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Economic Exclusion and Working Poverty: The Case of the Informal Sector Workers in the MiDA Intervention Zone in Ghana

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Abstract
There is a growing concern over working poverty, especially in nations where inequality remains very high. While scholars in the advanced economies attribute working poverty mainly to economic exclusion, there appears to be limited literature on the issue, particularly for the informal sector of the developing economies. However, surveys (various issues of GLSS) on the Ghanaian economy have identified some informal sector worker as poor. Using the data of Ghana Living Standard Survey Five Plus (GLSS 5+), both OLS and probit models were employed in estimating the incidence of working poverty in the MiDA intervention area of Ghana. Factors such as high dependency ratio, labour inefficiency and underemployment by classification of hours worked came out strongly as supporting 'working poverty'. The results seem to confirm the outcome of several studies in the developed economies that have identified factors of economic exclusion such as labour inefficiency and underemployment as the main causes of 'working poverty'. This means that poverty among informal sector workers in Ghana should not be solely attributed to joblessness. A comprehensive poverty reduction strategy is therefore needed to tone down underemployment while improving labour efficiency of the informal sector workers to ensure higher labour returns.

Introduction

The link between social exclusion and deprivation is well articulated by the literature. Despite the difficulty in achieving a precise definition for social exclusion in the last four decades when the concept caught the attention of research, it is clear from the series of attempts to define it that its main concern is with multiple deprivations (**John and Kitty, 2005**). In other words, the socially excluded are mostly deprived individuals who are often kept away from enjoying certain good things of life.

As an analytical theory, social exclusion generally seeks to describe an exclusion of individual from fully taking part in all or some economic activities. In line with this assumption, Burchardt (2000) defined socially excluded as an individual who does not participate to a reasonable degree over time in certain activities of his or her society due to factors beyond his or her control. His definition is not different from Thorat (2007) who

defined social exclusion as "the process through which individuals or groups are wholly or partially excluded from full participation in the society within which they live." (p. 1). While the unemployed who suffer *complete exclusion* might not earn any income at all, the underemployed who suffer *partial exclusion* does not earn enough income to stay out of poverty. In other words, social exclusion often leads to income poverty because the excluded do not earn enough income.

While lack of income could exclude an individual from enjoying certain comforts of life, social exclusion is more than a mere lack of income or just being poor. The theory focuses on both the processes by which social and economic institutions exclude groups, and the multidimensional nature of the adverse consequences experienced by those who are excluded (Thorat, 2007). Apart from social exclusion addressing the circumstances of the excluded, it appears as a multidimensional in its concern for multiplicity of deprivations in all aspects of human life.

Economic exclusion as a reason for poverty

Economic exclusion is one of the dimensions of social exclusion that Bradshaw's (2003) discussed. It seeks to explain how an individual could either be partially or fully excluded from the production process. While those who suffer complete economic exclusion are often referred to as unemployed in the labour market, the partially excluded are the underemployed. One of the aims of this study is to try and understand how partially exclusion from economic production process can explain the poverty status of the affected persons.

Economic exclusion can affect a whole group. Thorat (2007) wrote: "Group-based economic exclusion or discrimination affects whole groups in a society, independent of the income, productivity, or merit of individuals within the group" (p.2). In other words, for the group-based exclusion, the yardstick for exclusion is the group's identity and not the economic or productive characteristics of a specific individual (ibid). In same manner, economic exclusion is described an *'individual-based exclusion'* which is rather as a result of an individual not meeting the standard productive characteristics of production process as prescribed by the labour market. People who work and are poor could suffer from both the group-based exclusion and individual-based exclusion. For example, two persons of the same academic pedigree or skills with one working in Ghana and the other in US might earn different incomes due to the group-based exclusion. However, differences in income between these two persons who are all working in Ghana might be mainly due to individual-based exclusion. This means that differences in the levels of poverty among the self-employed in the informal sector of the Ghanaian economy might be due to the differences in the standard productive characteristics demanded by the labour market in Ghana.

Economic exclusion usually results from inability to access markets because of lack of income, or from employment on the grounds of low productivity, or from admission to educational institutions on the basis of low merit. According to Figueroa (1999), *Exclusion from the economic process* means exclusion from market exchange. He explained:
Conventional economic theory assumes that all markets are "Walrasian," in the sense that individuals can buy or sell a good or a service as much as they want at the prevailing market price. In such markets, rationing operates through prices, and the amount to be exchanges is just a matter of money. In these markets no one willing and capable of buying or selling could be excluded from exchange. People may be excluded from exchange in some particular markets, but this is because their real income, or productive capacity, is too low (p.3).

Relating poverty to economic exclusion, Thorat (2007) wrote, "It is quite clear that insofar as exclusion and discrimination involve the denial of access to resources, employment, education, and public services, they certainly impoverish the lives of excluded individuals" (p. 2). In other words, the excluded do not have the voucher to access the good things of life they need. They are even further excluded from the commodity market because of the increasing prices resulting from low production. That is to say, because the potential of the excluded is not fully harnessed, general output of the economy is adversely affected leading to higher prices in the consumer goods and services which tend to exacerbate their already precarious circumstances.

Thorat (2007) used economic theory to indicate that discrimination can also hamper economic growth by reducing efficiency. This he explained: "Discrimination also results in inefficiency by reducing the magnitude of investments in human capital by groups discriminated against and by reducing the return to any human capital investments they make" (p. 2). Therefore, some workers are less efficient either due to the failure of the group to make the necessary investment in them (group-based exclusion) or because they fail to develop their human capacity themselves (individual-based exclusion).

It is therefore deduced from the above discussions that economic exclusion can lead to social deprivation, especially consumption poverty through its impact on both partial exclusion from economic activities (underemployment) and low skills acquisition (labour inefficiency) resulting from denial of an individual to receive adequate training/education.

Conceptual framework

In Figure 1, the assumption is that once the economy expands and labour is trained enough for better integration, underemployment will decline. That is the unemployed will have chance to work while those working for few number of hours will have opportunity to work for more hours. Therefore, improvement in the employment potential, as represented by an upward shift of the marginal value product curve of labour, serves as potential remedy in dealing with underemployment and low labour returns in a country (Osmani, 2003). However, improvement of employment potential largely depends on the expansion of the economy's production possibilities and as well as the capabilities of the poor to integrate into the expanding sectors.

