to current informal employment and from past informality to current poverty status by using the dynamic random-effect bivariate probit model. In order to examine the potency of informal economy in alleviating poverty in Vietnam, Thi Minh Hieu et al. (2013) used both probit and quantile analysis to conclude that informal earnings is a factor reducing poverty in poor households but negatively affects the economic activities of the rich households. Among other things, Loayza et al. (2009) studied the connection between poverty and informality in Latin America and the Caribbean by using country-level data and they inferred from the results that the share of the informal sector had a positive significant impact on the incidence of poverty in the region.

3.3.2 Informality and Poverty in Nigeria

Iyoboyi (2013) confirmed the existence of poverty in the informal sector in his study on 'Poverty alleviation in the informal sector as a catalyst for Nigeria's economic growth'. With critical and trend analysis method from 2000 to 2010 periods, he stressed the importance of the informal sector as the foundation of the economy. Further, he concluded that strengthening the informal sector is key to reducing the high poverty level in the country. . Otekhile and Matthew (2017) explored the contribution of the informal sector to economic activities in Lagos, Nigeria. The descriptive analysis results from the 2000 street traders in Ikeja and Oshodi area of Lagos state showed that street trading is significant in providing employment and generating a source of livelihood in the area under study. Nuhu and Abdullahi (2018) analyzed the impact of informal sector on employment generation and poverty reduction in Chikun Local Government

Area of Kaduna state, Nigeria in 2017. The results revealed that the informal sector has a positive significant impact on poverty reduction in the state, most especially through job creation and improved earnings of the operators.

Phillip et al. (2013) combined both primary and secondary data by distributing 369 questionnaires. The Chi-square results indicated that the informal sector significantly reduced unemployment and poverty in the region. They concluded that with proper mechanisms in place, the unemployment level and poverty would further reduce in the face of informal sectors activities in the region. Also, Ogunriola (2011) employed both descriptive analysis and OLS technique to investigate the role of informal self-employment on poverty with evidence from 777 randomly selected Motorcycle Taxi riders in two states in Nigeria (Lagos and Ogun State) in September and October 2008. The study concluded that over 86 percent of the participants earn above the minimum wage and as a result reduces poverty in the country.

4. THEORETICAL FRAMEWORK AND METHODOLOGY

4.1 Introduction

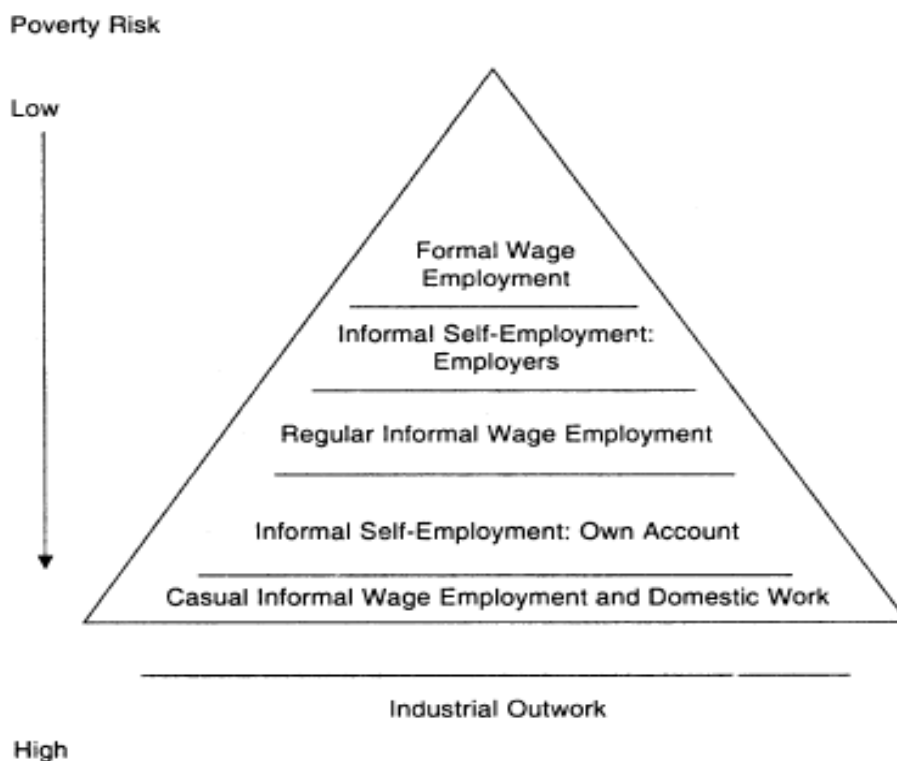
In this section we discuss the theoretical framework utilized for this study in 4.2 while the model specification is presented in 4.3.

4.2 Theoretical Framework

Drawing insights from the theories reviewed above, the underlying theory for this study is the dualistic theory. Based on the nature of informal household enterprises discussed in the preceding section, it can be concluded that informal household enterprises in Nigeria are operated mostly on small scale basis and for survival purposes, as they serve as means of livelihood for the poor. In addition, the rapid rate of population growth as well as the rural-urban drift which contribute significantly to the persistence of these enterprises in Nigeria fits into the causal theory as well as the characteristics of the informal sector as presented in the dualistic theory.

