Gender perspective on life insurance demand in Ghana

Samuel Ampaw, Edward Nketiah-Amponsah and Nkechi Srodah Owoo
Department of Economics, University of Ghana, Accra, Ghana

Received 16 May 2017
Revised 20 November 2017
22 January 2018
Accepted 12 April 2018

Abstract

Purpose – Against the background that Ghanaians seldom purchase insurance policies, the purpose of this paper is to investigate the determinants of life insurance uptake among male and female household heads in Ghana.
Design/methodology/approach – The study employs data on 775 male and 233 female household heads from the sixth round of the Ghana Living Standards Survey. Adjusted Wald test statistics and logistic regressions are employed for the empirical estimations.
Findings – Results from the adjusted Wald test show that the sampled male household heads significantly differ from their female counterparts in terms of the selected socioeconomic and demographic characteristics. Though ill health status, higher wealth, being self-employed or in wage or salaried employment and residing in either of the three northern regions (upper east, upper west and northern regions) in Ghana broadly affect the demand for life insurance among both male and female heads, other factors are peculiar to either parties. Particularly, whereas female heads who are married and those with more dependants have a higher propensity of purchasing life insurance policies, their male counterparts with higher education are more likely to buy life insurance policies.
Research limitations/implications – The paper adds to the paucity of cross-sectional studies on life insurance demand in Africa.
Practical implications – Based on the explored determinants, insurers could better regulate the purchase of their products by taking into consideration the gender differences to maximize their sales and enhance economic growth and development.
Originality/value – This paper explores the gender dynamics in the determinants of life insurance demand in a developing country, Ghana. Besides, findings from related literature are reported to be mixed. Though the current paper is not wholly nationally representative, it utilizes data from across all the ten administrative regions of Ghana. To the best of the authors' knowledge, no prior study has been conducted in this manner.

Keywords Ghana, Life insurance demand, Male/female household head

Paper type Research paper

1. Introduction

The growth of insurance in Africa is generally low and declining. Compared to the average global rate of 6.5 percent, Alhassan and Biekpe (2016) posit that Africa's insurance penetration rate of 3.65 percent in 2012 is lower. Also, Swiss Re Sigma Report (2016) discloses a reduction in Africa's insurance penetration rate from 3.65 percent in 2012 to 2.9 percent in 2015. In Ghana, the purchase of insurance policies is reported to be unencouraging (see *inter alia*, National Insurance Commission, 2013; Boadu *et al.*, 2014; Abaidoo and Nwosu, 2016). Resultantly, insurance penetration[1] in the country (Ghana) remained less than 2 percent from 2010 to 2013 (National Insurance Commission, 2013). In comparison with Africa's average rate of 3.5 percent in 2013 (Swiss Re Sigma Report, 2014), Ghana's insurance penetration rate remains low. This phenomenon threatens the existence of the insurance industry in Ghana, and thus, requires imperative measures to salvage the situation.

Africa's microinsurance is dominated by life insurance (Matul *et al.*, 2010). Accordingly, life insurance premiums in Ghana contribute more to total insurance premiums than non-life insurance premiums (National Insurance Commission, 2013). Apart from the

The authors have not made their research data set openly available. Any enquiries regarding the data set can be directed to the corresponding author.

International Journal of Social Economics
Vol. 45 No. 12, 2018
pp. 1631-1646

0306-8293
DOI 10.1108/IJSE-03-2017-0120

aforementioned, increased participation in life insurance will positively impact the country's economic growth and development (Ghosh, 2013; Abaidoo and Nwosu, 2016; Alhassan and Biekpe, 2016; Kaushal and Ghosh, 2017). Life insurance policies are long-term financial investment products. Individuals purchase life insurance products with risk management and or saving mobilization motives (Beck and Webb, 2003; Mahdzan and Victorian, 2013). According to Loke and Goh (2012), uptake of life insurance is a rational economic decision; as the decision to purchase a policy is often made in the state of risk and uncertainty. Addressing the factors impeding the uptake of life insurance will therefore improve the country's insurance industry at large.

Several empirical studies have examined the determinants of life insurance in both developed and developing countries (see *inter alia*, Beck and Webb, 2003; Giesbert, 2010, 2012; Sarkodie and Yusif, 2015; Guerineau and Sawadogo, 2015; Sulaiman *et al.*, 2015). However, as indicated by Guerineau and Sawadogo (2015), majority of the existing papers obtained evidence from developed and emerging economies. This makes the current paper relevant which seeks evidence from Ghana, a developing country. Though the determinants of life insurance demand vary by gender (Gandolfi and Miners, 1996), the gender dynamics, especially in developing countries, is largely ignored in the literature. Moreover, more men than women are reported in existing literature to be life insured (see *inter alia*, Giesbert, 2010, 2012; Sarkodie and Yusif, 2015; Luciano *et al.*, 2015). According to Bortei-Doku and Aryeetey (1995) and Ankomah (1996), this could result from the fact that females in most developing countries, Ghana inclusive, are often excluded from accessing formal financial services and hence resort to informal strategies of managing risks and uncertainties (Giesbert, 2010, 2012). Explaining why women are less likely than men to purchase life insurance policies, Luciano *et al.* (2015) suggest that because women do not attach monetary value to their roles in the family, they do not monetize the risks associated with their demise. From the above-mentioned, policies based on studies which fail to account for the probable gender disparities in the determinants of life insurance demand in such developing countries may be misleading. The purpose of this paper is to: provide some gender inquiry into the predictors of life insurance demand in developing countries by focusing on male and female household heads in Ghana; add to the dearth of available cross-sectional studies on the predictors of life insurance uptake in Africa and provide empirical evidence on life insurance demand to advance Ghana's (life) insurance industry.

