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# Demand for Insurance in Ghana: Do Poverty, Employment Status and Demographic Characteristics Matter?

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## Abstract

*The paper answers the question of whether poverty, employment status and demographic characteristics matter in the demand for insurance in Ghana. Using binary logit estimation on the GLSS6 data, we found that the poor have a lower probability of demand for insurance, with locational influence being more pronounced for the poor in the rural areas, while formal salaried workers have higher demand for insurance than self-employed. Again, residents in small cities and rural areas purchase more insurance than metropolitan residents and also, the influence of employment status is more of a rural phenomenon than an urban one. Demand for insurance differ depending on poverty and employment status. Policy must focus on segregating the insurance market to cater for different classes of people.*

**Keywords:** Insurance, Poverty, Employment Status, Gender, Education

**JEL Codes:** D03, D12, D91, G22, J16, J21

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## **Introduction**

In the past, most studies have argued that one major reason why people are unable to purchase insurance is because of low level of income. Aside income levels, poor households are unable to purchase insurance products (health, motor, life) due to constraints posed by household factors. Indeed, as a risky venture, only risk-lovers are more likely to participate in insurance markets (Giesbert, Steiner, & Bendig, 2011). In recent times, demographic characteristics have been identified as very crucial in determining demand for insurance apart from the traditional income levels.

From a theoretical standpoint, insurance is considered a gamble. Applying the law of diminishing marginal utility, risk-averse people prefer a certain gain to an uncertain gain of the equivalent value, therefore insurance purchasers are rational. Another theoretical standpoint shows that poorer people benefit more from insurance of a given monetary sum. However, Kahneman and Tversky (2000) argued that insurance relates to potential loss (rather than a gain) and showed that as the rational individual will prefer an uncertain loss over a certain loss of equivalent expected value, purchasing insurance, to avoid risk, is not rational. Researchers that have sought to ascertain the demand side factors that influence demand for insurance have used the willingness to pay (WTP) approach. A review of some evidence-based studies of WTP for insurance in low-income countries in Africa demonstrated that evaluation of WTP was influenced by socioeconomic and demographic dimensions. This therefore makes demographic factors very prominent parameters, especially from the demand side (Dror & Firth, 2014). Despite this, and considering insurance as a product, the influence of poverty and employment status on insurance demand is very crucial. The reason is that these issues have not been investigated much in the extant literature.

This paper aims at estimating the demand for insurance in Ghana, focusing on the effects of poverty, employment status and household demographic characteristics. It augments the empirical literature on demand for insurance and follows a similar method adopted in previous studies. While some studies have been mainly cross-country, this study focuses on Ghana because cross-country studies do not sometimes allow for the formulation of specific prescriptions for specific countries since conclusions may be general. Moreover, while different studies have looked at poverty and demand for insurance on one hand and demographic characteristics and demand for insurance on the other, this study looks at poverty and demographic characteristics and demand for insurance at the same time.

The study contributes to the fast-growing body of research on the demand for insurance and argues that about insurance patronage, a bottom-up strategy will not work compared to a macro approach of tackling poverty which trickles down to induce high demand for insurance. Thus, the recommendations from this study will offer opportunities for insurance companies to approach consumers with different marketing strategies, depending on their poverty and employment status, demographic and social characteristics. The objective of this study, therefore, is to examine the effect of poverty, employment and demographic characteristics on demand for insurance in Ghana. The next section focuses on the literature review; section three

outlines the methodology; section four presents results and discussion and the last section concludes with policy recommendations.

## **Literature Review**

The poverty literature describes additional concepts that influence decision-making, namely time preferences and poor households' risk aversion against risky investments. This literature suggests that households are expected to become increasingly risk averse as they move closer to the poverty line, as any further drop in income can push them below the survival point (Wagstaff, 2000). Poor households who are more likely to have credit constraints in the future may be more willing to sacrifice current income and buy insurance in order to have less risk in future (Morduch, 1995). According to concepts of time preferences, those with a higher value for future protection than current consumption are more likely to purchase insurance (Gillis et al., 2001). Moreover, the poor might not insure, since they may, based on necessity, have to choose present over future consumption.

The permanent income hypothesis presumes that consumption pattern of consumers is expected to fluctuate over their lifetime, and income is expected to drop substantially during retirement. The theory posits that people make consumption and saving decisions based on their long-run expectations of future flows of income. Although people expect current income to vary during their lifetime, their consumption patterns remain constant as a proportion of their expected permanent income. Therefore, they shift income from high income periods to low income in order to keep consumption patterns constant (Bryant, 2006). Ando and Modigliani (1963) developed the life cycle hypothesis which presents a linkage between consumption and current income and future expected income of the consumer over his or her lifetime. The life cycle hypothesis states that, an individual's income will be low at the early stage of life and high during the middle years of life. Because short term insurance policy has a relatively low cost, it can be suitable for persons with low incomes and high insurance needs. Therefore, households with lower incomes may opt for short term insurance (Li, 2008).

