THE LINK BETWEEN POVERTY AND SOCIAL EXCLUSION IN GHANA: AN ECONOMETRIC APPROACH

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Abstract
Poverty and exclusion are two interrelated concepts and each one reinforces the other. Theoretically, it is postulated that there is a connection between social exclusion and poverty. In other words, exclusion affects poverty through several channels but this link has not been tested econometrically in Ghana. Therefore, this study examines the link between poverty and social exclusion using the Probit and 2SLS estimation technique with the view to isolating the relevant social exclusion factors that significantly account for poverty for policy purposes. The data used for the study were extracted from GLSS 5. The study reveals that education plays a major role in poverty reduction. Poverty is associated with age and household size in a non linear fashion. In other words, the effect of age on poverty follows a certain pattern. Individuals who are excluded from employment are more likely to be poor. The policy implications are that government should take human capital development seriously. Again, there must be efforts to address social exclusion since it affects poverty.

Keywords: Poverty, social exclusion, econometrics, unemployment, inequality, vulnerability.

Introduction

The purpose of this study is to examine the link between poverty and social exclusion using econometrical approach, with the view to isolating the factors that are critical and significant in explaining poverty for policy purposes. Theoretically, it is postulated that there is a link between poverty and social exclusion. However, the link between poverty and social exclusion factors has not been extensively investigated and tested econometrically in Ghana. Therefore, this study seeks to unravel the social exclusion factors that impact on poverty for policy purposes.

In the 1990s particular attention was paid to the concept of poverty, vulnerability and exclusion. According to Sen (1967), one cannot talk about development without talking about equity and poverty reduction, implying that poverty and inequality are somewhat closely linked to development. Yet, Todaro and Smith (2003) maintained that "development is a multidimensional process involving major changes in social structure...the reduction of inequality and eradication of poverty" (p. 17). This led to the need of reduction in inequality, unemployment and eradication of poverty. Consequently, increasing attention was paid to reduction in poverty and inequality, since, a country's economic development is embedded in its social organization, and addressing structural inequities requires not only economic changes but also societal transformation (Stiglitz, 1998). This new focus of development and given several declarations by the United Nations Development Programme (UNDP) led to the resurgence of interest in the relationship between social exclusion and poverty. Particularly, the concept of exclusion has gained considerable attention in the theoretical and empirical literature since the deep economic and social transformations in Western countries, coupled with decades of theoretical and empirical research.

Devicienti and Poggi (2007) argue that the dynamics of poverty and social exclusion are found to be interrelated, with positive spillover effects that make the two processes mutually reinforcing. The Department for International Development (DFID) report argues that social exclusion is often a cause of poverty (DFID, 2005). If we aim to reduce poverty and social exclusion effectively, there is the need to recognize social exclusion as a problem as well as to understand its effect on the later. In the World Bank's view, "Discrimination on the basis of gender, ethnicity, race, religion, or social status can lead to social exclusion and lock people into long-term poverty traps" (World Bank, 2000: 117). The implication is that exclusion factors (agents of social exclusion) have as one of its end product poverty. However, this inter-linkage between poverty and exclusion factors has not been extensively investigated econometrically in Ghana. Again, the identification of the relevant aspects of social exclusion is still being debated, despite considerable advances in its measurement (Bossert, D'Ambrosio

& Peragine, 2005; Chakravarty & D'Ambrosio, 2006), in the empirical identification of the socially excluded (Whelan et al., 2002; Tsakloglou & Papadopoulos, 2002a and 2002b), or in the study of the dynamics of social exclusion (Poggi, 2007a and 2007b; Poggi & Ramos 2007).

Theoretical Considerations of Poverty and Social Exclusion

Social exclusion is defined as processes that, fully or partially, exclude individuals or groups from social, economic and cultural networks and has been linked to the idea of citizenship (Lee & Murie, 1999). Social exclusion has been defined as "the process through which individuals or groups are wholly or partially excluded from the society in which they live" (European Foundation for the Improvement of Living and Working Conditions, 1995. cited in de Haan and Maxwell 1998: 2). Similarly, EU (2004) define *Social exclusion as* a process in which particular individuals are pushed to the edge of society and hindered from participating fully by virtue of their poverty, or lack of basic competencies and lifelong learning opportunities, or as a result of discrimination". Social exclusion is not poverty. It is possible to be excluded without being poor, nonetheless many poor people are 'excluded' and increasing attention on exclusion allows a broader view of deprivation and disadvantage than is allowed by a considering 'poverty' in narrow sense[1]. With reference to other poverty debates, the concept of social exclusion has been linked to notions of 'relative poverty[2]' (de Haan, 1998: 14-15).