In other words, if the economy expands and some individuals are excluded from being actively involved in production process, their situation would not get any better. For example, *individual-based* exclusion factors such as education and training may exclude labour from being integrated even after the economy has grown remarkably. This might be the reason why economic growth as a central focus to poverty reduction has not been too effective in Ghana. Hence, the study investigates empirically how both *individual-based* and *group-based* economic exclusion factors such as: underemployment, labour inefficiency, age, education, household size, prices of factors of production, use of electricity and area of residence could combine to render an informal sector worker in Ghana poor.

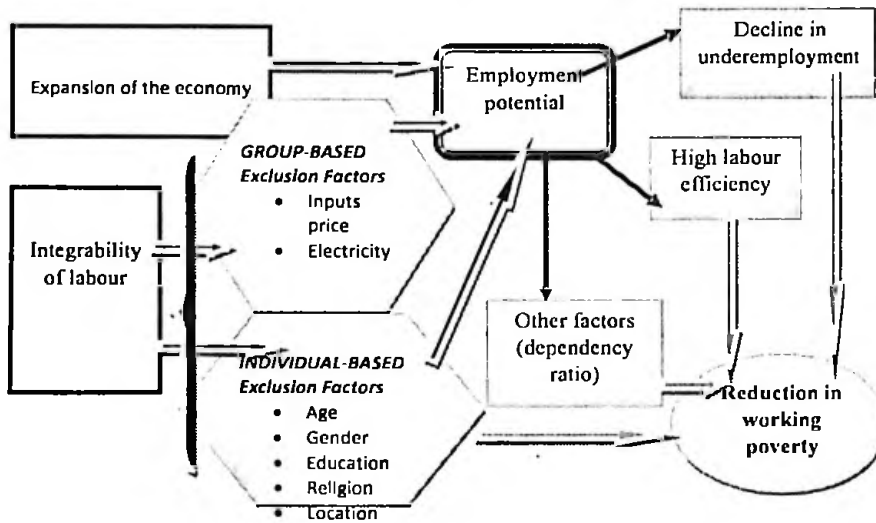


Figure 1: Framework of channels to working poverty
Source: Authors' construct

Methodology

The data

The study uses both qualitative and quantitative data. While the quantitative data is employed for the econometric analysis, focus group discussions (FGDs) are held to clarify some of the econometric findings. The main quantitative data is the GLSS 5+.

The Government of Ghana, through the Millennium Development Authority, implemented a 5-year $547 million Compact signed with the Millennium Challenge Corporation (MCC) of the United States of America from 2007 to 2012. The principal goal of the compact was to reduce poverty through economic growth and agricultural transformation. While about 230,000 individuals were expected to benefit directly from the compact interventions, an estimated additional 1,000,000 were also expected to benefit indirectly. In an attempt to quantify the benefits in order to determine the success of the intervention, the Institute of Statistical, Social and Economic Research (ISSER) was tasked to carry out two key surveys: two rounds of Ghana Living Standards Survey Round Five Plus (GLSS5+) and three rounds of Farmer Based Organization (FBO) Surveys. ISSER worked in collaboration with the Ghana Statistical Service (GSS) to conduct the first round of GLSS5+ in 2008 in the MiDA intervention districts. ISSER had the overall leadership of the data collection effort including the design, supervision, analyses and overall quality control of the data, with GSS contributing its substantial survey infrastructure (enumerators, vehicles, field presence).

Specifically, 9,310 households in 620 Enumeration Areas (EAs) in the 23 programme districts were surveyed using community and household questionnaires between April 2008 and September 2008 for the baseline GLSS 5+. The study therefore employs data from the baseline survey of the GLSS 5+ for all its econometric analyses. The 23 programme districts are located in three (3) zones. These zones are: the Northern Agriculture Zone encompassing five districts in the Northern Region, the Afram Basin covering six districts in the Ashanti and Eastern Regions, and the Southern Horticultural Belt including twelve districts in the South-East Coastal Plains (Greater Accra, Eastern and the Volta Regions) of Ghana. These districts are by no means the poorest districts in Ghana.

Quantitative Analysis

As already discussed, Ghana Living Standard Survey Five Plus (GLSS 5+) is the only data set used for the econometric analysis of the study. Considering the main intention of the study as investigating the determinants of working poverty, the initial analytical problem was how to

identify the working poor. Even though there are many ways of identifying the poor, the design of the data and the focus of the study make *consumption expenditure* as the most convenient approach for separating the poor from the rich.

Poverty Measurement and Analysis

One of the difficult issues with welfare analysis is to devise a common measure of poverty. Following a pattern prescribed by Coudouel, Jesko and Quentin (2002), the study adopts consumption as an indicator of well-being. This became appropriate because of the informal nature of the study area (Atkinson, Rainwater & Smeedin, 1995). For instance, while income measure of welfare is usually acceptable in some communities, the volatile nature of workers' income in the developing economies makes it difficult to rely on income as a measure of welfare.

Having settled on consumption expenditure as a more convenient measure of welfare, the next stage was the choice of appropriate model for determinants of poverty. Two models, *expenditure function approach* (linear regression) and *discrete approach* appear appropriate (*Fissuh & Harris, 2005, World Bank, 2005)*. In the expenditure function approach, a continuous variable, consumption expenditure per adult equivalent is regressed on a set of explanatory variables (Geda *et al.*, 2001; Arneberg and Pederson, 2001) while in the discrete approach, a poverty line is employed to divide the population into poor and non-poor after which a probit model is used to estimate the probability of a household being poor conditional upon some chosen explanatory variables.

According to *Fissuh and Harris (2005), t*he discrete choice model has a number of attractive features that make it appears superior to the expenditure approach. For instance, because the discrete choice model is able to give probabilistic estimates, it can make probability statements about the effect of the variables in the poverty status of any economic agent. Again, apart from the discrete choice model allowing for the effects of independent variables to vary across poverty categories, it also tries to capture any heterogeneity between the poor and non-poor.