Attempts have been made to classify insurance into different categories by many individuals and institutions (Afriyie, 2006). Some classify insurance under the categories of life, fire, marine and miscellaneous while others classify it under different sub-titles such as insurance of person, insurance of property, insurance of interest and insurance of liability. In a broad term, insurance can be classified into Life insurance and Non-life insurance.

Recent empirical research on insurance markets by Browne, Chung, and Frees (2000), Ward and Zurbruegg (2002), Beck and Webb (2003) and Esho, et al. (2004) have shown that demand for insurance within an economy is influenced by economic, legal, political, and social factors. However, socio-demographic factors have also been found to be highly significant in predicting insurance demand. Baek and De Vaney (2005), for instance, found that age has significant positive effect on insurance demand. However, Chen, Wong and Lee (2001) and Lin and Grace (2007) in their studies concluded that age relate negatively with insurance demand. Nevertheless, in a study on determinants of life insurance, Gandolfi and Miners (1996) found

that age does not influence demand for insurance. Again, Baek and de Vaney (2005) found that increase in level of education leads to increase in demand for insurance as education tends to be a good predictor of long term earning ability and this concurs with Gandolfi and Miners (1996).

However, according to Beck and Webb (2003), education appears not to have any significant influence on insurance consumption. Additionally, Li, Moshirian, Nguyen, and Wee (2007) point out that larger duration of education, measured in average years of schooling, leads to a longer pressure of offspring's dependency, which contributes to a higher demand for life insurance products to protect the dependents. Considering insurance as a form of savings, women are more likely to purchase insurance compared to men because of their risk-averse nature and the fact that women sometimes seek protection for their financial resources (Faff, Mulino, & Chai, 2008). Goldsmith (1983) investigated the relation between wife's human capital accumulation and household purchases of insurance on the husband. He found that, households with a highly educated wife, *ceteris paribus*, have a lower likelihood of purchasing term insurance on the husband. He suggested that household characteristics and the decision-making environment are important determinants for a household's insurance purchasing behaviour.

Historically, religion has provided a strong source of cultural opposition to insurance with some religious groups believing that a reliance on insurance represents a distrust of God's protective care. Enz (2000) and Ward and Zurbruegg (2002) test whether countries with a strong Islamic background have a reduced demand for life insurance consumption. Their results confirm that consumers in Islamic nations such as the United Arab Emirates, Qatar, and Kuwait purchase less insurance (life) policy. According to Zelizer (1979), religion generally provides a cultural opposition to the demand for life insurance with some religious groups having the belief that purchasing an insurance package is tantamount to distrusting God's protective care. Studies by Enz (2000) and Ward and Zurbruegg (2002) have shown that countries with a strong Islamic background purchase less insurance which is depicted by the below global average of insurance penetration in countries like United Arab Emirates, Qatar, and Kuwait. With this kind of faith, those who are averse to gambling due to religious beliefs might also be reluctant to demand insurance if they see that relying on insurance is going contrary to their faith (Hussels et al., 2005).

Hammond, Houston, and Melander (1967) also investigated the relationship between life insurance premium expenditures and various demographic characteristics of households as well as marital status and race. They concluded that race mirrored some cultural differences, such as attitudes toward death, family, individualism, and risk aversion. These differences may explain some variation in premium expenditures among households. Using cross-sectional data, Hammond et al. found that marital status was negative and significant but race was not significant in their analysis.

Burnett and Palmer (1984) employed a dollar amount of total individual life insurance including term insurance, whole life assurance and endowment as a dependent variable. Using Multiple Classification Analysis (MCA), three demographic variables were found to be statistically significant in explaining the amount of life insurance. Specifically, number of

children was found to have a positive influence on amount of life insurance and his is expected because households with more children have greater dependency burden. In line with Burnet and Palmer, Showers and Shotick (1994) found a positive relationship between family size and insurance purchased. In contrast, Anderson and Nevin (1975), using the data of consumer decision processes from 1968-1971, contended that household size does not affect demand for life insurance.