To identify socially excluded individuals, Atkinson (1999) suggested three key elements. These are relativity, agency and dynamics. Social exclusion involves the 'exclusion' of people from a particular society, so in order to judge if a person is excluded or not, there is the need to observe the person relative to the context of the rest of the society s/he lives in. Moreover, exclusion implies a voluntary act (agency) and depends on how situations and circumstances develop (dynamic process). Another prominent characteristic of social exclusion is its

[1] Poverty is narrowly defined as income poverty. And has being also define as ability to participate in society (Black et al (2009)Dictionary of Economics, 3ed. Oxford university Press. New York).

[2] Relative poverty is definition (see UNDP 2006 on POVERTY, unemployment and social Exclusion Crotia)

multidimensional nature. In fact, the European Commission (1992 and 1993) suggests that social exclusion is a dynamic concept one, referring both to processes and consequent situations. It also argues that individuals and groups are excluded from taking part in social exchanges, from the component practices and rights of social integration and identity. Thus social exclusion is felt and shown in the fields of housing, education, health and access to services.

Being excluded can sometimes be in itself a deprivation and this can be of intrinsic importance on its own. For example, not being able to relate to others and to take part in the life of the community can directly impoverish a person's life. It is a loss on its own, and may generate further deprivation. This is a case of constitutive relevance of social exclusion (see Figure 1).

In contrast, there are relational deprivations that could have negative consequences. For example, access to the credit market can lead to other deprivations and income poverty, or the inability to secure enhancing investment opportunities (Yunus, 1998). Causally significant of exclusions of this kind can have great instrumental importance: they may not be impoverishing in themselves, but they can lead to impoverishment of human life through their causal consequences (such as the denial of social and economic opportunities that would be helpful for the persons involved) (Griffin & Khan, 1977; Basu, 1990; Agarwal, 1994; Deininger & Squire 1996).

Another potentially useful distinction is that between active and passive exclusion. When, for example, migrants are not given a usable political status, it is an active exclusion, and this applies to many of the deprivations from which minority communities suffer in Europe and Asia and elsewhere (Ogata, 1998).

When, however, the deprivation/exclusion comes about through social processes in which there is no deliberate attempt to exclude, the exclusion can be seen as a passive kind. A good example is provided by poverty and isolation generated by a sluggish economy and a consequent increased poverty. Both active and passive exclusions may be important, but they are not important in the same way. The distinction is necessary for causal analysis as well as policy response. Relational exclusions may, in some cases, be brought about by a deliberate policy

to exclude some people from some opportunities. For example macroeconomic circumstances that may lead to a significant level of unemployment may not have been devised to bring about that result. Also, when particular groups go through unemployment process, the underlying cause may not have been considered (de Haan, 1998). Even though, such repercussive result was most of the times not intended, it does not bail-out government from responsibility, and not merely the things that are directly "caused" by its own policies. Nevertheless, for causal analysis it may be important to distinguish between the active fostering of an exclusion—whether done by the government or by any other willful agent—and a passive development of an exclusion that may result from a set of circumstances without such volitional immediacy.

Again, the various definitions of social exclusion as stressed by Silver (1994) defined the various perspectives in which policy to combat poverty are framed. Following his argument, three main paradigms could be derived from the review of the contextual definition of social exclusion. The French tradition, drawing on Rousseau, emphasizes solidarity and the idea of the state as the embodiment of the general will of the nation. Exclusion results from the break of social bond (cultural and moral) between the individual and society. In this tradition political right and duties are given high significance. The poor, unemployed and ethnic minorities are defined as outsiders.

In an Anglo-Saxon tradition, the main theoretical differences appears to be the fact that 'poverty' is seen as a problem which is separate from 'social exclusion' rather than as an element of social exclusion. The Anglo-Saxon tradition is characterized by Silver as a specialization paradigm, drawing on liberal thinkers like Locke. This views social actors, primarily as individuals, who are able to move across boundaries of social differentiation and economic divisions of labor. Exclusion is as a result of unenforced rights and market failures. Liberal models emphasize the contractual exchange of rights and obligations. In this paradigm exclusion reflects discrimination, the drawing of group distinctions that denies individuals full participation in exchange or interaction.

Some definitions of social exclusion neglect power and opposing interests amongst different social groups which may neutralize poverty and inequality (Jordan 1996). The third paradigm described in Silver's work is the 'monopoly paradigm[3]'. Unlike the liberal tradition, the monopoly paradigm places emphasis on power relations in the constitution of a social order. Group monopolies are seen as responsible for exclusion. Powerful groups restrict the access of outsiders through social closure. Inequality is thought to overlap with such group distinctions, but it is mitigated by social democratic citizenship and participation in the community.