The rest of the paper is organized as follows. In Section 2, the paper discusses some theoretical and empirical literature relating to life insurance demand. Section 3 presents the empirical method for analyzing the data. It also discusses the data source, as well as its measurement and description. Also, the empirical model adopted by the study is presented in this section. In Section 4, our empirical results are presented and discussed. Finally, Section 5 concludes the study with a summary of the relevant findings and implications.

2. Related theoretical and empirical literature

2.1 Theoretical literature relating to life insurance demand

The expected utility theory (EUT) by von Neumann and Morgenstern (1944) posits that in the face of risk and uncertainty, a rational decision maker will always opt for the alternative which maximizes expected utility (Mongin, 1998). According to Giesbert (2012), the EUT and the concept of risk aversion are regarded as the primary models for analyzing risk and insurance demand. Schlag (2003) adds that theories relating to life insurance demand stem from consumption theories. Furthermore, Mishra (2014) postulates that theoretical models underpinning the demand for life insurance suggest that life insurance enables households to minimize the loss of income associated with the passing on of the breadwinner.

It is evident from the literature that Yaari (1965) pioneered the formal development of a theoretical framework which analyzes the demand for life insurance (see *inter alia*, Lewis, 1989; Beck and Webb, 2003; Chen *et al.*, 2006; Mahdzan and Victorian, 2013; Mishra, 2014). Yaari's (1965) framework ascribes the motivation to secure a life insurance policy to the desire to protect dependants against possible financial catastrophe due to the loss of income resulting from death or retirement. It hypothesizes that life insurance demand is dependent on wealth, lifetime expected income, interest rates, administrative costs of policy and discount on current over future consumption (Mahdzan and Victorian, 2013). In the formulation of Yaari's (1965) model, lifetime uncertainty played a major role. He reveals that individuals will be driven by the yearning to bequeath sufficient income to their dependants to purchase life insurance policies because they are uncertain about when they will die.

Fischer (1973) utilized a discrete time model to observe "life-cycle patterns of consumption, savings and insurance purchase." According to Eck and Nizovtsev (2006), Fischer's specification of the demand for life insurance is defined by the expected utility function of an individual. This is shown as follows:

$$E\left[\sum_{t=1}^{T}\left(\pi_t^{\alpha}\frac{C_t^{1-\beta}}{(1-\beta)}\frac{1}{(1+\rho)^{t-1}}+\pi_{t+1}^{d}b_{t+1}\frac{G_{t+1}^{1-\beta}}{(1-\beta)}\right)\right], \tag{1}$$

where T is the individual's maximum lifetime, π_t^{α} the probability of living in period t, π_t^{d} measures the probability of death at the beginning of period t, C_t represents consumption in period t, G_t measures bequest in period t, β the parameter determining the specific form of utility function, ρ the discounting factor and b_t the weight on bequest in period t.

Eck and Nizovtsev (2006) disclose that at any time t, the individual derives satisfaction from consumption (C_t) while alive, and if death occurs, utility is attached to bequest (G_t). Similar to Yaari (1965), Fischer (1973) proposes that in equilibrium, the marginal utility derived from consumption must be equal to the marginal utility derived from bequest at any time period. Eck and Nizovtsev (2006) report that the specified utility function allows for discussions on the effect of socioeconomic and demographic (SED) factors on life insurance demand.

Lewis (1989) presents an extension of Yaari's theory to include the optimization of the expected utility of dependants. The paper postulates that life insurance is determined by the demographic composition of the breadwinner's household. Hence, the decision to purchase life insurance is tied to the utility of dependants, constrained by the breadwinner's lifetime income. Lewis (1989) reports the resulting optimization problem facing the dependant as follows:

$$\max_{d_i} EU_i = (1-p_i)\times\left[u_i(t_i-d_i)+EU_{i+1}+p_iU_i(f_i+b_i-d_i)\right], \tag{2}$$

where EU_i is the expected utility from ages i to a, p_i the probability that husband dies at dependant's age i, $u_i(.)$ the instant satisfaction at age i and $U_i(.)$ is the derivable satisfaction from age i to a at maximum consumption.

Here, the offspring's decision to purchase a life insurance policy is subject to uncertainties associated with the breadwinner's income stream. Furthermore, the child is expected to remain in the household until he is a year. Until after age a, the child receives money annually as long as the breadwinner survives. Upon the death of the breadwinner, his dependant receives a known sum assured at the expense of further transfers (t_i). This model does not permit the offspring to borrow against anticipated income. The model's objective is for each child to maximize his expected utility subject to his spending on life insurance (d_i). Where the breadwinner stays alive, his dependant spends $t_i - d_i$. However, should the breadwinner die, his dependant collects $f_i + b_i - t_i$; where f_i and b_i represent the

insurance policy's face value, and bequest, respectively. As indicated by Schlag (2003), Lewis (1989) defines life insurance demand as a function of numerous explanatory variables. This is shown as follows:

$$Z = f[(+)p, (+)c, (+)r, (-)w, (-)L], \tag{3}$$

where Z is the life insurance demand, p the probability of death of the breadwinner, c the present value of beneficiaries' total consumption, r the relative risk aversion of beneficiaries, w the net wealth of the household and L is the "price of insurance as the ratio between the cost and the actuarial value of the insurance." The aforementioned determinants are operationalized in empirical works by use of proxy variables (Schlag, 2003).