In the academic literature, the level of education in a country is used as a proxy for risk aversion (Dragos, 2014). Theoretically, as one progresses through the educational ladder, one becomes a risk lover probably because of a higher level of income associated with higher level of education. This is one reason why people in the informal sector are assumed not to purchase insurance as compared to those in the formal sector. The implication is that, *ceteris paribus*, education measured as years in school or level of education attained is expected to be positively related to the insurance purchased. In spite of this, Feyen, Lester and Rocha. (2011) discovered that schooling does not seem to be an important driver of life insurance. Ofoghi and Farsangi (2013) suggested that the level of risk aversion for individuals with insurance knowledge is higher than the level for those without insurance knowledge. Liebenberg, Carson, and Dumm (2012) concluded that, although the results on the effect of education are mixed, many studies indicate that professional, self-employed and managers have relatively more life insurance holdings. This supports the idea that just the level of education does not determine life insurance demand, but the level of knowledge in insurance education influences demand for life insurance.

## **Methodology**

### *Analytical approach*

This section aims at establishing a theoretical linkage between poverty reduction and its corresponding increase in the demand for insurance. Assume a risk-averse individual who lives in two periods with certainty in period one and hence has a fixed given income ( $M$ ). In the second period, uncertainty exists and therefore the individual has a random income. Assume further that there are only two possible states of nature: (i) a better state in which the individual's income is  $M + \delta$  and (ii) a worse state in which individual income is  $M - \delta$  and the probability ( $\rho$ ) of the worse state happening to be 0.5. Finally, it is assumed that individuals undertake insurance cover ( $\delta$ ) and each individual is characterized by some level of poverty ( $\alpha$ ).

Given these assumptions, the risk averse individual has the following expected utility:

$$\text{Max } EU = U(M - 0.5\alpha + \gamma) + 0.5\{U(M - \delta + \alpha - \gamma) + U(M + \delta - \gamma)\} \quad (1)$$

The risk averse behaviour is captured by the restriction on the utility function,  $U$ , that is, by its strict concavity ( $U' > 0$  and  $U'' < 0$ ). The above objective function can be twice differentiated to prove that an improvement in poverty level will increase demand for insurance. Taking first order condition of equation (1) yield equation (2)

$$\frac{dU}{d\alpha} = (-0.5)U'(M - 0.5\alpha^o + \gamma) + 0.5U'(M - \delta + \alpha^o - \gamma) \quad (2)$$

Taking second differential of  $\alpha$  in equation (2) with respect to  $\gamma$  yield equation (3)

$$\frac{d\alpha}{d\gamma} = (-0.5)U''(M - 0.5\alpha^o + \gamma)\left(-0.5\frac{d\alpha^o}{d\gamma} + 1\right) + 0.5U''(M - \delta + \alpha^o - \gamma)\left(\frac{d\alpha^o}{d\gamma} - 1\right) = 0 \quad (3)$$

Rearranging equation (3) yields equations (4) and (5)

$$(-0.5)U''(M - 0.5\alpha^o + \gamma)\left(-0.5\frac{d\alpha^o}{d\gamma}\right) + (-0.5)U''(M - 0.5\alpha^o + \gamma) + 0.5U''(M - \delta + \alpha^o - \gamma)\frac{d\alpha^o}{d\gamma} - 0.5U''(M - \delta + \alpha^o - \gamma) = 0 \quad (4)$$

$$0.25U''(M - 0.5\alpha^o + \gamma)\frac{d\alpha^o}{d\gamma} + 0.5U''(M - \delta + \alpha^o - \gamma)\frac{d\alpha^o}{d\gamma} = 0.5U''(M - 0.5\alpha^o + \gamma) - 0.5U''(M - \delta + \alpha^o - \gamma) \quad (5)$$

Making  $\frac{d\alpha^o}{d\gamma}$  the subject from equation (5) yields equation (6)

$$\frac{d\alpha^o}{d\gamma} \{0.25U''(M - 0.5\alpha^o + \gamma) + 0.5U''(M - \delta + \alpha^o - \gamma)\} = 0.5U''(M - 0.5\alpha^o + \gamma) - 0.5U''(M - \delta + \alpha^o - \gamma) \quad (6)$$

From equation (6) we demonstrate that improvement in poverty status will increase demand for insurance as follows:

$$\frac{d\alpha^o}{d\gamma} = \frac{0.5U''(M - 0.5\alpha^o + \gamma) + 0.5U''(M - \delta + \alpha^o - \gamma)}{0.25U''(M - 0.5\alpha^o + \gamma) + 0.5U''(M - \delta + \alpha^o - \gamma)} > 0 \quad (6a)$$

$$\text{let } \omega = 0.5U''(M - 0.5\alpha^o + \gamma) + 0.5U''(M - \delta + \alpha^o - \gamma)$$

$$\frac{d\alpha^o}{d\gamma} = \frac{0.5U''(\omega)}{0.25U''(\omega)} > 0 \quad (6b)$$