In modern development concepts, economic growth has been seen as an antidote for poverty reduction through the trickledown mechanism. In this argument, the cardinal approach has been on individual and market concepts. Poverty is as such seen as individual problem. An example of this is Rowntree's work on "basic needs". The poor are seen as those who cannot afford necessities of life. The approach is different from the eighteenth century economists' concern in that it is welfarist, but it is similar in that it focuses on the individual and on individual utility.

As in the basic needs approach, the analytical focus of poverty and assessment in developing countries using absolute poverty lines is at the individual or household level. This is clearly distinct from a French revolution concept of social exclusion with broader focus on society and the individual's ties to society (Edwin & Petcharamesree, 2003). Lack of basic needs is the central argument in such analysis, instead of the mechanisms that lead to exclusion from access of the basic needs. Poverty analyses do not only focus on the poor, but include the study of the 'correlates' of poverty. The notion of 'relative deprivation' is more closely associated with concept of social exclusion, and it is often noted that rising inequality in various countries has contributed to the popularity of the notion of social exclusion. Townsend de-emphasizes the concept

[3] See Silver (1994: 540) and Hickey S and du Toit A (2007) use it to explain power dynamic in employment situation and how it result in unemployment.

of relative deprivation, in which the poverty line is set not as an absolute minimum but is dependent on the country's wealth (Fahey, 2010).

Vulnerability is closely related to the concept of social exclusion. Chambers (1989) explain that vulnerability is not a synonym for poverty. Poverty means lack or want, and is usually measured using income or consumption; vulnerability means insecurity, defenseless, and exposure to risk and shocks. Sen (1981, 2000) has stressed that what matters is not what people possess, but what it enables them to do. Capabilities are *absolute requirements* for full membership of society. He draws attention towards rights, and command over goods, using various economic, political, and social opportunities within the legal system. Sen (1998) welcomes the social exclusion framework, because of its focus on *relational roots of deprivation*. He believes that a social exclusion framework reinforces the understanding of poverty as capability deprivation.

The conceptual framework was developed based on the various definitions and exposition on the relationship between social exclusion and poverty. The study use World Bank (2000: 117) and DFID (2005) exposition on poverty and social exclusion to develop Figure 1. Figure shows the relationships between social exclusion factors and poverty. From the diagram it can be observed that social exclusion can result from several factors that lead to vulnerability and discrimination (eg. Gender, ethnicity, social status, education and other). The literature shows that exclusion in any form leads to poverty and poverty could also lead to exclusion. The result of discrimination is deprivation which leads to poverty and social exclusion. This conceptual framework will also help to formulate an econometric model to empirically test the link between poverty and social exclusion factors for policy analysis.

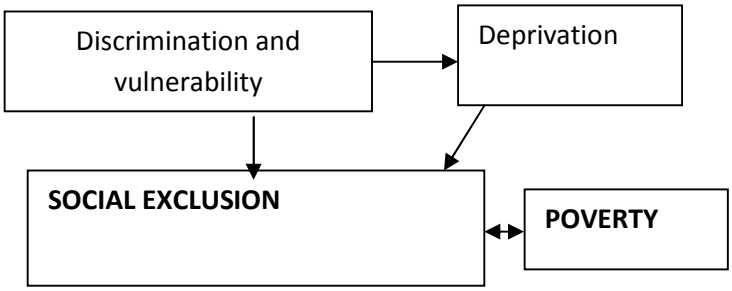

Figure 1: Relationship between exclusion factors and poverty
Source: Authors construct.

Methodology

There are various techniques that can be used to examine the relationship between poverty and social exclusion. The logit regression is used to estimate the econometric model which predicts the relationship between poverty and social exclusion factors. The choice of this approach was informed by the dependent variable which is binary. It is argued that the choice between probit and logit in a discrete choice model is inconsequential and conventionally trivial (Xie &Maski, 2008). The choice of either probit or logit is based on arbitrariness and convenience and not on any theory. And it is widely accepted that the choice between the two is innocuous as far as they yield similar if not the same results (Maddala, 1983: 23; Cox, 1970: 28). The reason for this according to Johnson and Kotz (1970) is that the logistic estimates approximate normal distribution. Therefore, this study comfortably uses the binary logit estimation to assess the link between the social exclusion factors and poverty. The paper categorizes the dependent variable based on the poverty lines used by the GLSS 5.

The study also employs the IVProbit and the Two Stage Least Squares (2SLS). The use of these estimation techniques is due to the possible suspected endogeneity between poverty and exclusion. The source of endogenieity results from simultaneity. Since the source of endogenieity is resulting from simultaneous bias, it is appropriate to use 2SLS. The Ghana Living Standard Survey 5 was used for the estimation of the logit model. The data set was

particularly used because of its focus to measure poverty and vulnerability in Ghana. Hence the data fits perfectly for this analysis.