However, certain other attributes of discrete model render consumption function approach preferable. In the first place, there could be loss of information by creating categories of poverty status as required in the case of discrete modelling (ibid). As a result, Brucks (2007) described discrete approach (probit) as a more *narrow sense* of poverty measure. In the same vein, because the continuous consumption function is able to capture information at all levels of poverty, it was described as a more *broad sense* measure of poverty. Again, while those above or below the poverty line are

heterogeneous, discrete approach of modelling does consider them as homogenous (Jollife & Datt, 1999). Lastly, *(Fissuh & Harris, 2002)* identified some arbitrariness in the setting of the absolute poverty line. It is therefore clear that each of the two approaches has its own merits and demerits. Therefore to ensure robustness of the results on determinants of working poverty, the study employed the two approaches of modelling determinants of poverty.

Consumption Expenditure Function Approach of Modelling Working Poverty (OLS)

The study followed closely the various suggested ways by Ghana Statistical Service in computing consumption expenditure for the Fifth Round of the Ghana Living Standard Survey (GLSS 5). Among the various items included in the household consumption expenditure for the study were household consumption of home produced goods and services, recorded cash expenditures on items such as food, services and housing and the non-cash incomes in kind which was included as an imputed expenditure.

By carefully including household consumption of home produced goods and services, the problem of underestimation often associated with consumption expenditure measures for subsistence agricultural households and domestic consumption of the output of non-farm production activities was minimised. While it is often difficult to include imputed cost of some household consumption in the consumption expenditure, GLSS survey results offered some scope for imputing values of such expenditures (Coulombe & McKay, 2008). Since MiDA Baseline Survey data (GLSS 5+) was modelled around GLSS 5, the same scope was therefore provided for inclusion of the imputed values of expenditure.

This makes the measured *consumption expenditure* for the study relatively more accurate than those done in many other developing economies. Describing the much improved nature of the approaches in capturing household consumption in Ghana, Coulombe and McKay (2008) wrote:
...the need to make these imputations is generally accepted in principle, although in many cases it is difficult to obtain estimates in practice and they are frequently excluded from many countries' national accounts estimates (p.5).

We followed Coulombe and McKay (2008) closely in measuring the household consumption expenditure per adult worker:

$$\omega_i = f(F_{EXP} + H_{EXP} + OA_{EXP} + FI_{EXP} + OI_{EXP} + R_{EXP}) \quad (1)$$

Where:
F_{EXP} = *Food expenditure (actual),*

H_{EXP} = *Housing expenditure (actual and imputed):* The following items are considered in capturing this component: actual expenditure on rent, an imputed rental value for owner-occupied dwellings, an imputation of rent for those households who receive subsidised or rent-free housing from employers, relatives or others, and an imputation of rent for those who neither own nor rent their dwellings (such as squatters).

OA_{EXP} = *Other expenditure (actual):* This is an aggregate of all consumption expenditure made in monetary form other than those on food and housing. It includes: elements as clothing and footwear, household management, personal care products, energy and fuels, health and education, other services, and infrequent expenditures (example; jewellery).

FI_{EXP} = *Food expenditure (imputed):* This variable captures two types of imputation; the domestic consumption of own output by households engaged in agricultural production and the value of any wage income received by household members in the form of food.

OI_{EXP} = *Other expenditure (imputed:* This variable captures domestic consumption of the output of household non-farm enterprises including wage payment in kind received in any form other than food or housing.

R_{EXP} = *Expenditure on remittances: This is made up of all* transfer payments of remittances made to other households.

Since most of these expenditure variables captured by the survey were related to a range of different reference periods, they were expressed on a consistent annual basis before being adding added up together. A reduced-form linear model of consumption function suggested by Brucks (2007) was then adapted to specify a model to analyze the determinants of working poverty of informal sector workers in the MiDA intervention study area as.

$$\omega_i = a + \beta L_i + \gamma A_i + e_i \quad \ldots\ldots(2)$$

Where: ω_i = consumption expenditure per worker (calculated as the average household consumption expenditure), L_i is a set of individual-based economic exclusion characteristics of an ith worker, A_i, a set of group-based factors of economic exclusion that affects an ith worker and e_i is an error term that is assumed to be uncorrelated with the explanatory variables.

Discrete approach of modelling working poverty

Discrete approach in modelling determinants of working poverty requires that the population is initially divided into poor and non-poor using a poverty line developed for such purpose. For comparison purposes, we followed the standards of Ghana Statistical Service in setting a consumption-based poverty line. The specification illustrated by Equation 2 is then extended for the analysis of household welfare relative to some pre-determined poverty line as follows:

$S_i = 1$ if $Y_i > Z$.....(3)

$S_i = 0$ otherwise

Where 'S_i' is a categorical poverty indicator for household i = 1...9,310 and 'Z' is a poverty line. With the dependent variable, P, being a nominal with two categories, a probit model was specified as:

$P = \alpha 1 + \alpha 2 \sum Xi + \alpha_k \sum D_k + U_i$.....4)

Where P is a dichotomous variable, poor = 1, otherwise = 0; Xi is vector of independent variables while set of control variables is denoted by $\sum D_k$ *These variables include:*

Descriptive Analysis

This section uses GLSS 5+ data to describe the incidence of working poverty and its determinant variables. One fundamental challenge of the study was how to classify individual workers as working poor. Considering the construction of GLSS 5+ data, both asset index and consumption expenditure approaches of measuring poverty appear superior to other poverty measures such as income approach. However, upon assessing the relative suitability of the two approaches, the study settled on consumption expenditure. Therefore, 'working poverty', hereafter described by the study simply means 'consumption poverty'.

Usually, poverty classification based on consumption is specifically concerned with those whose standard of living falls below an adequate minimum defined by a poverty line (GSS, 2000). In other words, a predetermined poverty line based on annual consumption expenditure is used to classify an individual as either poor or non-poor. Even though this poverty line is constructed at the household level, the study employs an econometric technique of clustering to disaggregate household poverty to individual household members. As a result, all adults of a particular household were assigned with the same poverty status. Therefore, a farmer or an operator of a household nonfarm enterprise is classified as a working poor if his/her annual consumption expenditure falls below poverty line of GH₵ *478.55*[1]. *This is also considered as equivalent to an adult nutritional requirement per annum.*

[1]The upper poverty line GH₵ 478.55 considered by study was constructed using GLSS 5+ data and it is based on 2008 constant prices. The lower poverty line is also estimated as GH₵372.00.