Intuitively, equation (6b) shows that the link between poverty status and demand for insurance is linear and can be estimated using linear probability model (LPM). Thus, following Lewis (1989) demand for insurance is modelled as:

$$Y_i = \alpha_i + X_i\beta + \mu_i \quad (7)$$

However, in a cross sectional analysis, the reduced form for  $Y$  is expressed as  $Y^* = X'\beta + \mu$ , where  $X$  is a matrix of observable household characteristics such as poverty and employment

statuses, age, marital status, location and educational. The vector of parameter  $\beta$ , is common to all households, and the vector,  $\mu_i$  is an error term that is specific to each household or individual. We can then define the probability of an individual purchasing insurance as:

$$D_i = X' \beta + \mu \geq 0 \quad (8)$$

Where:

$D_i = 1$  if  $X' \beta + \mu \geq 0$  (The household or individual has an insurance policy)

$D_i = 0$  if  $X' \beta + \mu < 0$  (The household or individual has no insurance policy)

The probability that a household has insurance policy, conditional on the variables available,  $X$ , in the cross section, is  $P = F(X' \beta)$ , where  $F(\cdot)$  is assumed to be the logit distribution function and  $X' \beta$  is the reduced form of the insurance demand.

Using the demand for insurance variable to explain the basic ideas underlying the logit model, we specify that  $Y = DI = 1$  means people have insurance, while  $Y = DI = 0$  means people do not have insurance. Using the detailed exposition of the logit model in Gujarati (2004), we proceed by stating the (cumulative) logistic distribution function as follows:

$$P_i = E(Y = 1 | X_i) = \frac{1}{1 + e^{-(\beta_1 + \beta_2 X_i)}} \quad (9)$$

It can be verified that as  $Z_i$  ranges from  $-\infty$  to  $+\infty$ ,  $P_i$  ranges between 0 and 1 and that  $P_i$  is nonlinearly related to  $Z_i$  (that is  $X_i$ ).

### Model Specification

The variables were assessed in terms of what it adds to the prediction of the dependent variable. The independent variables for this study are age and its square, sex, household size (*Hhs*), level of education (*Edu*), religion (*Rel*), marital status (*Mar*), location (*Loc*), Employment status (*Emp*), and poverty (*Pov*). Due to differences that exist in the demand for insurance in the rural and urban areas, separate models were estimated to cater for this heterogeneity. Hence the model was specified as:

Model 1: Ghana (pooled model)

$$Pr (D_i = 1 | X_i)_{Ghana} = \beta_0 + \beta_1 Age_i + \beta_2 Age_i^2 + \beta_3 Sex_i + \beta_4 Hhs_i + \beta_5 edu_i + \beta_6 Rel_i + \beta_7 Mar_i + \beta_8 Loc_i + \beta_9 Emp_i + \beta_{10} Pov_i + \varepsilon_i \quad (10)$$

Model 2: Urban

$$Pr (D_i = 1 | X_i)_{Urban} = \lambda_0 + \lambda_1 Age_i + \lambda_2 Age_i^2 + \lambda_3 Sex_i + \lambda_4 Hhs_i + \lambda_5 edu_i + \lambda_6 Rel_i + \lambda_7 Mar_i + \lambda_8 Emp_i + \lambda_9 Pov_i + \nu_i \quad (11)$$

Model 3: Rural

$$Pr (D_i = 1 | X_i)_{Rural} = \pi_0 + \pi_1 Age_i + \pi_2 Age_i^2 + \pi_3 Sex_i + \pi_4 Hhs_i + \pi_5 edu_i + \pi_6 Rel_i + \pi_7 Mar_i + \pi_8 Emp_i + \pi_9 Pov_i + \varphi_i \quad (12)$$

## Data

The sixth round of the Ghana Living Standards Survey (GLSS-6) was the source of the secondary data for this study. This data has a section on access to financial and insurance services, credits and assets coupled with other sections on household demographic and economic indicators. A combination of these sections is what gave us the variables for this study. Descriptive statistics of the sample and results of the estimated models are published using tables for ease of understanding. Table 1 depicts the sex of insurance owners and their levels of education. Out of the total sample size of 10340, 98 (1%) have had no formal education; 2,817 (27) have been to Kindergarten (KG)/Primary; 4,681 (45%) have been to the JHS/Middle School level, 1,635 (16%) have been educated up to SHS/Secondary/Vocational/Technical/Commercial; 657 (6%) have obtained Training/Post-secondary diploma and the remaining 452 (5%) have also obtained Degree/ Post-graduate. With specific reference to gender, there were 2488 (24%) females and 7852 (76%) males.