Furthermore, the theoretical framework of this study is based on the WIEGO model of informal employment developed by Chen et al. (2005). This model provides a framework for the interrelationship between informal employment and poverty (“poverty risk” as coined by WIEGO). The appropriateness of this model also lies in its segmentation of different statuses of informal employment which clearly identifies informal household enterprises (informal self-employment – own account) as one and establishes a relationship with poverty. In particular, the relationship is depicted in figure 1 below:

Figure 1: Poverty Risk of households by primary source of income



Source: Chen et al. (2005)

Figure 1 above shows that for household enterprises, the poverty risk is quite high compared to other categories of informal employment. Specifically, it depicts that for households whose primary source of income is based household enterprises, their risk of falling into poverty is high (Chen et al., 2005). This establishes a basis for arguing that engaging in informal household enterprises increases the household's likelihood of being poor, hence, ownership of household enterprises is a determinant of poverty.

However, following from previous studies (Amuedo-Dorantes, 2004; Devicienti et al., 2009; Canelas, 2019) which establish a bi-directional relationship between informality and poverty, this study tends to extend this model by incorporating a reverse relationship between poverty and informality. In other words, this study argues that although ownership of an informal household enterprise increases the likelihood of a household being poor, the poverty status of a household can affect its likelihood of owning an informal household enterprise.

4.3 Model Specification

4.3.1 Empirical Model for Examining the Nature and Reasons for the Persistence of Informal Household Enterprises in Nigeria

To examine the nature of informal household enterprises in Nigeria, descriptive statistics would be utilized. However, to analyze the reasons for the persistence of informal household enterprises in Nigeria, we first use descriptive statistics to examine the average duration of household enterprises. In addition, we estimate a semi-parametric duration model, using the Cox PH model, to examine whether certain individual and household affect the duration of the household enterprises. According to Cameron and Trivedi (2005), fully parametric models in the presence of any misspecification of the parametric model yields inconsistent parameter estimates. The Cox PH model, a semi-parametric model, however, helps to overcome this challenge of misspecification as it requires less than complete distributional specification (Ibid). For the model, the conditional hazard rate $\lambda(t|x)$ of the proportional hazard model is factored into separate functions of

$$\lambda(t|x) = \lambda_0(t)\phi(x, \beta) \tag{4.1}$$

where $\lambda_0(t)$ is called the baseline hazard and is a function of t alone. The function $\phi(x, \beta)$ is a function of x alone which includes time-invariant regressors.

$\phi(x, \beta)$ is specified as an exponential form given as:

$$\phi(x, \beta) = \exp(x'\beta) \tag{4.2}$$

This allows coefficients to be easily interpretable in addition to ensuring $\phi(x, \beta) > 0$.

The regressors for the duration model include: gender of the household head, and highest educational attainment of the household head. The choice of variables arises from the need for time-invariant variables to estimate the duration model.

4.3.2 Empirical Model for Examining the Relationship between Poverty and Ownership of Household Enterprises

From the theoretical framework discussed above, a possible bi-directional relationship is identified between poverty and the ownership of household enterprises implying that both variables are interrelated.

Hence, to examine the causal relationship between poverty and the ownership of household enterprises, a simultaneous equation model is specified below:

$$y_{1i} = \alpha_i + \beta_i y_{2i} + \gamma_i X_{1i} + \delta_i H_{1i} + \Phi_i F_{1i} + \varepsilon_{1i} \quad 4.3$$

$$y_{2i} = \alpha_i + \beta_i y_{1i} + \gamma_i X_{2i} + \delta_i H_{2i} + \Phi_i F_{2i} + \varepsilon_{2i} \quad 4.4$$

Where y_{1i} is a dummy variable indicating the i th household's poverty status, y_{2i} is a dummy variable indicating whether household i owns a microenterprise, X_{ji} is a vector of sociodemographic characteristics of the i th household head such as the age of the household head, gender of the household head, marital status and highest educational qualification of the household head; H_{ji} is a vector of household characteristics such as household size, number of children in the household, whether the household is a remittance receiver, share of other household members who are working, annual net household income and whether their current home is rented; F_{ji} is a vector of location-specific characteristics such as whether the household is located in an urban area and geographical region while ε_{ji} represents the random error term, with $j = 1, 2$. The variables used for estimation are standard in literature and based on previous studies.

Although, equations 4.3 and 4.4 have some common sets of exogenous variables, for the purpose of estimation identification, each of the equations contain a number of unique exogenous variables. Equation 4.3 is identified by the exclusion of renting of current home. While this variable is expected to affect the likelihood of owning a microenterprise, it is not by itself a determinant of household poverty other than through the ownership of a microenterprise

by the household. Also, equation 4.4 is identified by the exclusion of number of other household members who are working. This is because, while this variable is highly correlated with household poverty, it does not affect by itself the decision to own a household enterprise other than through household poverty (Amuedo-Dorantes, 2004; Canelas, 2019).