In conclusion, the evidence provided shows that, in addition to the premium payable to secure a life insurance policy, the demand for life insurance is affected by SED characteristics of households and individuals.

2.2 Brief empirical survey on life insurance demand

Life insurance penetration and life insurance density have been widely used in the literature to model the demand for life insurance policies (see *inter alia*, Beck and Webb, 2003; Çelik and Kayali, 2009; Guerineau and Sawadogo, 2015; Sulaiman *et al.*, 2015; Emamgholipour *et al.*, 2017). In addition to the two above-mentioned proxies, Beck and Webb (2003) utilized "life insurance in force" to GDP to examine the demand for life insurance. Most of the available studies on the determinants of life insurance uptake are focused on developed and emerging economies. For instance, in the study by Beck and Webb (2003), but for Cameroon, Egypt, Kenya, South Africa, Zambia and Zimbabwe, the paper chiefly studied non-African countries. Similarly, Çelik and Kayali (2009) explored the determinants of life insurance uptake employing data from 31 European countries. Nonetheless, studies on life insurance demand in African countries are increasing in recent times (see *inter alia*, Giesbert, 2010, 2012; Sulaiman *et al.*, 2015; Guerineau and Sawadogo, 2015; Sarkodie and Yusif, 2015).

Beck and Webb (2003) posited that the determinants of life insurance consumption vary widely across countries. This necessitates country-specific studies on life insurance demand. Beck and Webb (2003) found that income and the share of younger population positively and significantly affect life insurance demand using life insurance penetration and life insurance density as proxies. However, utilizing the life insurance in force to GDP proxy, these two factors were found to be "irrelevant" determinants of life insurance. Based on evidence from all three indicators of life insurance demand, Beck and Webb (2003) further reported that inflation rate, education and banking sector development are useful in explaining life insurance demand. Beck and Webb (2003) employed cross-sectional techniques on data from 63 countries, as well as panel analytical techniques on 23 countries. Çelik and Kayali (2009) contradicted the finding of Beck and Webb (2003) regarding the effect of education on life insurance consumption. Whereas Beck and Webb (2003) found that education positively relates to life insurance demand, Çelik and Kayali (2009) found that higher education discourages the uptake of life insurance policies. On the other hand, Çelik and Kayali's (2009) results for the effect of inflation and population on life insurance demand are similar to that of Beck and Webb (2003). Both studies found that inflation (population) is inversely (positively) associated with life insurance demand.

Like Beck and Webb (2003), Guerineau and Sawadogo (2015) submitted that income positively influences life insurance density in Sub-Saharan Africa. However, contrasting Beck and Webb (2003), Guerineau and Sawadogo (2015) found that the young dependency ratio negatively affects life insurance demand in Sub-Saharan Africa. Life expectancy and inflation rates were also found to negatively influence life insurance consumption by Guerineau and Sawadogo (2015). Both studies by Guerineau and Sawadogo (2015) and

Sulaiman *et al.* (2015) showed that the old dependency ratio, protection of property rights and government stability positively affect life insurance consumption in Africa.

The decision to purchase or not to purchase a life insurance policy has been used by few cross-sectional studies to proxy life insurance demand. Among such studies are Giesbert (2010, 2012), Loke and Goh (2012), Annamalah (2013) and Sarkodie and Yusif (2015). Loke and Goh (2012) used a hurdle count-data model to examine the determinants of life insurance consumption among Malaysians. The paper further analyzed the determinants of the quantity of life insurance policies acquired. Of 17 variables used, age groups, risk aversion, ethnicity, income, education, occupation and marital status were found to be important predictors of life insurance in Malaysia. Also, in studying the SED determinants of life insurance demand among married couples in Malaysia using logit regression model, Annamalah (2013) found that marital status, age, education, ethnicity and household income are among the important predictors of life insurance demand.

Based on the Survey on Income and Households collected by the Bank of Italy in 2012, Luciano *et al.* (2015) examined the gender issues in life insurance demand among Italian households. They find that relative to men, Italian women are less likely to own life insurance policies. In addition, they establish that the demand for life insurance in Italy is highly associated with income, family structure, employment status, geographical variables, home and stock portfolio.

For Ghana, Giesbert (2010, 2012) found that risk aversion, risk probability, initial wealth and intensity of bequests are important predictors of life insurance uptake in Southern Ghana and rural Ghana, respectively. Both studies used probit models to analyze the data collected in 2009. Sarkodie and Yusif (2015) provided further evidence on life insurance demand in Ghana. This study adopted logit regression technique to model the data collected on 256 individuals from Ayeduase-Kumasi Community in Ghana. They find that age, income, education, number of dependants, employment type and perception about insurers are important determinants of life insurance uptake in Ghana.

In conclusion, the literature about the gender dynamics in the determinants of life insurance consumption in Ghana is gray. Hence, the current paper seeks to bridge this gap. It will therefore add to the paucity of cross-sectional studies on life insurance demand in Africa. In addition, the study is necessitated by the fact that the findings from existing literature are mixed according to Zietz (2003), Annamalah (2013) and Redzuan (2014).

3. Methodology

3.1 Data

The paper utilized cross-sectional data from the sixth round of the Ghana Living Standards Survey (GLSS 6). This survey was conducted in 2012/2013. Since 1987/1988, the Ghana Statistical Service, with support from the World Bank, has conducted six rounds of the Ghana Living Standards Survey (GLSS). These surveys were conducted in 1987/1988, 1988/1989, 1991/1992, 1998/1999, 2005/2006 and 2012/2013. The GLSS follows a two-stage sampling method. The initial stage involves the random selection of enumeration areas by means of probabilities which are proportional to the size of the population. The second stage comprises the systematic selection of households based on the primary sampling units (Ghana Statistical Service, 2014).