Model 1 Specification (Probit)

Pov ⟶ f (H_{exc}, I_{exc}, C_{exc}) ……1

Thus poverty is seen as a function of households' characteristics and individual characteristics which serve as exclusion factors.

$$POVi = \alpha + \beta iHHi + \delta_t INDt + \varphi_j COMj \quad \text{.....2}$$

Model 2: (IV and 2SLS)

$$POVi = \alpha + \beta iHHi + \delta_t INDt + \varphi_j COMj + \beta Ex \quad \text{.....3}$$

$$Ex = \alpha_E + \beta iHHi + \delta_t INDt + \varphi_j COMj + \phi Status + \varepsilon_i \quad \text{.....4}$$

From models 1 and 2, the individual variables consists of age of the economic head of the household, sex of the economic head, educational attainment, marital status, migrant, health status and employment status and Tribe of the head. Household level variable was household size. Com is community variable like resident's location and Region.

In modeling the IV and 2SLS, the variable EX is social exclusion and Status is the type of occupation that for an individual. Status is used as an instrument for exclusion. The choice of this instrumental variable is informed by the fact that social status of a person in a society affects the level of participation in society. Once the number of instrument is equal to the number of endogenous variables, it implies that the model is exactly identified hence the use of IV and 2SLS is justified (Woodridge, 2002).

The dependent variable is poverty status (POV). This variable is used to find the link between the social exclusion factors and how they affect poverty. In model 1b, the dependent variable is captured as a discrete binary response variable; thus poor (1) or not poor (0).

The UNDP classified these drivers of exclusion into two: the relational drivers to include gender and age, health status, access to information, spatial inequality (rural-urban disparities and regional disparities) and material drivers (eg: inadequate income) as drivers of exclusion (UNDP, 2007). Inequalities still

exist in terms of gender, race or ethnic origin, religion or belief, disability, age, and social exclusion tends to perpetuate itself in a cycle of deprivation from one generation to the next. Old age is not everywhere synonymous with poverty (Hoff, 2008). Studies have shown correlation between old age and poverty. Pensioners are more likely to be affected by poverty than paid workers (Ogg 2005). Goldfield (2005) shows in an analysis of the British population structure in report that both poverty and wealth correlate with a specific population structure (in terms of age). Goldfield (2005) emphasized that wealthy areas are characterized by high proportions of middle-aged families and empty nesters, but poor neighborhoods have a high proportion of children and older persons.

Poverty may relate to household size. These variables were chosen due to the assumption that these household demographic characteristics are seen to affect poverty and exclusion (Avramov, 2002). The relationship between poverty risk and household size follows a U-shaped pattern. This implies a non linear relationship between poverty and household size.

Widowed women are at greatest risk (Gordon and Townsend 2000). Gordon and Townsend's argument presupposes a link between poverty and marital status. People may migrate in order to improve their livelihoods. Migrants may found themselves in vulnerable situations and thus become further impoverished through their movement. This mean migration of a group or individual could lead to discrimination and vulnerability of such individual or group and may be deprived from employment opportunities and lead to low income.

Education is argued to be one of the main drivers out of poverty and exclusion. Highly educated people stand the chance of having a highly paid job and hence higher income. However, a person with low or no education is more likely to be vulnerable to shocks in the economy and also will be deprived of certain opportunities in society. This will lead to heightened individual risk of being poor.

Social Exclusion

The variable Social exclusion (Ex) is derived following Scutella et al (2009). The paper constructed an index for social exclusion using qualitative measures like if a person can read and write, number of times a person visit the hospital and consultation of a doctor as well as financial stress. The uses of these qualitative index is based on the fact social exclusion is socially constructed hence cannot be measured by rigorous quantitative approach. The simple sum-scores were used following the formula given in Scutella et al (2009). The formula is given as:

$$Ex_i = \sum_{d=1}^{4} x_{id}$$

Where x_{id} is a dummy showing the presence of the characteristic measured. The rank of the variables used in the index is summed up to get the index. In the case of financial stress, individual refused loan given the number of times. 2 and more means individual is deprived. Individual consult a doctor was considered. However, ability to read or write was not considered since education is already an explanatory variable in the model.

Empirical Evidence

The correlation matrix of some the variables are shown in Table 3. The simple Pair wise correlation was use. From Table 3, there is a correlation between poverty and social exclusion. The correlation between exclusion and poverty was 0.1146 and significant at less than 1% significant level. The correlation between the variables is less than 1%. Most of the explanatory variables have positive correlation with dependent variables. However, variables like sex of economic head, employment status and marital status has a negative correlation with poverty.