**Table 1: Sex and education of respondents**

Sex of Individual	Educational Level of Head						Total
	No Education	KG/primary	JHS/Middle School	SHS/Sec/Voc/Tech/Comm	Training/Post-sec diploma	Degree/Post-graduate	
Female	28	915	1,044	296	160	45	2,488 (24%)
Male	70	1,902	3,637	1,339	497	407	7,852 (76%)
Total	98 (1%)	2,817 (27%)	4,681 (45%)	1,635 (16%)	657 (6%)	452 (5%)	10,340 (100%)

**Source: Computed from GLSS 6, 2012/2013**

Table 2 indicates the various types of short and long term insurance policies purchased by individuals. Out of 3,431 individuals those that owned short term insurance, 904 had had vehicle or motor insurance, 533 had theirs covering funeral; 523 covered their properties; 491 commercial or business insurance; 482 covered their travels while the remaining 498 had other forms of insurance. It can be inferred that the most common short term insurance patronized by Ghanaians is that of motor/vehicle. As regards long term insurance, 4,165 individuals who responded as having this form of insurance, 915 life insurance that was covered by paid premiums, 1014 had retirement annuity insurance, 534 had insured their education; 522 had insurance covering other endowments/investments while the rest (498) had obtained other forms of long term insurance. Again, it can be gleaned that the most common long term insurance owned by Ghanaians is that for retirement annuity/plan.

**Table 2: Short and long term insurance policies**

Type of Insurance Policy	Do you own this policy?		Total
	Yes (%)	No (%)	
<b>Short term insurance policy</b>			
Vehicle/motor	521 (57.63)	383 (42.37)	904
Funeral	84 (15.76)	449 (84.24)	533
Property	61 (11.66)	462 (88.34)	523
Commercial or business	28 (5.7)	463 (94.3)	491
Travel	18 (3.73)	464 (96.27)	482
Other	45 (9.04)	453 (90.96)	498
			<u>3,431</u>
<b>Long term insurance policy</b>			
Life insurance (premium paid)	499 (54.54)	416 (45.46)	915
Life insurance (premium paid)	259 (37.98)	423 (62.02)	682
Retirement annuity/plan	696 (68.64)	318 (31.36)	1,014
Education	81 (15.17)	453 (84.83)	534
Other endowment/investment	65 (12.45)	457 (87.55)	522
Other (any other form of insurance)	43 (8.63)	455 (91.37)	498
			<u>4,165</u>
Total	4,960 (47.79)	5,419 (52.21)	<u><b>10,379</b></u>

**Source: Computed from GLSS 6, 2012/2013**

The chi-square tests in Table 3 indicate that the differences in poverty and employment status significantly influence the demand for insurance. Looking at all the categories for both poverty and employment statuses (using within-group analysis and comparing across), those who did not own insurance were more than those who owned insurance and confirms the relatively low demand for insurance products by Ghanaians. Specifically looking at insurance, at the ownership level, it is less demanded by the poor due to their relatively high opportunity cost, compared to their non-poor counterparts. Regarding employment status, it is seen that being employed increases the demand for insurance but salaried workers demand more insurance than the self-employed, since salaried workers are under obligation to, at least, insure against pension.

**Table 3: Poverty Status by Ownership of Insurance Policy**

<b>Poverty Status (Within-Group)</b>	<b>Do you Own an Insurance Policy?</b>		<b>Total (%)</b>	Pearson $\chi^2$	P>z
	<b>No (%)</b>	<b>Yes (%)</b>			
Not Poor	5795 (66)	2997 (34)	8,792 (100)		
Poor	1295 (84)	253 (16)	1,548 (100)		
<b>Total</b>	<b>7090 (69)</b>	<b>3250 (31)</b>	<b>10,340 (100)</b>	<b><math>\chi^2</math> (1) = 192.3</b>	<b>0.000</b>
<b>Employment Status (Within-Group)</b>					
Unemployed	228 (74)	79 (26)	307 (100)		
Self Employed	4563 (78)	1325 (23)	5,888 (100)		
Salaried	2299 (55)	1846 (45)	4,145 (100)		
<b>Total</b>	<b>7090 (69)</b>	<b>3250 (31)</b>	<b>10,340 (100)</b>	<b><math>\chi^2</math> (2) = 552.7</b>	<b>0.000</b>

Source: Computed from GLSS 6, 2012/2013

### Measurement of Poverty Scores (Consumption poverty)

The poverty indicator used in this study is the consumption poverty derived from the total consumption expenditure per equivalent adult, of the household that he/she comes from, and expressed in constant prices in Greater Accra in January 2013 (to cater for regional differences in cost of living). The consumption expenditure is made up of food and non-food items (including housing). The regional cost of living index is also based on regional monthly food and non-food CPI weighted by region and urban-rural shares. Although the method for constructing household consumption has been consistent over time, from earlier rounds of the GLSS, adjustments were made to the household consumption construction in the GLSS6 based on the following: (1) including the user values of VCD/DVD/mp4 player/iPad, vacuum cleaner, rice cooker, toaster, electric kettle, water heater, tablet PC and mobile phone. (2) Relaxing the cleaning procedure, replacing the values of expenditure items above 5 standard deviations with the mean for that locality (3 standard deviations were used in the previous surveys (Ghana Statistical Service (GSS), 2014).