Though a nationally representative sample of 18,000 households in 1,200 enumeration areas was selected, 16,772 households were successfully interviewed (Ghana Statistical Service, 2014). This yields a response rate of 93.2 percent. Of the total number of successfully interviewed respondents[2], 3.17 percent[3] reported owning a life insurance policy, while 2.84 percent[4] indicated that they did not own any life insurance policy. Most of the respondents, 93.98 percent[5], had missing observations for the question about their ownership, or otherwise, of a life insurance policy. This restricts the representativeness

of the study, although samples from all the ten administrative regions of Ghana are used in the study. In all, the paper used data on 1,008[6] households, of which 775 are male-headed and 233 are female-headed.

The GLSS 6 collected information on the SED characteristics of households and individuals. Description and measurement of the variables employed are shown in Table I. In all, while 11 explanatory variables were adopted for the full sample, 10 were used for the subsamples. These variables, used to explore the SED determinants of life insurance demand in Ghana, were chosen with recourse to the theoretical and empirical literature.

3.2 Empirical method of analysis

From the GLSS 6, the paper used the question as to whether the individual has or does not have a life insurance policy as its dependent variable. Respondents (household heads) answered either yes or no to this question. In our empirical analysis of this binary dependent variable, the yes responses were coded 1, while the no responses were coded 0.

This section of the paper draws substantially from Dougherty (2007). Suppose the dependent variable is denoted as Y_i, such that Y_i equals the expected value of Y_i given x_i, $E(Y_i|x)$ and the stochastic term, μ_i. Hence:

$$Y_i = E(Y_i|x) + \mu_i. \tag{4}$$

Note that the expected value of Y_i given x_i, $E(Y_i|x)$, represents βx_i. The linear probability model (LPM) is then defined as follows:

$$p_i = p(Y_i = 1) = \beta x_i, \tag{5}$$

where p is the probability that a household head owns a life insurance policy; X the vector of SED characteristics of the household head and β is the vector of coefficients of the SED characteristics.

The logit and probit models are known to address these identified flaws of the LPM. First, both models (logit and probit) use the maximum likelihood estimation (MLE) to account for the initial problem of the LPM. Its (LPM) second problem is addressed by defining a variable Z which is a linear function of the independent variables, that is, $Z = \beta x_i$.

Variable	Description
Life insured	Life insurance ownership: 1 = head has life insurance policy; otherwise = 0
Age	Age of household head (years)
Age^2	Age of household head square
Dependants	Number of dependants (household members under 18 years and over 64 years)
Dependants^2	Number of dependants square
North	Region of residence: 1 = north (resident in upper east/upper west/northern regions); 0 = south
Ill health status	Health status of respondent: 1 = ill/injured in last 2 weeks; otherwise = 0
Male	Gender of respondent: 1 = male; female = 0
Employment	Employment type: 1 = other (comprising domestic employment/family employment/ apprenticeship)[a]; 2 = self-employment; 3 = wage/salaried employment
Education	Educational attainment of respondent: 1 = no formal education; 2 = basic; 3 = at least secondary[a]
Marital status	Marital status of respondent: 1 = never married[a]; 2 = married; 3 = ever married
Wealth quintile	Measure of wealth status of household: 1 = lowest; 2 = lower; 3 = middle; 4 = higher; 5 = highest[a]
Urban	Place of residence: 1 = urban; 0 = rural
Income	Log of total household income (Ghana cedis)
Income^2	Log of total household income square

Note: [a]Indicates reference category

Table I.
Description and measurements of variables

The choice of the logistic function (used in logit estimation) over the cumulative normal distribution (used in probit estimation) is not based on any peculiar advantage the former has over the latter. This is because econometrics literature shows that both methods yield satisfactory results. Following Dougherty (2007), the paper further assumes that the probability that a household head owns a life insurance policy, p_i, is a sigmoid/S-shaped function of Z. The resulting logit model is denoted as follows:

$$p_i = F(Z_i) = \frac{1}{1+e^{-Z_i}}. \tag{6}$$

The marginal effects were computed to determine the change in the probability that a household head will purchase a life insurance policy. This is obtained as the product of the derivative of p_i with respect to Z, $f(Z)$, and the parameter estimates from the logit model, β. This results in the following subsequent equation:

$$\frac{dp}{dZ} = f(Z)\beta = \frac{e^{-Z}}{(1+e^{-Z})^2}\beta. \tag{7}$$

The empirical models used by the study to investigate the predictors of life insurance demand among male and female household heads in Ghana are specified in the following equations. Specifically, we explored the effects of both wealth and income for robustness check[7]:

$$\begin{aligned} \textit{Specification A}: \text{Life}_{ij} = {} & \beta_0 + \beta_1 \text{Age}_{ij} + \beta_2 \text{Age squared}_{ij} + \beta_3 \text{Dependant}_{ij} \\ & + \beta_4 \text{Dependant squared}_{ij} + \beta_5 \text{North}_{ij} + \beta_6 \text{Ill health}_{ij} \\ & + \beta_7 \text{Male}_{ij} + \beta_8 \text{Employment type}_{ij} + \beta_9 \text{Education}_{ij} \\ & + \beta_{10} \text{Marital status}_{ij} + \beta_{11} \text{Urban}_{ij} + \beta_{12} \text{Wealth quintile}_{ij} + \varepsilon_{ij}. \end{aligned} \tag{8}$$