To ensure that the model estimated was robust, post estimation diagnostics were conducted on the estimated logit equation. The variable omission test was conducted using the Linktest. The null hypothesis is that the model is not correctly specified was rejected at less than 5% alpha level.

Another important assumption when estimating ordinary least squares (OLS) regression Homoskedasticity. Although the estimator of the regression parameters in OLS regression is unbiased when the homoskedasticity assumption is violated, the estimator of the covariance matrix of the parameter estimates can be biased and inconsistent under heteroskedasticity, which can produce significance tests and confidence intervals that can be liberal or conservative. Thus, there is reason to be doubtful of the accuracy of the standard errors and, therefore, of the probability (*p)* values (Hayes and Cai, 2007). However, the result was correct for heteroskedasticity. The Hosmer-Lemeshow (1989) fit test was done to know how well the model is best fitted. The null hypothesis of the model is fit is not rejected given that the fit test is not statistically significant.

The possibility of endogeniety was not explored in this paper. However it must be said that, variables like education may possibly be endogenous. Again, exclusion and poverty have time effects. That is the relationship between exclusion factors and poverty could be influenced by time. Hence there could be unobserved heterogeneity in the model but the model does not address the issue of unobserved heterogeneity.

For the 2SLS and the ivprobit estimation, the exogeniety test was done and in each case, the null of instrument being exogenous was rejected which means that a point Probit or simple OLS will give an inconsistent result. To confirm the choice of model, the Hausman model specification test was specified for ivprobit and probit estimation, the test results show that, instrumental probit estimation is consistent.

From Table 1 in the appendix 1, given the predicted marginal effects, the effect of household size is positive and significantly related to poverty. From the results, social exclusion is positively related to poverty in all the three estimated equations and statistically significant at less than 1% significant level. The marginal effect is indicative of the fact that as the index for exclusion increases in the 2SLS 1.3% point is about and IV probit is about 1.1% points.

From the literature, it is argued that there is a non-linear relationship between poverty and household size. The square of household size is negative.

This confirms the non-linear relationship of Avornu's (2002) assertion that as the household size increases from a lower level to a certain level, poverty level is likely to decrease and after a certain point. The result shows that, as the household size increases, there is a threshold within which it has a diminishing effect on poverty. But as the household size increases, the dependency ratio increases and hence lead to economic hardship on the household leading to poverty. From the estimated equations, the marginal effect was .5492228 for a low household size which square of household size is -.0313382 and both are significant at less than 1% significant level. Similar result is found in equation 4 in Table 1.

The effect of age of the economic head of the household has a statistically significant relationship with the poverty level of a person. Age of economic head is statistically significant at less than five percent alpha level and the square of the age of economic head is significant at less than 1% alpha level. From the estimates, there is a negative relationship between age of the economic head and poverty level. However, the square of age is positively related to poverty level. This confirms the non linear relationship found by other studies. This supports the findings the UNDP (2007) report on Ghana that as an individual grows older or elderly people are more likely to be poor. Also Goldfield (2005) argues that poor neighborhood have a high proportion of elderly or aged. This means that when a household head is within the middle ages and have much strength to work for long hours to earn more income for the household, the poverty levels will be low.

The results in Table 1 show a linear and a negative relationship between poverty and the social exclusion factor "Education". Using no education as a reference point, it is clear that as an individual attains a much higher education level, that individual is less likely to be poor. The individual with a basic level of education is about 0.02808 less likely to be poor. However, if a person has SSCE/GCE or O'Level certificate, probability of being poor reduces by 0.03654 compared with an individual who has no level of education. The various level of attainment is less than one percent significant level. Those who have had tertiary education is about 0.06418 (6.4 percentage points) less likely of being poor. The result supports Saatci and Akpinar (2007) finding that poverty is negatively

related to education. As education level increases, an individual become less likely of being poor. The vulnerability of the individual reduces.

Marital status has a non-linear relationship with poverty. Thus it is positive and turns negative and later turns positive. The individual who is divorced or separated is statistically insignificant. This means that divorced or separated dummy is not an important variable in explaining poverty. The probability of a divorced or separated person being poor is about 0.0878. However, the widowed being poor is .0367998 which is statistically significant at less than 5%. This confirms the finding of Gordon and Townsend (2000) that widows are much more vulnerable to poverty. The various categories of marital status jointly explain weather a person will be poor or not. The results show that a single person is likely to be poor. Thus, a single person is about 0.0634 more likely to be poor than when the person is married or staying with a partner. This result tends to confirm earlier studies that household type may turn to affect the level of poverty of an individual.