Having resolved the issue of poverty classification, the discussion is then done separately for the farmers and operators of household nonfarm enterprises on each variable. For simplicity and brevity, Northern Agricultural Zone is represented as NAZ, Afram Basin as AfB and Southern Horticultural Zone as SHZ in all the figures and some of the tables.

Incidence of Working Poverty

Figures 2a and Figure 2b illustrate the incidence of working poverty among workers of the informal sector of the MiDA intervention zones. Generally, proportion of the working poor appears lesser than proportion of the working non-poor. The data suggests incidence of working poverty for both farmers and household nonfarm operators as far lower in the Southern Horticultural Zone compared to the other zones. While incidence of working poverty among nonfarm operators (Figure 2a) appears slightly higher in the Afram Basin (42.4 %) than it is in the Northern Agricultural Zone (41.2 %), more farmers are poor (Figure 2b) in the Northern Agricultural Zone (40.9 %) compared to those in the Afram Basin (33.7 %) and the Southern Horticultural Zone (24.0 %).

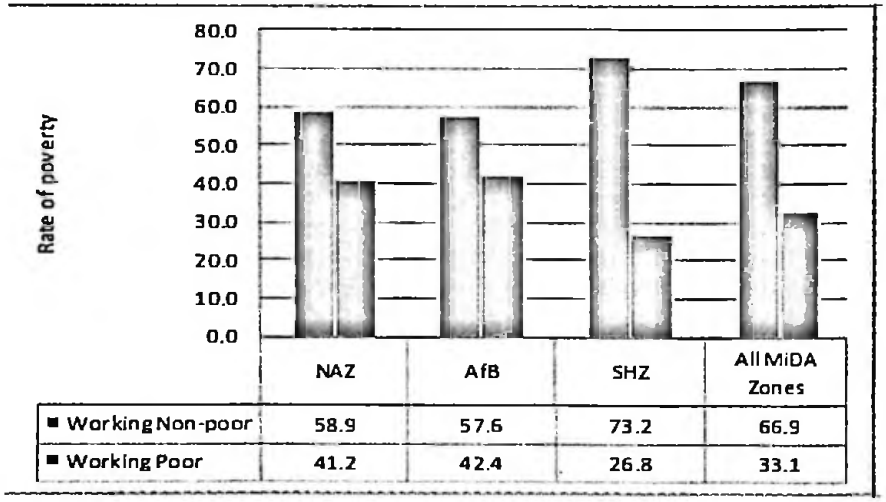


Figure 2a: Incidence of Working Poverty among Nonfarm operators, by MiDA Zone (Percent)

Source: Authors' calculation based on GLSS 5+ data

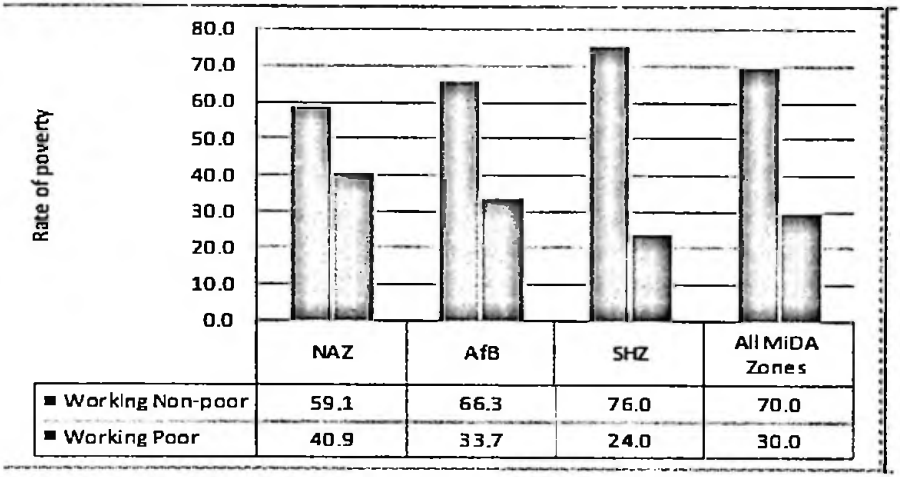


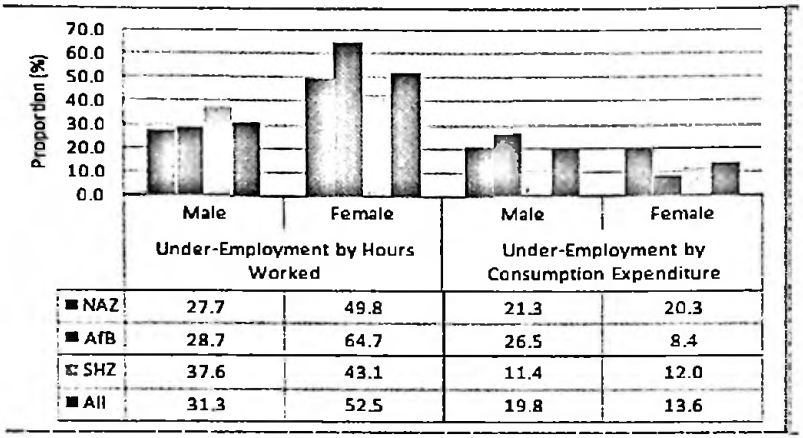
Figure 2b: Incidence of Working Poverty among Farmers, by MiDA Zones (Percent)

Source: Authors' calculation based on GLSS 5+ data

Underemployment and working poverty

Figure 3a explains the proportion of males and females who are underemployed by the classification of number of hours worked and consumption expenditure. Higher proportion of female operators of household nonfarm enterprise is classified as working poor by the number of hours worked compared to their male counterparts. For example, the data reports more than halve (52.5 percent) of the poor female operators as working below 40 hours a week with about a third (31.3 percent) of the poor male operators also working below 40 hours a week. While under-employment by hours worked appears as severest (64.7 percent) among the female operators in the Afram Basin, the highest (37.6 percent) among the males is recorded in the Southern Horticultural Zone.