$$\begin{aligned} \textit{Specijfijcatijon B}: \text{Life}_{ij} = {} & \beta_0 + \beta_1 \text{Age}_{ij} + \beta_2 \text{Age squared}_{ij} + \beta_3 \text{Dependant}_{ij} \\ & + \beta_4 \text{Dependant squared}_{ij} + \beta_5 \text{North}_{ij} + \beta_6 \text{Ill health}_{ij} \\ & + \beta_7 \text{Male}_{ij} + \beta_8 \text{Employment type}_{ij} + \beta_9 \text{Education}_{ij} \\ & + \beta_{10} \text{Marital status}_{ij} + \beta_{11} \text{Urban}_{ij} + \beta_{12} \text{Income}_{ij} + \varepsilon_{ij}. \end{aligned} \tag{9}$$

Taking the survey design into consideration, the above model specifications were estimated by means of the MLE technique in STATA 13.0.

4. Results

4.1 Descriptive statistics

Table II presents descriptive statistics of the explanatory variables by life insurance ownership disclosure status. Since almost 94 percent of the interviewees failed to provide information about their life insurance ownership, this subsection is aimed at exploring the characteristics of the persons who failed to reveal their life insurance ownership statuses, and as well ascribe possible reasons for their actions. This is relevant in understanding the people included in the analysis.

Generally, the study finds that persons who failed to give information about their life insurance ownership are mainly those with either basic or no formal education; those who have ever been married (divorced, separated or widowed); those who are self-employed; those who are members of less wealthy households; and those who reside in the upper east, upper west or northern regions of Ghana. Being the regions with the most deprived persons,

Variables	Full subsample Did	Full subsample Did not	Mean Difference	Male subsample Did	Male subsample Did not	Mean Difference	Female subsample Did	Female subsample Did not	Mean Difference
Age	44.48	45.09	−0.61 (0.33)	44.28	43.74	0.54 (0.40)	45.20	48.08	−2.88 (0.05)
Dependants	1.97	2.11	−0.14 (0.30)	2.12	2.25	−0.13 (0.42)	1.45	1.80	−0.35 (0.01)
Ill health status	0.16	0.18	−0.02 (0.16)	0.15	0.15	0.00 (0.83)	0.21	0.26	−0.05 (0.11)
Male	0.78	0.69	0.09 (0.00)						
North	0.08	0.13	−0.05 (0.00)	0.08	0.16	−0.08 (0.00)	0.10	0.07	0.03 (0.47)
Urban	0.71	0.54	0.17 (0.00)	0.71	0.51	0.20 (0.00)	0.71	0.62	0.09 (0.08)
Income	8.68	8.07	0.61 (0.00)	8.85	8.26	0.59 (0.00)	8.09	7.64	0.45 (0.01)
Employment type									
Other	0.06	0.07	−0.01 (0.36)	0.04	0.05	−0.01 (0.41)	0.11	0.11	0.00 (0.82)
Wage/salaried	0.60	0.26	0.34 (0.00)	0.65	0.32	0.33 (0.00)	0.39	0.13	0.26 (0.00)
Self-employed	0.35	0.67	−0.32 (0.00)	0.30	0.63	−0.33 (0.00)	0.50	0.76	−0.26 (0.00)
Educational attainment									
No education	0.10	0.34	−0.24 (0.00)	0.06	0.30	−0.24 (0.00)	0.23	0.44	−0.21 (0.00)
Basic	0.33	0.47	−0.14 (0.00)	0.33	0.49	−0.16 (0.00)	0.32	0.43	−0.11 (0.02)
At least sec.	0.57	0.19	0.38 (0.00)	0.60	0.21	0.39 (0.00)	0.45	0.13	0.32 (0.00)
Marital status									
Never married	0.14	0.12	0.02 (0.13)	0.13	0.12	0.01 (0.64)	0.19	0.12	0.07 (0.03)
Married	0.72	0.64	0.08 (0.00)	0.82	0.80	0.02 (0.59)	0.36	0.28	0.08 (0.02)
Ever married	0.14	0.24	−0.10 (0.00)	0.05	0.07	−0.02 (0.12)	0.44	0.61	−0.17 (0.00)
Wealth quintile									
Lowest	0.07	0.21	−0.14 (0.00)	0.03	0.15	−0.12 (0.00)	0.18	0.34	−0.16 (0.00)
Lower	0.11	0.20	−0.09 (0.00)	0.09	0.20	−0.11 (0.00)	0.20	0.21	−0.01 (0.93)
Middle	0.20	0.21	−0.01 (0.39)	0.20	0.22	−0.02 (0.20)	0.19	0.19	0.00 (0.83)
Higher	0.28	0.20	0.08 (0.00)	0.31	0.21	0.10 (0.00)	0.18	0.17	0.01 (0.80)
Highest	0.35	0.18	0.17 (0.00)	0.37	0.22	0.15 (0.00)	0.25	0.10	0.15 (0.00)
Observations	1,009	15,749		776	11,258		233	4,491	

Notes: Averages computed with sample probability weights and clusters; *p*-values in parenthesis
Source: Computed by authors from GLSS 6, 2012/2013

Table II.
Descriptive statistics of variables by life insurance ownership disclosure status

it is possible that majority of those who reside in these areas either have no knowledge of insurance policies or are so poor that they never considered buying such policies. In contrast, most of the individuals who gave information about their life insurance ownership are males, married persons, individuals who have attained at least secondary education and those who are wage or salaried workers.