Health status is one of the most important factors argued to cause exclusion. This is because a sick person cannot participate in economic and social activities. This result confirms the Sen's capability assertion that health is very relevant in social participation which in turn lead to less deprivation and poverty reduction. The coefficient of health (Not sick/ill or injured) is statistically significant at less than 5%. The marginal effects is however not significant. This supposes that the variable is not important in explaining the differences in probability. The result shows an inverse relationship between poverty and health Status. This implies that, as a person who is healthy is more likely to have a reduced incidence of poverty. The marginal effects indicates about 0.12 percentage points less likeliness of being poor if an individual visited health facility for check up or ailment. Therefore, if an individual is not limited in access to health care, that individual is less likely to have poor health which intern reduces vulnerability and exclusion and help reduce poverty.

From the results of the study, sex (female dummy) plays a significant role in poverty. A household headed by female economic head is less likely to be poor

than a household which is headed by a male. This result confirms the results of other studies on Ghana. This result confirms the results of Annim *et. al.* (2011). This result may be due to the increase advocacy for the right of women. Also, policies turn to give some level of priority to women. An example is admission to academic institution.

Employment status has an influential role in predicting poverty. Employment status has a negative relationship with poverty. An individual who is employed as captured in the model is less vulnerable to poverty. The probability of the employed be poor reduces by -.571 percentage point for ivprobit and 0.063 percentage point for probit model. This result confirms earlier assertion that unemployment leads to poverty. Therefore, an individual who is excluded from economic participation may be poor. In model 4, employment has a negative effect on poverty. If an individual is employed, the person is about 0.0701 less likely to be poor compared to someone who is not working. In all the employment status is negatively related to poverty.

On the effect of regional inequality on poverty, the result shows that all the 10 regions have statistically significant relationship and positively related to poverty, except Eastern region. This means that regional inequality is a dominant factor that entrench the extent of poverty. The result shows that, regional deprivation has it greatest impact in the three Northern regions. The level of impact varies across region. However the three northern regions seem to have the greatest impact, thus 0.3, 0.5 and 0.04 in U/east, u/west and Northern regions respectively.

The location of one settlement is also a factor which may result in deprivation. From the study a rural settlement has a higher probability of being poor. This marginal effect is statistically significant at less than 1%. The probability of being poor is influenced by location of a household. From the result an individual in a rural household is about 0.0408 in model 1, and from model 4, it's about 0.0684. The two estimates gives a different coefficients but almost similar.

From the first stage regression, it is clear that social exclusion is influenced by such factors as age, employment status, marital status, tribe and religion, education and social status among others. It could be concluded that, the processes through which an individual is excluded comes along these factors. As de Haan and Maxwell (1998; 2) and EU (2004) would define social exclusion.

Recommendations

Education is influential in poverty reduction therefore the government should put in place measures that will ensure that the benefits of education get to all Ghanaians. Since, education is prominent in explaining if an individual is deprived in access it has the tendency of leading to elimination from social participation and economic activity, which ends in poverty. The already existing programmes should be strengthened and widened to ensure quality education.

The results presented implied that elderly people may be vulnerable to poverty; therefore the government should put in place measures to reduce the impact of old age on the individuals. Government may consider improved pension schemes and poverty reduction programmes targeting the aged.

Proper civic education on equality and discrimination should be done. Government and policy makers may consider bridging the gap between ethnicity and gender to ensure equal opportunity.

To address social exclusion in Ghana, attention must be on factors marital status, employment and other demographic characteristics of a group or individual. Also, household size was found to impede government measures to combat poverty. It has an enhancing effect on poverty. Therefore, attention must be paid to household size in Ghana as a means of tackling poverty and social exclusion. The study further recommends that, future research should try to address the actual household size that will lead to poverty reduction at the household level

This study did not take into account the time dimension of poverty and social exclusion. Time however is considered crucial in poverty and social exclusion. Therefore, the study did not take into consideration of heterogeneity

resulting from time. It is recommended that future research on Ghana takes into consideration the effect time on poverty and social exclusion.

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Appendix A
Table 1: Estimates of Poverty and Exclusion