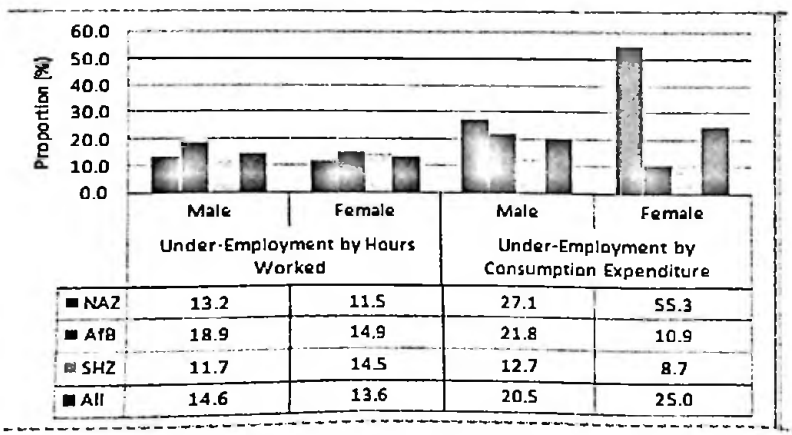
On the other hand, the incidence of underemployment by consumption expenditure classification appears higher among the males (19.5 percent) compared to that of the females (13.6 percent). While the highest rate of underemployment by consumption expenditure among the males (26.5 percent) is recorded in the Afram Basin, females recorded their highest rate of 20.3 percent in the Northern Agricultural Zone.



NAZ	27.7	49.8	21.3	20.3
AfB	28.7	64.7	26.5	8.4
SHZ	37.6	43.1	11.4	12.0
All	31.3	52.5	19.8	13.6

Figure 3a: Proportion of poor underemployed nonfarm operators by sex (percent)
Source: Authors' calculation based on GLSS 5+ data

Compared to household nonfarm enterprise operators, underemployment among farmers appears relatively lower (Figure 3b). The data also suggests underemployment by hours worked among males as slightly higher (14.6 percent) than the females (13.6 percent). Afram Basin recorded the highest rate among both males and females. However, the highest underemployment by consumption expenditure for both males and females are recorded in the Northern Agricultural Zone. This lends credence to the reports of various surveys in Ghana that have all indicated general poverty rate at the north as the highest in the country.



NAZ	13.2	11.5	27.1	55.3
AfB	18.9	14.9	21.8	10.9
SHZ	11.7	14.5	12.7	8.7
All	14.6	13.6	20.5	25.0

Figure 3b: Proportion of poor underemployed farmers, by sex
Source: Authors' calculation based on GLSS 5+ data

Econometric Analysis

The econometric analysis begun with an attempt to deal with suspected multicollinearity among the independent variables. This became necessary because of the categorical nature of some of the explanatory variables (Wissmann et al., 2007). Thereafter, linear and probit regressions were employed on some selected explanatory variables to determine the causes of poverty among both the household nonfarm operators and the farmers in the MiDA intervention zone (Table 1a and Table 1b). While the linear regression had consumption expenditure as its dependent variable, the probit regression adopted a dichotomous variable; working poor = 1, otherwise = 0, as its dependent variable. Operators of nonfarm household enterprises are considered by the study as those who either operate only a household nonfarm enterprise or whose main occupation happened to be a nonfarm enterprise. This means that an operator of a nonfarm enterprise may also be doing farming as a minor occupation. In the same vein, some farmers may also have nonfarm enterprises as minor occupation. The explanatory variables for both models include: age of the worker, male household, education, marital status, area of residence, access to credit, dependency ratio, labour inefficiency and underemployment.

Test of multicollinearity

The problem of multicollinearity has remained at the centre of attraction in the literature of regression analysis, especially those with categorical independent variables. It arises when the explanatory variables in the linear regression model are correlated and thus one or more columns of the design matrix form a 'near' linear combination with other columns (Wissmann, 2007). Therefore, before proceeding to empirically examine the determinants of working poverty, we employed Pearson Correlation Coefficient strategy on the explanatory variables to ascertain whether the presence of the multicollinearity could affect the results of the regression. Table 2a and Table 2b illustrate the results of the Pearson Correlation Coefficient respectively for the nonfarm operators and the farmers. Anderson et al. (1990) suggested a simple *rule of thumb* that any correlation coefficient exceeding (0.70) shows a potential multicollinearity problem that needs to be dealt with. It is therefore concluded based on this suggestion that none of the explanatory variables exhibited any serious multicollinearity problem with another. This means that the final outcome of the econometric regressions could not be affected by a multicollinearity problem earlier suspected.

Table 1a: Selected variables for multicollinearity test and their symbols (Household nonfarm enterprise)

Age	A
Male household head	B
Married/consensual union	C
Separated/widowed/divorced	D
Never married	E
Urban	F
Northern Agricultural Zone	G
Afram Basin	H
Southern Horticultural Zone	I
No formal education	J
Basic Education	K
Secondary/higher education	L
Operate farm	M
Have access to credit	N
Size of non-working household members	O
Remittances received	P
Labour inefficiency	Q
Visible underemployment	R

Table 1b: The selected variables for multicollinearity test and their symbols (Farmers)

Age	A
Male household head	B
Married/consensual union	C
Separated/widowed/divorced	D
Never married	E
Urban	F
Northern Agricultural Zone	G
Afram Basin	H
Southern Horticultural Zone	I
No formal education	J
Basic Education	K
Secondary/higher education	L
Access to land	M
Use of fertilizer	N
Extension services	O
Size of non-working household members	P
Remittances received	Q
Labour inefficiency	R
Visible underemployment	S

Table 2a: Correlation matrix on some selected variables (Household Nonfarm Operators)