These established systematic differences suggest the presence of some biases associated with the disclosure of life insurance ownership statuses. Notwithstanding, the mean difference of the following variables age, number of dependants, ill health status, other employment types apart from wage or salaried and self-employment, never married and middle wealth category being insignificance in the full sample attributes the non-responses somewhat to inability to understand the question or sheer unwillingness to respond to the question. In conclusion, though some systematic differences exist to suggest the presence of selection bias, to a larger extent the decision to disclose information about life insurance ownership or not is random. With few peculiarities[8], similar conclusions can be drawn from the results based on the male and female subsamples.

Table III reports the descriptive statistics of the variables used in the study. The adjusted Wald test results show that for the age, region and place of residence, basic education and lower wealth quintile variables, the sampled male household heads significantly differ from

Variables	Full sample ($n = 1{,}008$)	Male subsample ($n = 775$)	Female subsample ($n = 233$)	Mean difference	p-value[a]
Life insured	0.565	0.560	0.585	−0.025	0.6710
Age	44.477	44.274	45.197	−0.924	0.5341
Dependants	1.972	2.118	1.454	0.665***	0.0010
Ill health status	0.160	0.146	0.208	−0.062*	0.0618
Male	0.780				
North	0.080	0.076	0.095	−0.019	0.4728
Urban	0.711	0.711	0.710	0.001	0.9964
Income	8.689	8.860	8.086	0.774***	0.0000
Employment type					
Other	0.060	0.045	0.113	−0.068**	0.0130
Wage/salaried	0.595	0.654	0.385	0.269***	0.0000
Self-employed	0.345	0.301	0.502	−0.201***	0.0000
Educational attainment					
No education	0.100	0.063	0.231	−0.168***	0.0000
Basic education	0.331	0.333	0.323	0.010	0.8613
At least secondary education	0.569	0.604	0.446	0.158***	0.0037
Marital status					
Never married	0.145	0.131	0.193	−0.062*	0.0827
Married	0.716	0.815	0.365	0.450***	0.0000
Ever married	0.139	0.054	0.442	−0.388***	0.0000
Wealth quintile					
Lowest	0.183	0.128	0.378	−0.250***	0.0000
Lower	0.205	0.197	0.233	−0.036	0.2800
Middle	0.215	0.241	0.126	0.115***	0.0012
Higher	0.232	0.248	0.176	0.072**	0.0497
Highest	0.164	0.186	0.087	0.099***	0.0039

Notes: All but age, number of dependants and income are in proportions. Averages computed with sample probability weights and clusters. [a]Adjusted Wald test. *,**,***Significant at 10, 5 and 1 percent levels, respectively
Source: Computed by authors from GLSS 6, 2012/2013

Table III. Descriptive statistics of variables by use in the estimations (averages)

their female counterparts in terms of the selected explanatory variables. Of the 1,008 household heads utilized[9], the majority, 56.5 percent, reported being owners of life insurance policies. However, more female heads (58.5 percent) than male heads (56 percent) reported having a life insurance policy. The data show that there are more male household heads, 78 percent, than female household heads.

The average age of the household heads sampled is about 45 years. Female heads are reported to be older than the male heads averagely. The male-headed households on average have more number of dependants than the female-headed households. In addition, more of the female-headed households (9.5 percent) reside in the three regions in the north of Ghana[10] than their male counterparts, 7.6 percent. Also, majority of the female heads (20.8 percent) in our sample reported being sick in the last two weeks relative to their male counterparts (14.6 percent).

On educational attainment, the sampled male heads have higher education than the female heads. Most of them also belong to households which earn relatively higher incomes. Compared with the female heads (38.5 percent), more of the male heads, 65.4 percent, are reported to be in wage or salaried employments. Conversely, more of the female heads relative to the male heads are either self-employed or in other employment types[11].

Though majority of the female heads sampled (44.2 percent) are either divorced, separated or widowed (ever been married), 81.5 percent of their male counterparts are married. While more than half of the female heads sampled are in the lesser wealth categories (lowest and lower), majority of the male heads, 67.5 percent, are in the average and greater categories of wealth (higher and highest).

4.2 Multivariate analyses (logit regression model)

The average marginal effects of the logit regression models are presented in Table IV. As mentioned above, to explore the effects of both wealth and income, and also as robustness check, two specifications were estimated for each model. Levels 3 and 4 of the table report on the female subsample while levels 5 and 6 report on the male subsample. The overall statistical significance of the respective models indicates the robustness of the models in explaining the determinants of life insurance demand in Ghana. Additionally, but for level 6, the non-significance of the *F*-adjusted mean residual test of the goodness-of-fit shows that the respective models fit the data well. Based on the diagnostic and goodness-of-fit tests, the model which controls for wealth (Specification A) is shown to be more relevant in explaining the predictors of life insurance than the model which controls for income (Specification B). Nevertheless, both specifications yield similar results.

The results from the logit models show that though ill health status; higher wealth; being self-employed, or in wage or salaried employment; and residing in either of the three northern regions[12] in Ghana broadly affect the demand for life insurance among both male and female heads, other factors are peculiar to either parties. Particularly, whereas female heads who are married and those with more dependants have a higher probability of purchasing life insurance policies, their male counterparts with higher education are more likely to buy life insurance policies.