		(1)	(2)	(3)	(4)
		probit	IVProbit	Exclusion 1st stage ivprobit	2SLS
EQUATION	VARIABLES	Poverty			
Poverty	Ex1	0.115***	0.0357***		0.00150***
		(0.0166)	(0.00468)		(0.000425)
	hhsize	0.541***	0.540***	0.00318***	0.0603***
		(0.0230)	(0.0227)	(0.000920)	(0.00147)
	hhsq	-0.0308***	-0.0308***	-0.000124	-0.00263***
		(0.00258)	(0.00254)	(0.000108)	(0.000180)
	Sex of eco	-0.419***	-0.422***	-0.00616***	-0.0469***
		(0.0164)	(0.0165)	(0.00145)	(0.00180)
	Age of eco	-0.00804***	-0.00756***	0.000214	3.47e-05
		(0.00270)	(0.00270)	(0.000253)	(0.000378)
	Age square	0.000169***	0.000164***	-6.62e-06**	1.10e-05***
		(2.92e-05)	(2.92e-05)	(2.58e-06)	(4.25e-06)
	Employed	-0.580***	-0.571***	0.0313***	-0.0701***
		(0.0186)	(0.0189)	(0.00146)	(0.00255)
	Divorced	0.446***	0.443***	-0.000471	0.0385***
		(0.0219)	(0.0219)	(0.00196)	(0.00231)
	Widowed/separate	-0.00175	0.000159	-0.0122***	-0.0110***
		(0.0327)	(0.0327)	(0.00256)	(0.00364)
	Single	0.577***	0.583***	-0.00873***	0.0619***
		(0.0290)	(0.0288)	(0.00182)	(0.00208)
	Rural	0.539***	0.535***	0.0233***	0.0684***
		(0.0157)	(0.0157)	(0.00147)	(0.00178)
	Ga	0.115***	0.125***	0.0267***	0.00293
		(0.0272)	(0.0273)	(0.00280)	(0.00238)
	Ewe	0.341***	0.345***	-0.0242***	0.0285***
		(0.0231)	(0.0231)	(0.00198)	(0.00271)
	Others	0.378***	0.385***	-0.0331***	0.0552***
		(0.0221)	(0.0221)	(0.00232)	(0.00327)
	Orthodox	0.0871***	0.0949***	-0.000691	0.0106***
		(0.0208)	(0.0208)	(0.00176)	(0.00223)
	Pentecostal	0.0390*	0.0469**	0.000286	0.00756***
		(0.0235)	(0.0235)	(0.00192)	(0.00239)
	Muslim	-0.103***	-0.109***	0.0243***	-0.0330***
		(0.0299)	(0.0299)	(0.00293)	(0.00413)
	Spiritual	0.239***	0.249***	-0.00160	0.0511***

	(0.0295)	(0.0294)	(0.00290)	(0.00502)
No religion	0.311***	0.313***	-0.00747***	0.0392***
	(0.0278)	(0.0278)	(0.00273)	(0.00397)
Central	0.145***	0.147***	0.00946***	0.0210***
	(0.0304)	(0.0303)	(0.00223)	(0.00313)
G-Accra	0.212***	0.205***	0.0124***	0.0335***
	(0.0310)	(0.0312)	(0.00213)	(0.00275)
Volta	0.120***	0.119***	0.0117***	0.0274***
	(0.0335)	(0.0334)	(0.00259)	(0.00424)
Eastern	-0.0514*	-0.0508*	0.0731***	-0.00152
	(0.0310)	(0.0309)	(0.00298)	(0.00296)
Ashanti	0.252***	0.250***	0.0189***	0.0372***
	(0.0252)	(0.0252)	(0.00189)	(0.00274)
Brong Ahafo	0.265***	0.250***	0.0510***	0.0314***
	(0.0309)	(0.0311)	(0.00327)	(0.00392)
Northern	0.231***	0.235***	0.0224***	0.0458***
	(0.0426)	(0.0424)	(0.00404)	(0.00662)
U/East	1.097***	1.092***	0.00725*	0.309***
	(0.0416)	(0.0417)	(0.00390)	(0.00999)
U/West	2.095***	2.110***	0.0538***	0.557***
	(0.0562)	(0.0566)	(0.00727)	(0.0124)
				0
				(0)
Health status	-0.109***	-0.142***	0.0189***	-0.0167***
	(0.0164)	(0.0159)	(0.00146)	(0.00171)
Basic	-0.283***	-0.280***	0.00288*	-0.0441***
	(0.0148)	(0.0148)	(0.00161)	(0.00205)
Secondary/GCE	-0.477***	-0.471***	0.000563	-0.0656***
	(0.0262)	(0.0260)	(0.00202)	(0.00260)
Post secondary	-0.717***	-0.717***	0.0118***	-0.0836***
	(0.0394)	(0.0396)	(0.00271)	(0.00278)
Tertiary	-2.746***	-2.734***	0.0147***	-0.120***
	(0.335)	(0.337)	(0.00374)	(0.00278)
Social status			1.004***	
			(0.000368)	
Constant	-3.489***	-3.433***	0.936***	-0.125***
	(0.0963)		(0.00665)	(0.0105)
R				0.214
Wald test	12318.86***	12431.29***		14906.61***
Exogeniety		125.36***		
Observation	103,114	103,114	103,114	103,114