Variables	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
A	1.00																
B	0.18	1.00															
C	0.21	-0.13	1.00														
D	0.18	-0.29	0.84	1.00													
E	0.00	-0.03	0.00	0.00	1.00												
F	-0.09	0.06	-0.12	-0.08	-0.01	1.00											
G	0.01	0.08	0.00	-0.01	0.04	-0.12	1.00										
H	0.04	-0.10	0.07	0.05	-0.03	-0.44	-0.84	1.00									
I	-0.01	-0.03	0.03	-0.01	-0.14	0.13	0.01	-0.08	1.00								
J	0.00	0.06	0.03	0.03	0.02	-0.12	0.00	0.07	-0.76	1.00							
K	-0.07	-0.04	-0.10	-0.08	0.15	0.03	0.02	-0.03	-0.23	-0.28	1.00						
L	0.11	0.09	-0.05	-0.04	-0.22	0.06	0.06	-0.09	0.05	-0.02	-0.03	1.00					
M	0.03	-0.07	0.05	0.05	0.05	0.00	-0.01	0.00	-0.09	0.04	0.13	-0.06	1.00				
N	0.15	0.26	-0.19	-0.17	-0.04	0.07	0.08	-0.11	0.07	-0.03	-0.05	0.11	0.06	1.00			
O	0.08	0.01	0.01	-0.01	0.08	-0.07	-0.01	0.04	0.01	-0.04	0.05	-0.04	0.01	-0.02	1.00		
P	-0.21	-0.07	0.05	0.06	0.04	-0.09	-0.06	0.11	0.10	-0.06	-0.06	-0.15	-0.07	0.02	-0.01	1.00	
Q	0.03	0.11	-0.11	-0.11	-0.08	-0.02	-0.05	0.06	0.08	-0.02	-0.05	-0.01	0.00	0.21	-0.04	-0.02	1.00

Source: Authors' calculation based on GLSS 5+ data

Table 2b: Correlation matrix on some selected variables (Farmers)

Variable	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
A	1.00																		
B	0.06	1.00																	
C	0.00	-0.16	1.00																
D	0.27	0.29	-0.72	1.00															
E	-0.31	-0.06	-0.38	-0.12	1.00														
F	0.01	-0.05	0.06	-0.10	0.08	1.00													
G	-0.17	-0.16	0.11	-0.16	0.07	0.11	1.00												
H	0.08	0.11	0.01	0.08	-0.08	0.06	-0.15	1.00											
I	0.05	0.01	-0.08	0.03	0.02	-0.13	-0.30	-0.76	1.00										
J	-0.03	0.22	-0.08	0.16	-0.11	-0.11	0.05	0.04	-0.06	1.00									
K	-0.01	-0.14	0.05	-0.10	0.02	-0.04	-0.17	0.04	0.08	-0.29	1.00								
L	0.05	-0.10	0.04	-0.07	0.12	0.20	0.16	-0.10	-0.02	-0.36	-0.43	1.00							
M	-0.04	-0.05	0.13	-0.09	-0.06	0.05	0.00	-0.02	0.02	0.05	-0.03	-0.03	1.00						
N	-0.11	-0.07	-0.05	-0.01	0.05	-0.07	0.08	-0.06	0.00	-0.02	0.01	0.01	0.16	1.00					
O	0.05	-0.07	-0.02	-0.01	0.04	0.02	0.12	0.07	-0.14	-0.10	0.04	0.07	-0.01	0.17	1.00				
P	0.10	-0.09	0.31	-0.24	-0.30	0.01	0.12	-0.06	-0.03	-0.02	0.04	-0.02	0.09	0.03	0.04	1.00			
Q	0.24	0.20	-0.09	0.16	-0.03	-0.02	-0.01	0.11	-0.09	0.05	-0.06	0.01	-0.06	-0.01	0.03	-0.08	1.00		
R	0.01	-0.01	-0.22	0.21	0.11	-0.16	0.07	0.14	-0.17	0.03	-0.01	-0.03	-0.04	0.07	0.19	-0.10	0.12	1.00	
S	0.10	0.07	-0.11	0.10	0.04	0.02	-0.04	-0.01	0.04	-0.02	-0.04	0.08	0.02	-0.04	-0.01	-0.04	0.09	0.01	1.00

Source: Authors' calculation based on GLSS 5+ data

Causes of poverty among the nonfarm operators

The two analytical models (the linear and the probit regressions) the study employed in analysing the causes of working poverty exhibited some variations with regard to statistical significance of the set of explanatory variables. For instance, while results from the linear regression indicate age as statistically insignificant determinant of poverty among the household nonfarm operators, the results of the probit regression on the other hand indicate probability of a year increase in the age of an operator as reducing poverty by about 1.6 percentage points (Table 3a). In the same manner, the probit regression suggests gender of the household (being a male household head) as having a potential to reduce probability of an individual operator becoming poor. This appears to confirm a study by Jose and Collado (2004) who found male-headed households as having higher welfare than female-headed households.

In the case of the marital status, the results of the linear regression indicate a negative effect on household consumption welfare. This means that the married couples are more likely to be become poor compared to those who have never married before. While marriage itself may not cause an individual to become poor, the marriage couples tend to have more dependents and as Jose and Collado (2004) explained "....households headed by non-single persons ceteris paribus tend to be poorer than those headed by single individuals" (p 13).

Also, it came out of both linear and probit regressions that residence in an urban has a strong association with working poverty. The signs, positive for the linear regression and negative for the probit regression, imply that when all other factors are held constant, residence in an urban would contribute to reduction of working poverty. This outcome is consistent (Datt et al., 2000; Jose and Collado, 2004) who all found the dept and severity of poverty in rural areas as being higher than in urban. Additionally, the results of the probit regression indicate a 4.6 percentage point reduction in poverty as an operator moves to Afram Basin instead of operating in the Northern Horticultural Zone. This confirms findings of studies (GSS, 2008) that have described the poverty in the northern Ghana as higher than it is the rest of the country.