Based on the above, two nutritionally-based lines were derived. A lower poverty line of 792.05 Ghana cedis (GHC) per adult per year (individuals whose total expenditure fall below this line are considered extremely poor). This line is 27.1 percent of the mean consumption level in 2012/13. The second is the upper poverty line of 1314.00 Ghana cedis per adult per year (individuals consuming above this level can be considered able to purchase enough food to meet their nutritional requirements and their basic non-food needs). This line is 44.9 percent of the mean consumption level in 2012/13 (GSS, 2014).

### Results and Discussion

This section presents and discusses the econometric results of socio-demographic factors that influence demand for insurance in Ghana and displays sub-sampled models for urban and rural areas to cater for differences that exist in demand for insurance in the urban and rural areas.

The odds ratios and marginal effects are presented for all. The model specification test (linktest) has probability values that are 0.000 and 0.111 (for *\_hat* and *\_hatsq*) respectively and this shows that the model is correctly specified<sup>2</sup>. The goodness of fit test (Hosmer–Lemeshaw) also indicates that the model is fit enough to explain the influence of poverty and employment statuses and demographic factors on demand for insurance. Age has a non-linear (curvilinear) relationship with demand for insurance (Table 4). The significance of the Chow test at one percent also indicates that there are significant differences in the parameter estimates in the urban and rural models so we can discuss them.

**Table 4: Determinants of insurance (Logit results for Ghana, urban and rural areas)**

Insurance	Ghana		Urban Model		Rural Model	
	Odds Ratio	Marginal Effects	Odds Ratio	Marginal Effects	Odds Ratio	Marginal Effects
Age	1.062*** (0.013)	0.011*** (0.002)	1.058*** (0.018)	0.012*** (0.004)	1.069*** (0.019)	0.010*** (0.003)
Age Square	1.000*** (0.000)	-0.001*** (0.000)	1.000** (0.000)	-0.001** (0.000)	0.999*** (0.000)	-0.001*** (0.000)
Sex (0=female, 1=male)	0.622*** (0.041)	-0.091*** (0.013)	0.710*** (0.058)	-0.073*** (0.018)	0.524*** (0.058)	-0.108*** (0.020)
Household size	1.011 (0.011)	0.002 (0.002)	1.007 (0.016)	0.001 (0.003)	1.019 (0.016)	0.003 (0.002)
<b>Education (Base=No Education)</b>						
KG/primary	0.842 (0.207)	-0.031 (0.046)	0.647 (0.200)	-0.096 (0.071)	1.569 (0.787)	0.055 (0.053)
JHS/Middle School	1.007 (0.246)	0.001 (0.046)	0.757 (0.230)	-0.063 (0.070)	1.869 (0.936)	0.081 (0.053)
SHS/Sec/Voc/Tech/Comm	1.346 (0.335)	0.059 (0.047)	0.940 (0.290)	-0.014 (0.072)	2.910** (1.481)	0.158*** (0.056)
Training/Post-sec diploma	3.865*** (0.997)	0.298*** (0.050)	2.557*** (0.816)	0.222*** (0.074)	8.984*** (4.692)	0.407*** (0.064)
Degree/Post-graduate	5.056*** (1.359)	0.357*** (0.052)	3.425*** (1.117)	0.285*** (0.075)	14.894*** (8.523)	0.521*** (0.080)
<b>Religion (Base=No religion)</b>						
Christian	1.309** (0.141)	0.048*** (0.019)	1.330* (0.220)	0.059* (0.033)	1.280* (0.184)	0.036* (0.020)
Islam	1.237* (0.150)	0.038* (0.021)	1.270 (0.228)	0.049 (0.037)	1.152 (0.195)	0.020 (0.024)
<b>Marital Status (Base=Never Married)</b>						
Married	1.221** (0.105)	0.038** (0.016)	1.231* (0.131)	0.045** (0.023)	1.153 (0.172)	0.023 (0.023)
Consensual union	0.967 (0.099)	-0.006 (0.019)	1.019 (0.133)	0.004 (0.028)	0.874 (0.148)	-0.020 (0.025)

<sup>2</sup> According to Wooldridge (2015) the *\_hat* must be significant and *\_hatsq* must not be significant to indicate a correctly specified model.