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix B

Table 2: Marginal Effects of Probit Estimates

	Ivprobit			**Probit**	
Variable	dy/dx	Std. Err.	Prob.	dy/dx	Prob.
Exc1	.0357239	.00468	0.000	.0087136	0.000
hhsize	.540233	.02266	0.000	.040935	0.000
Hhsq	-.0307757	.00254	0.000	-.0023359	0.000
_IsexEco	-.421786	.01648	0.000	-.0287967	0.003
Ageeco	-.0075553	.0027	0.005	-.0006089	0.000
agesq	.0001641	.00003	0.000	.0000128	0.000
Employed	-.5710698	.01886	0.000	-.0636277	0.000
Divorced	.4428681	.0219	0.000	.0445768	0.957
widowed	.0001586	.03266	0.996	-.0001321	0.000
Single	.5831224	.02883	0.000	.0584517	0.000
Rural	.535103	.01565	0.000	.0408235	0.000
Ga	.1250411	.02729	0.000	.0094136	0.000
Ewe	.3452574	.02312	0.000	.0322663	0.000
Others	.3845596	.02211	0.000	.0356713	0.000
Orthodox	.0948506	.02084	0.000	.0067253	0.103
Pentecostal	.0468997	.02346	0.046	.00301	0.000
Muslim	-.1087803	.02993	0.000	-.0072492	0.000
Spirtiual	.2492865	.02939	0.000	.0219893	0.000
Others	.3132232	.02783	0.000	.0299881	0.000
Central	.1468955	.03035	0.000	.0122022	0.000
G-Accra	.2046732	.03116	0.000	.0179907	0.001
Volta	.1186744	.0334	0.000	.0099233	0.086
Eastern	-.050824	.03086	0.100	-.0037572	0.000
Ashanti	.2499302	.02524	0.000	.0217206	0.000
Brong Ahafo	.2499944	.03109	0.000	.0244845	0.000
Northern	.2352933	.04238	0.000	.0213193	0.000
U/ east	092485	.04166	0.000	.1938853	0.000
U/west	.110043	.05656	0.000	.5655537	0.000
Health	-.1421852	.01594	0.000	-.0078732	0.000
Basic	-.2800483	.01483	0.000	-.0210548	0.000
Secondary	-.4705181	.02603	0.000	-.0264069	0.000
Post sec	-.7167761	.03964	0.000	.0317834	0.000
Tertiary	2.733797	.33728	0.000	-.041012	

Appendix C

Table 3: correlation Matrix between some Explanatory variables

	Poverty	Ex1	hhsize	hhsq	sexeco1	ageeco	Agesq
Poverty	1						
Ex1	0.1146	1					
	0						
Hhsize	0.3772	0.0592	1				
	0	0					
Hhsq	0.3296	0.0395	0.9182	1			
	0	0	0				
Sexeco1	-0.0579	0.202	-0.0226	-0.0432	1		
	0	0	0	0			
Ageeco	0.0679	0.146	-0.0072	0.017	0.1256	1	
	0	0	0.0052	0	0		
Agesq	0.0578	0.1582	-0.0505	-0.0189	0.1366	0.9822	1
	0	0	0	0	0	0	
Employment~t	-0.0999	-0.3167	0.0875	0.0701	-0.1594	-0.163	-0.204
	0	0	0	0	0	0	0
Marital	-0.1438	-0.0463	-0.4471	-0.3198	0.0603	-0.1249	0.0688
	0	0	0	0	0	0	0
Ethnic group	0.341	0.0598	0.2211	0.1949	-0.078	-0.003	-0.0057
	0	0	0	0	0	0.2429	0.0277
Religion	0.1388	0.0749	0.0845	0.0887	-0.1007	0.0536	0.0533
	0	0	0	0	0	0	0
Region	0.376	0.0838	0.2381	0.2164	-0.0323	0.0123	0.0111
	0	0	0	0	0	0	0
Loc2	0.2649	0.0947	0.1902	0.1602	-0.0249	0.1328	0.1303
	0	0	0	0	0	0	0
Migration	-0.0284	0.0175	-0.0146	-0.0189	-0.0032	-0.0163	-0.0131
	0	0	0	0	0.2167	0	0
Health stat	-0.0586	-0.2113	-0.088	-0.0537	0.089	0.1204	0.1332
	0	0	0	0	0	0	0
Education	-0.1443	-0.2641	-0.0452	-0.0346	-0.1008	0.0133	0.0016
	0	0	0	0	0	0	0.606

Test	**Obs**		**p-Value**
Sk test		Pr(skewness) - 5.5e+03	0.00
Shapiro-Wilk	103,114		0.000
Hosmer-Lermer	103,114	5104.50	0.2221
Hausman test	103,114		