4.3.2.1 Estimation Technique and Estimation Issues

The relationship between poverty and the ownership of household enterprises is ridden with the problem of endogeneity, in the sense that a household's poverty status can influence its probability of owning a household enterprise while owning an enterprise can be a determinant of the poverty status of a household (Amuedo-Dorantes, 2004; Gulyani, 2010). Estimating the equations without allowing for such endogeneity will result in inconsistent and biased estimates. Hence, in order to control for the endogeneity between household poverty and the ownership of household enterprises, this study utilizes the maximum likelihood bivariate probit model to estimate the systems of two equations represented in equations 3.17 and 3.18. As noted by Nichols (2011), the bivariate probit method is best suited for binary outcome and endogenous variables. In addition, the two-stage least squares (2SLS) approach will also be utilized for robustness.

4.3.3 Empirical Model for Examining the Determinants of the Productivity of Household Enterprises

In estimating the labour productivity of household enterprises, there exists the possibility of sample selection effects which result in biased estimates if not corrected (Nagler and Naudé, 2014). Hence, to account for such effects, the two-step Heckman Selection model is adopted to achieve objective two of this study. The model comprises a selection equation as well as an underlying regression/outcome equation. Formally, the regression equation is specified as:

$$y_i^* = X_i\beta + \mu_{1i} \quad 4.5$$

Where y_i is the log of labour productivity, X_i is a vector of individual, household and enterprise characteristics. These include age, gender as well as highest educational attainment of the enterprise owner, number of adults in the household, household's access to credit, whether the household is located in the urban area, size of the enterprise and whether the household experienced any shock.

However, the dependent variable is not always observed but depends on a latent variable h_i in the selection equation so that:

$$y_i = y_i^* \text{ if } h_i = 1 \text{ and } y_i \text{ not observed if } h_i = 0.$$

The selection equation is specified as:

$$h_i^* = z_i\gamma + \mu_{2i} \tag{4.6}$$

Where h_i^* is a latent variable corresponding to the “outcome” productivity level, which is only observed once a household operates a household enterprise, hence $h_i = 1$ if $h_i^* > 0$ and $h_i = 0$ if $h_i^* \leq 0$. h_i is a vector containing the determinants of enterprise operation which includes individual, household and location characteristics. In the selection equation, the individual characteristics correspond to that of the household head as both households with and without an enterprise are included.

4.3.4 Definition and Measurement of Variables

The key variables used for this study are described below:

Poverty is represented by a dummy which takes on the value of 1 if the household is poor and 0 if the household is non-poor. Households are disaggregated into poor and non-poor using an expenditure-based poverty line. According to the National Bureau of Statistics (n.d.), the 2009-10 poverty line is defined at ₦55, 235.20 per person per year (i.e. per capita expenditure). This

was adjusted for inflation using the 2003-04 poverty line (₦28, 836.70 per person per year) as the reference. Hence, households with expenditure below the poverty line are classified as poor while those with expenditure above it are non-poor.

Informality in this case is represented informal enterprises specifically household enterprises. In particular, the study focuses on the ownership of household enterprises, hence the variable represented by a dummy with value 1 if the household owns an enterprise and 0 if it doesn't.

Owing from previous studies in the literature (Nagler and Naudé, 2014; World Bank, 2016), this study measures productivity using labour productivity which is calculated as

$$\frac{\textit{Average monthly sales}}{\textit{Number of workers}} \quad 4.7$$

This measure of productivity is utilized due to the unavailability of data necessary to estimate production functions for measuring Total Factor Productivity (TFP).

Other explanatory variables include individual characteristics such as age, gender, highest educational attainment of the household head as well as those of the enterprise owner (for the Heckman model); Household characteristics such as household size, number of children in the household, number of adults in the household, household's access to credit, household's exposure to any shocks; Location as well as enterprise characteristics such as whether the household is located in the urban area, enterprise size and access to credit.

4.3.5 Types and Sources of data

The data for this study comprises of the three waves of the Nigeria General Household Survey (GHS) panel covering the years 2010-2011 (wave 1), 2012-2013 (wave 2) and 2015-2016 (wave 3). The General Household Survey (GHS) for Nigeria is in collaboration with the World

Bank's Living Standard Measurement Study- Integrated Surveys in Agriculture (LSMS-ISA). The data is a nationally representative survey of 5,000 households visited. However, due to attrition and non response, the number of households for each varies as follows: wave 1 – 4,916 households, wave 2 – 4,716 households and wave 3 – 4,581 households. With respect to the household enterprises surveyed, the figures were quite higher as it is observed that some households had more than one household enterprise, in particular, for wave 1, 4,594, wave 2, 5,931 and wave 3, 6,247 household enterprises were surveyed. Each wave of the survey consists of community, agricultural and household level information ranging from demographics such as age, gender, marital status as well as the educational qualification of the members of the household, household size, among others; food and non-food expenditure, household assets, farming practices as well as non-farm enterprise and income generating activities among others. On the income generating activities, responses to questions such as the whether the enterprise is currently operational or closed, when it closed, whether the enterprise is officially registered, number of employees who are not household members, the main source of capital for the enterprise, whether the enterprise had access to credit, among others, are provided which are vital for this study.

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