Table 4. (Continued)

Separated	0.639*** (0.092)	-0.075*** (0.023)	0.696** (0.119)	-0.074** (0.034)	0.500** (0.136)	-0.089*** (0.032)
Divorced	0.822 (0.102)	-0.035 (0.022)	0.899 (0.137)	-0.022 (0.032)	0.662* (0.143)	-0.057* (0.029)
Widowed	0.780* (0.103)	-0.043* (0.023)	0.704** (0.117)	-0.071** (0.033)	0.821 (0.177)	-0.029 (0.031)
Location (0=urban, 1=rural)	0.693*** (0.036)	-0.068*** (0.009)	— —	— —	— —	— —
<b>Employment Status (Base=Unemployed)</b>						
Self Employed	0.736** (0.109)	-0.057** (0.029)	0.763 (0.149)	-0.058 (0.043)	0.756 (0.171)	-0.043 (0.037)
Salaried	1.364** (0.202)	0.063** (0.029)	1.186 (0.229)	0.038 (0.042)	1.790** (0.417)	0.108*** (0.039)
Poor	0.570*** (0.046)	-0.104*** (0.015)	0.498*** (0.076)	-0.149*** (0.032)	0.617*** (0.059)	-0.074*** (0.015)
Constant	0.136*** (0.052)		0.131*** (0.066)		0.032*** (0.021)	
N	10,328		5,353		4,975	
Pseudo R2	0.1120					
Hosmer–Lemeshaw	P> $\chi^2$ =0.417		P> $\chi^2$ =0.417		P> $\chi^2$ =0.787	
Linktest	_hat: P> z = 0.000		_hatsq: P> z = 0.111			
Chow test [LR chi2(19)]	45.72					
P-Value	0.001					

Robust Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Source: Authors' computation using GLSS6 data.**

Table 4 shows that age, age square, sex, higher education, religion, marital status, location, employment and poverty status significantly influence demand for insurance, with slight differences for in the case of rural and urban areas. At youthful ages, an additional year increases the probability of demanding insurance by 1.1 percent while in later years (old age) the probability of demanding insurance diminishes, although marginally. The positive relationship supports the findings of Baek and De Vaney (2005) while the negative relationship experienced in old age also supports the findings of Chen, Wong & Lee (2001) and Lin and Grace (2007). It seeks to reason that young people see the need to insure against unforeseen future occurrences while older folks do not so see the need to do so once they have already aged and this is consistent with the Life-Cycle Hypothesis (LCH).

In general males are about nine percent less likely to purchase insurance as compared to their female counterparts. Stated differently, females are more likely to demand insurance compared to males because they are more risk-averse than males (Faff, Mulino & Chai, 2008). In the African context in general and in the Ghanaian context, in particular, it seems men are prepared to take risk in comparison with women and may explain why they are less likely to

purchase insurance of any kind. Again, in most Ghanaian culture men seem to be selfish in that they might not want to leave a bequest. If life insurance policy for example is considered as a benefit that goes to a bereaved family then since men are perceived to die early leaving their wives behind might not motivate them to purchase life insurance policy,

Lower levels of education do not significantly influence the demand for insurance while higher levels have been found to influence the demand for insurance. Compared to people with no education, those who have been educated up to the Training/Post-Sec, Diploma and Degree/Post-graduate levels have high probability of demanding insurance that are, respectively, 0.297 percent and 0.358 percent higher. This finding is consistent with the work by Gandolfi and Miners (1996) who posited that with males have a higher demand for insurance policy.

Compared to those with no religious affiliation, both Christians and those of the Islam faith all have probabilities of demanding insurance that are 4.9 percent and 3.8 percent respectively more. Specifically, Christians have higher probability of demanding insurance compared to their Islamic counterparts. The case of religion is particularly not surprising as it corroborates the findings of Browne and Kim (1993) that religious affiliation is significant in explaining the demand for insurance.

Similarly, marital status significantly influences the demand for insurance. Using the category of the never married as the base, it is only being married that has the tendency of increasing the probability of demanding insurance more than being married. The difference in tendency is 3.6%. Besides being married the tendency of demanding insurance for the separated and widowed are all lower than those who have never married. This means that getting married heightens the consciousness of individuals to insure against future occurrences since the interest of third parties (wife and, possibly, children) are at stake.

Compared to the unemployed (for employment status), the salaried workers have probabilities of demanding insurance that are 6.4 percent more than the self-employed who have probabilities of demanding insurance that are 5.7 percent more. Matching the salaried workers against the self-employed, the salaried workers also can be seen as demanding more than the self-employed. This is likely to be a consequence of compliance than willingness to pay since the salaried worker is, by legislation, mandated to insure against retirement while the self-employed is only expected to do same out of will. In another instance, demand for insurance can differ depending on residential area. Rural folks' probability of demand for insurance is 6.7 percent less compared to their urban counterparts in the cities and metropolitan areas. This can be attributed to differences in poverty levels in these areas since poverty status has been found to have a significant influence on demand for insurance. Poor people are 10 percent less likely to demand insurance products as compared to the non-poor maybe because they feel they have few resources to insure against than losing them.