The results from both the linear and probit regressions also show acquisition of secondary or higher education as reducing the probability of an operator from falling into the poverty trap. This is consistent with studies (Schultz, 1961; Becker, 1964; Bartel and Lichtenberg, 1991, **Saxton, 2000;** Owusu et al., 2010) which have all acknowledged that acquisition of formal education increases individual's value in the labour market. Since day to day operations of household nonfarm enterprises involve some arithmetic and

writing, it is important that operators acquire formal education in order to be more efficient. **Osinubi (2003) explained this better:**
In the case of educational status, there are two implications of the result. Firstly, the higher the level or number of years of schooling, the better-exposed one is and also more enlightened. Hence one is adequately informed to devote a sizeable amount of the household income to basic need to maintain a particular level of standard of living suitable to his level of educational standard. Secondly, income and educational status tends to move together in the same direction. Therefore, with improvement in the level of education, one is better placed in terms of income generation and therefore enhanced the purchasing power of the person and thereby improving his standard of living and poverty level (p. 22).

The size of non-working household members, defined by the study as household members who are not working because of age, schooling/training or other issues such as health, is found out by the linear regression as reducing the probability of consumption expenditure (welfare) by about 7.9 percentage points. This is because household non-working members (dependents) tend to share the little income operators generate, thereby making it difficult for the rest of the household members to save enough income to upgrade their skills and as **Gammage (1997) put it:**
In poor households where there has been a consistent attrition of income earners and where demographic dependency ratios are also high, individuals are often unable to upgrade human capital or to switch into higher return productive activities (p 35).

Again, results from both regressions (linear and probit) indicate remittances received by operators as having significant statistical influence on their welfare status. This confirms a finding by Gammage (1997) who noted that some households could be lifted out of poverty by their receipt of remittances. This is consistent with the revelation in the literature that higher dependency ratio increases household poverty (Bank of Israel, 2003).

Expectedly, labour inefficiency came out in the probit regression as having positive impact on working poverty. For example, a unit increase in labour inefficiency tends to heighten the chances of an operator of nonfarm enterprise falling into poverty trap by about 3.5 percentage points. This means that as operators become more inefficient, the higher is their probability of becoming poor. Relating to this outcome is the underemployment by hours worked which also came out from both regression as statistically significant. As suspected, the results of the linear regression indicate underemployment by hours worked as reducing welfare while the results of the probit regression also appears to support working poverty. This seems to confirm the suspicion expressed by Sackey and Osei (2006) on the possibility of underemployment having empirical impact on poverty.

Table 3a: Determinants of working poverty among operators of household nonfarm enterprises in the MiDA intervention zones [Probit Estimation]

	Linear regression (OLS regression)		Discrete regression (Probit regression)	
Variable	*Coefficient*	*t-statistics*	*Marginal effects*	*t-statistics*
Demographic Characteristics				
Age	0.038	1.03	-0.016	-2.62**
Male household head	1.032	0.90	-0.151	-1.93*
Married	-0.467	-1.76*	0.045	0.77
Widowed/separated/divorced	0.322	1.08	-0.043	-0.59
Geographical Location				
Urban	2.208	3.14***	-0.086	-1.88*
MiDA Zone (Northern Zone as reference)				
Southern Agricultural Zone	0.947	0.65	-0.111	-1.32
Afram Basin	0.823	0.96	-0.046	-2.54**
Educational Status				
Basic	0.009	0.01	-0.026	-0.57
Secondary school or higher	0.846	2.35*	-0.184	-2.70**
Operate farm	-0.884	-0.94	-0.068	-1.17
Access to credit	-1.163	-1.05	0.040	0.51
Size of non-working household members	-0.079	-2.17*	0.029	0.65
Remittances received	2.362	2.91**	-0.152	-2.64**
Labour inefficiency	-0.997	-0.38	0.350	2.08**
Underemployment	-6.198	-6.50***	0.096	2.02*
Diagnostic Statistics				
Constant	8.770	3.97	0.106	0.38
Number of observation	712		2,234	
R-squared	0.3815		–	
Adjusted R-squared	0.3532		–	
Pseudo R-squared	–		0.2589	
Probability > F	0.0000		0.0000	

Significance Level: 1 %(***), 5 %(**), 10 %(*)

Causes of poverty among farmers

Linear and probit regressions were separately carried out to examine the causes of poverty among farmers in the MiDA intervention zone (Table 3b). The data (linear regression) suggest age as statistically significant with an additional age of a farmer reducing the probability of working poverty by about 5.6 percentage points. This means that as one advances in age he/she tends to gather experience needed to be a successful farmer.

In line with the traditional approach to explore the gender dimensions of poverty (Barros, Fox and Mendonça 1993; Appleton 1996; Buvinic and Gupta 1997), **the study** used headship as a gender characteristic that might be correlated with a higher incidence of poverty. The assumption is that households that are headed by female may demonstrate a greater predisposition to poverty than households that are headed by males **(Gammage, 1997;** Jose & Collado, 2004). In line with this conjecture, the results of the probit regression indicate male-headship of household as being associated with about 3.8 per cent reduction of poverty by a farmer. While household headship goes with responsibility (Sackey & Osei, 2006), male farmers have higher tendency to succeed because of the difficulty nature of farming work. This therefore might explain why male household heads who are farmers are more successful.

Just like the operators of the nonfarm enterprises, *being married* came out as statistically significant determinant of poverty among the farmers. Additionally, being resident in the urban also came out as having a tendency to increase the probability of consumption expenditure (linear regression) or reduce the probability of poverty (probit regression). This is not only consistent with the econometric results for the nonfarm operators but also confirms the findings by studies by Datt et al. (2000) and Jose and Collado (2004).

Moreover, farming either in the Southern Horticultural Zone or in the Afram Basin instead of Northern Agricultural Zone appears to place a farmer in a better position to overcome poverty. The results confirm a report by Ghana Statistical Service (2008) that seems to suggest poverty situation in the north as the worst in the country. This is so especially because, rainfall which happens to be the single most important determinant of agricultural productivity, is comparatively very low in the northern part of Ghana.

Just like the results of the nonfarm operators, acquisition of formal education (both at the basic level or secondary/higher level) emerged as statistically significant with negative sign for the probit regression. The positive sign of an acquisition of *secondary or higher* level of education as indicated by the linear regression also means formal education at the higher would increase the probability of consumption expenditure (welfare). This means that as individual farmer acquires formal education, the chances of becoming a working poor tend to decline. This outcome is consistent with several studies (Lockheed et al. 1980; Ray 1998; Psacharopoulos 1994; Psacharopoulos and Patrinos 2002; Ravallion and Datt 2002; Ngo 2006) and might be rightly so because an educated farmer can easily learn and adjust to new technology to boost efficiency and for that matter increase labour returns.