5. Discussion

5.1 Determinants of life insurance demand

The current paper finds that wealth, employment type, region of residence and health status are important predictors of life insurance uptake among both male and female household heads in Ghana. Specifically, household heads who are ill, those who are self-employed or are in wage or salaried employments, those who reside in the three northern regions of Ghana and those who belong to wealthier households are found to have a higher predicted probability of purchasing life insurance policies. Knowledge of these predictors could guide insurers in strategizing their sales plans to meet demand and consequently enhance economic growth and development.

Our finding for wealth however contradicts the theoretical prediction by Lewis (1989). However, as justification, Giesbert (2010) posits that though the theoretical prediction of the effect of wealth on life insurance demand is uncertain, empirical findings indicate a positive relationship. Moreover, since wealthier persons are more risk averse (Paravisini *et al.*, 2013), they will be more likely to buy life insurance policies. Wealth is however found to be more significant among women than men. This is plausibly due to the fact that women are generally more risk averse than men and will therefore spend additional wealth in purchasing insurance (Watson and McNaughton, 2007; Borghans *et al.*, 2009; Croson and Gneezy, 2009; Sapienza *et al.*, 2009).

Though engagement in self-employment activities is highly significant among both female and male heads, engagement in wage or salaried employments is noted to be highly significant among male households only. By implication, the decision to buy life insurance policies is more influenced by being in wage or salaried employment among men than women. This reasonably relates to the fact that the proportion of females engaged in wage or salaried employment in Ghana, 11.7 percent, is lower than the proportion of males

Explanatory Variables	Full sample		Female subsample		Male subsample	
	Level 1[a]	Level 2[b]	Level 3[a]	Level 4[b]	Level 5[a]	Level 6[b]
Age	−0.005 (0.008)	−0.002 (0.008)	−0.017 (0.013)	−0.022 (0.013)	0.004 (0.009)	0.012 (0.009)
Age^2/1,000	0.040 (0.077)	0.007 (0.084)	0.215* (0.128)	0.260* (0.133)	−0.076 (0.091)	−0.149 (0.092)
Ill health status	0.109** (0.046)	0.114** (0.047)	0.145* (0.084)	0.151* (0.082)	0.102* (0.052)	0.114** (0.055)
Dependants	−0.040** (0.018)	−0.033* (0.020)	−0.166*** (0.058)	−0.139** (0.063)	−0.030 (0.021)	−0.018 (0.022)
Dependants^2	0.004* (0.002)	0.004 (0.003)	0.031** (0.012)	0.024* (0.012)	0.003 (0.002)	0.002 (0.002)
North (south[c])	0.299*** (0.113)	0.359*** (0.109)	0.323** (0.146)	0.426*** (0.130)	0.334*** (0.124)	0.387*** (0.118)
Urban (rural[c])	0.110 (0.074)	0.102 (0.076)	0.094 (0.104)	0.043 (0.110)	0.123 (0.076)	0.114 (0.079)
Male (female[c])	−0.035 (0.051)	−0.030 (0.049)				
Income		0.012 (0.029)		−0.035 (0.063)		0.024 (0.034)
Income^2		−0.003 (0.002)		0.001 (0.005)		−0.004 (0.003)
Employment type (other[c])						
Wage/salaried	0.279*** (0.080)	0.305*** (0.076)	0.237* (0.129)	0.250* (0.140)	0.335*** (0.094)	0.367*** (0.085)
Self-employment	0.267*** (0.077)	0.307*** (0.074)	0.268** (0.109)	0.256** (0.119)	0.331*** (0.094)	0.379*** (0.083)
Educational attainment (at least secondary[c])						
No education	−0.083 (0.077)	−0.108 (0.078)	−0.039 (0.130)	−0.018 (0.134)	−0.132 (0.087)	−0.190** (0.087)
Basic education	−0.121* (0.070)	−0.142** (0.072)	−0.102 (0.111)	−0.093 (0.128)	−0.127* (0.073)	−0.154** (0.075)
Marital status (never married[c])						
Married	0.006 (0.071)	0.018 (0.074)	0.298*** (0.102)	0.267** (0.119)	−0.081 (0.073)	−0.083 (0.077)
Ever married	0.015 (0.088)	0.012 (0.088)	0.058 (0.125)	0.103 (0.138)	−0.005 (0.105)	−0.022 (0.106)
Wealth quintile (highest[c])						
Lowest	−0.077 (0.067)		−0.183 (0.139)		−0.101 (0.075)	
Lower	−0.187*** (0.067)		−0.447*** (0.141)		−0.117* (0.069)	
Middle	−0.239*** (0.069)		−0.166 (0.142)		−0.239*** (0.069)	
Higher	−0.086 (0.064)		−0.495*** (0.138)		−0.037 (0.068)	
Observations	1,008	1,008	233	233	775	775
F-statistic[d]	3.29*** (0.000)	2.70*** (0.000)	2.38*** (0.004)	1.55* (0.099)	3.97*** (0.000)	3.11*** (0.000)
F-adjusted mean residual test[e]	0.365 (0.951)	0.840 (0.580)	0.421 (0.922)	1.514 (0.150)	0.335 (0.963)	1.907 (0.050)

Notes: Sample probability weights and clusters used. Linearized standard errors in parentheses. [a]Includes wealth but not income; [b]includes income but not wealth; [c]indicates reference category; [d]test of overall statistical significance of models (*p*-values in parentheses); [e]goodness-of-fit test (*p*-values in parentheses). *,**,***Significant at 10, 5 and 1 percent levels, respectively

Source: Computed by authors from GLSS 6, 2012/2013

Table IV. Average marginal effect results from logit model: determinants of life insurance demand

engaged in same activities, 29.5 percent (Ghana Statistical Service, 2014). More of the females engage in domestic/family employments, apprenticeship or self-employment activities for income.