In terms of rural-urban comparisons, age influences urban dwellers to demand insurance more than it does for those located in the rural areas. As regards the gender difference and its link to location, males lower probabilities for insurance demand in both rural and urban areas compared to females but males' lower demand for insurance is more pervasive in the urban areas

than it is the rural areas. What was striking about religion (Christian and Islamic) was that the variable is strong in predicting demand for insurance at the national level but loses its predictive power when seeking the locational effect. With respect to the married and their demand for insurance, we found the outcome to be an urban phenomenon and not a rural one. Although we found salaried workers to have a higher probability for insurance demand than the self-employed, the demand is driven by salaried workers in the rural areas and not those in the urban communities. Finally, Although the probability of demand for insurance for the poor is lower, the poor person in the rural area has a higher likelihood of demand than the poor in the urban area.

## **Conclusions**

This study analysed the socio-demographic factors that influence demand for insurance in Ghana. Findings from the study show that age of an individual has a non-linear relationship with demand for insurance which means that people demand more insurance when they are young and demand less insurance when they are ageing. Females are more likely to demand insurance compared to their male counterparts and this could be explained from females' risk-aversion point of view. With respect to education, people with higher levels of education have higher demand for insurance compared to their counterparts with lower levels of education.

Again, the higher a person's educational level, the more likely an individual will purchase insurance since higher levels of education equips the person with more knowledge on insurance, how it works and its benefits. The religious angle also shows that Christians have a higher demand for insurance than their counterparts with Islamic background and those who have no religious affiliation. Rural residents have also been found to demand less insurance compared to those in the urban areas maybe because urban residents are faced with many risks compared with rural residents. Married persons have also been found to demand insurance more than the unmarried, separated and the widowed since they have the interest of other parties (wife and possible children) at hand and must ensure that they have a secure future. Another revelation was that salaried workers demand more insurance than the self-employed and is likely to be explained as resulting from compliance than willingness to pay.

The rural-urban analysis showed that age has a greater influence on urban dwellers' probability of demand for insurance than it is for their rural counterparts. For gender, males' lesser probability for the demand for insurance is more pervasive in the urban areas than the rural situation. In terms of religion, it was found to have a predictive power in influencing the demand for insurance at the national level but was not so in the rural and urban models. Although salaried workers were found to have a higher probability of demanding insurance than the self-employed, the outcome was largely driven by the salaried workers in the rural areas and not the urban-located ones. Finally, the poor person in the rural area has a higher likelihood of demand for insurance than the poor in the urban area.

## Limitations

The study did not consider any institutional variable in the estimation due to data constraint. In addition, the empirical literature for the study was written using life insurance which should not have been the case. The religion variable did not include traditional believers because the module, after merging with other files, only had one traditional person reporting for ownership of insurance. This is what made us exclude the traditional category from the religion variable.

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## Appendix

### Descriptive statistics of variables used in estimating the Determinants of Insurance

Variable	Obs (N)	Mean	Std. Dev.	Min	Max
Insurance	10340	0.31431	0.46426	0	1
Age	10340	41.6914	12.8862	15	99
Age Square	10340	1904.21	1189.2	225	9801
Gender (0=female, 1=male)	10340	0.75938	0.42748	0	1
Household size	10340	3.97108	2.47139	1	29
<b>Education (Base=No Education)</b>					
KG/primary	10340	0.27244	0.44524	0	1
JHS/Middle School	10340	0.45271	0.49778	0	1
SHS/Sec/Voc/Tech/Comm	10340	0.15812	0.36487	0	1
Training/Post-sec diploma	10340	0.06354	0.24394	0	1
Degree/Post-graduate	10340	0.04371	0.20447	0	1
<b>Religion (Base=No religion)</b>					
Christian	10340	0.78221	0.41277	0	1
Islam	10340	0.15503	0.36195	0	1
Other	10340	0.00126	0.03544	0	1
<b>Marital Status (Base=Never Married)</b>					
Married	10340	0.58511	0.49273	0	1
Consensual Union	10340	0.10996	0.31286	0	1
Separated	10340	0.04255	0.20186	0	1
Divorced	10340	0.06809	0.2519	0	1
Widowed	10340	0.06267	0.24238	0	1
Location (0=urban, 1=rural)	10340	0.48143	0.49968	0	1

**Employment Status (Base=Unemployed)**

Self Employed	10340	0.56944	0.49518	0	1
Salaried	10340	0.40087	0.4901	0	1
Poverty Status (0=Not poor, 1=Poor)	10340	0.14971	0.3568	0	1

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