Again, the data (linear regression) suggest *access to land* and the *use of fertilizer* as being associated with increase in welfare. This means that farmers who have access to land and can also afford and apply fertilizer eventually get higher yields and therefore more income. With regard to the use of fertilizer, the results might not be too conclusive since it is also possible that farmers who can afford fertilizer are already better-off. In other words, there could be a bi-causality sort of relationship between use of fertilizer and consumption expenditure.

The number of household members not working (dependency ratio) came out as statistically significant with a negative impact on welfare (linear regression). This means that an inclusion of one more additional non-working household member increases the probability of working poverty of a farmer by about 32 per cent. This is, to some extent, consistent with Brucks et. al. (2007) who found that having more children was negatively related to household consumption.

In consistent with the literature (Osmani, 2003), labour inefficiency emerged as a factor that would increase the probability of working poverty among farmers in the MiDA intervention zones. For example, a unit increase in labour inefficiency (probit regression) would increase the probability of a farmer's poverty by 20.8 percentage points. This is simply because an inefficient farmer tends to waste inputs thereby having just a little to show at the end of each farming season compared to an efficient farmer who is able to produce enough in the face of daunting challenges.
Again, and as expected, underemployment appears to have a negative impact on consumption expenditure (Osmani, 2003; OECD, 2003; Sackey and Osei, 2006). For example, a unit increase in underemployment by hours worked is associated with 8.6 per cent reduction in welfare of a farmer. Therefore, that underemployment is very high in the MiDA intervention zone among farmers might explain why some farmers seem to be working but can hardly secure an end meet.

Table 3b: Determinants of working poverty among farmers in the MiDA intervention zones [Probit Estimation]

	Linear regression (OLS regression)		Discrete regression (Probit regression)	
Variable	*Marginal effects*	*t-statistics*	*Marginal effects*	*t-statistics*
Demographic Characteristics				
Age	0.056	3.23**	0.001	0.77
Male household head	0.759	1.47	-0.038	-2.46*
Married	-0.123	-6.42***	0.012	0.40
Widowed/separated/divorced	1.315	1.64	-0.010	-0.27
Geographical Location				
Urban (compared to rural)	0.319	4.58***	-0.127	-6.85***
MIDA Zones (*Northern Agricultural Zone as reference*)				
Southern Horticultural	0.894	3.29**	-0.150	-4.33***
Afram Basin	0.224	5.29***	-0.023	-1.01
Educational Status				
Basic	0.120	0.32	-0.067	-3.41**
Secondary school or higher	1.801	11.81***	-0.089	-3.81***
Access to land	0.012	2.58*	-0.001	-1.57
Fertilizer use	1.621	2.90**	-0.046	-1.48
Extension services	0.105	0.22	0.034	1.28
Size of non-working household members	-0.319	-4.03***	0.014	0.37
Remittances received	1.168	2.92**	0.004	0.21
Labour inefficiency	-1.989	-1.80*	-0.208	-3.58***
Underemployment	-0.086	-1.88*	-0.003	-0.18
Diagnostic Statistics				
Constant	3.792	2.23	0.106	0.38
Number of observation	826		2,615	
R-squared	0.3156		–	
Adjusted R-squared	0.3102		–	
Pseudo R-square	–		0.1348	
Probability > F	0.0000		0.0000	

Source: Authors' calculation based on GLSS 5+ data

Significance Level: 1 %(***), 5 %(**), 10 %(*)

Summary of findings

The study finds the following *individual-based* economic exclusion factors as explaining poverty among informal sector workers: age, marital status, educational attainment and labour inefficiency. While these individual-based factors are personal characteristics of the informal sector workers, the study also found *group-based* economic exclusion factors that are peculiar to the communities of the workers as being inclusive of geographical location, access to land, underemployment and size of non-working household members. It is therefore concluded that poverty among informal sector workers in Ghana is characterised by both group-based and individual-based economic exclusion factors.

Policy recommendations

Based on the findings that some informal sector workers are poor, the study recommends that poverty reduction strategies in Ghana should give equal attention to people who are working and yet can barely afford goods and service necessary to meet the minimum standard of living. Since these people are mostly self-employed in the informal economy, a special financial package can be set aside to help them improve their lot. In so doing, they would be able to contribute meaningfully to the socio-economic advancement of the country.

Women tend to share almost all they get with their households compared to the men who have high inclination to spend outside the household. Having therefore identified women as doing so well with the nonfarm enterprises but less better in the farm, policies should be put in place to encourage more women to use their relative advantage in household nonfarm enterprises to purge themselves out of poverty. Not only would such a measure help reduce household poverty; it would ultimately have positive impact on the standard of the national welfare.

Having realised formal education as number one enemy to poverty among informal sector workers in Ghana, we recommend to the Government and its development partners to do more than what is currently being done in order to make education more accessible and affordable to these group of people. Even though policies such capitation grant, school feeding programme, free school uniforms and removal of school under tree are all right steps towards the ultimate direction of getting all school going children educated, other policies are needed to ensure that parents comply with the tenets of 'free basic compulsory' to send all their children of school going age to school.

That living in the urban tends to reduce the probability of a worker becoming poor is simply because there are certain facilities in the urban that do not encourage poverty. The gap between development in the rural areas and the urban is too wide. While rural electrification programme has made so much gain in trying to bridge this gap, there is still more to be done. Government should therefore take it as a matter of urgency to put in place pragmatic policies and programmes that will make rural areas better than they are now. For example, small factories could be set up in the rural areas to buy and process perishable farm produce such as tomatoes. Road network between the urban and the rural should be improved to provide smooth movement of goods and services between tne urban and the rural areas of the country. Finally, having identified low labour inefficiency and underemployment as proximate causes of poverty among informal sector workers, it is recommended that poverty strategy programmes are appropriately designed to tackle working poverty from these two angles.

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