The study further finds that household heads who are ill have a greater likelihood of acquiring life insurance policies than their counterparts who are not ill. This suggests that these individuals put away purchasing life insurance policies until they experience a higher probability of death. The positive relationship between ill health and the demand for life insurance is established by Lewis (1989) and Giesbert (2012). Lewis (1989) postulates that the higher the probability of death of the breadwinner, the more likely he is to demand for life insurance. Moreover, Decker and Schmitz (2016) reveal that health shocks increase risk aversion among persons. Insurers in Ghana therefore ought to devise strategies to address the undesirable effect of adverse selection among household heads.

5.2 Female heads

Female heads are reported to be less likely to purchase life insurance policies per every increase in the number of dependants[13]. Notwithstanding, the significance of the number of dependants squared variable indicates that the greater the number of dependants, the more likely the female heads are to buy life insurance policies. More often than not, female household heads in Ghana emerge in the absence of male heads. Hence, the financial burden of the female head's demise on her dependants is greater than that of the male head. They are therefore more likely to pursue alternative ways of transferring these risks associated with their death by purchasing life insurance policies. This probably justifies the fact that the number of dependants variable and its squared are important predictors of life insurance uptake among female heads in Ghana.

Furthermore, married female heads in Ghana are found to have a higher probability of purchasing a life insurance policy than their unmarried counterparts. It could be explained by the bequest motive for purchasing life insurance policies and affirms the earlier justification for the significance of the number of dependants variable and its squared. The findings made by Burnett and Palmer (1984) and Sarkodie and Yusif (2015) to the effect that the number of children is important in determining the demand for life insurance lend support to the current study though they disregard the probable gender dynamics. In the same way, Annamalah (2013) also finds a positive relationship between being married and the likelihood of purchasing a life insurance policy.

5.3 Male heads

Educational attainment of the household head is only significant in the male subsample. Compared with male heads who have acquired at least secondary education, those with no formal education or with basic education have lower probabilities of purchasing life insurance policies. The importance of education as a determinant of life insurance demand has been established by Burnett and Palmer (1984) and Annamalah (2013) as well. Conversely, Giesbert (2012) finds education to be an unimportant determinant of life insurance demand. The current paper shows that the importance of education in determining life insurance uptake varies across gender; such that though the variable is significant among men, it is insignificant among women. This could be due to the differences in men and women with respect to educational attainment.

6. Conclusion and implications

Using data from a cross-sectional survey, the paper provides a gender perspective on the determinants of life insurance demand among household heads in Ghana. First, since

almost 94 percent of the respondents refused to disclose their life insurance ownership information, the study sought to explore the characteristics of such persons and also ascribe probable reasons for their actions. Subsequently, an adjusted Wald test was performed to test the significance the mean differences of the selected explanatory variables across gender. Finally, logit regression techniques were employed to explore how the selected variables affect the uptake of life insurance policies in three samples (the full sample, male subsample and female subsample), with focus on the male and female disparities.

Generally, the study finds that persons who failed to give information about their life insurance ownership are mainly those with either basic or no formal education; those who have ever been married (divorced, separated or widowed); those who are self-employed; those who are members of less wealthy households; and those who reside in the upper east region, upper west region or northern region of Ghana. The results from the adjusted Wald test show that the sampled male heads statistically differ from their female counterparts in terms of the selected SED characteristics. Consequently, though ill health status; higher wealth; being self-employed, or in wage or salaried employment; and residing in either of the three northern regions[14] in Ghana broadly affect the demand for life insurance among both male and female heads, other factors are peculiar to either parties. Particularly, whereas female heads who are married and those with more dependants have a higher probability of purchasing life insurance policies, their male counterparts with higher education are more likely to buy life insurance policies. These variables are summarized in Table V.

By exploring the gender dynamics in the determinants of life insurance demand in Ghana, the current paper attempts to contribute effectively to advancing Ghana's insurance industry. Findings from existing related literature are reported to be mixed. This necessitates further studies on the determinants of life insurance demand. Though the current paper is not sufficiently nationally representative owing to the fact that majority of the interviewees failed to provide information about their life insurance ownership, it utilizes data from across all the ten administrative regions of Ghana. To the best of the authors' knowledge, no prior study has been conducted in this manner. The paper adds to the paucity of cross-sectional studies on life insurance demand in Africa. Also, based on the explored determinants, insurers could better regulate the purchase of their products by men and women to enhance economic growth and development.

Due to data unavailability, the paper fails to distinguish between the savings and mortality risk components of life insurance. The effect of risk aversion is as well excluded from the empirical exploration for the same reason. Furthermore, the high occurrence of missing observations in the data set, especially in the dependent variable, affects the representativeness of the paper. To further improve the insurance industry of Ghana, additional research is required to account for the probable gender disparity in the determinants of life insurance uptake in rural and urban areas. Also, some qualitative studies to explain vividly the quantitative results from this study are required.

Gender	Positive	Negative
Generic	Ill health; region of residence (north); self-employment; wage or salaried employment	Lower wealth
Male heads only	–	No formal education; basic education
Female heads only	Dependants squared; married	Dependants

Table V.
Summary of relevant predictors of life insurance demand

Notes

1. Defined as the percentage share of gross domestic product (GDP) accounted for by insurance premiums.
2. 16,772.
3. Representing 532 respondents.
4. Representing 477 respondents.
5. Representing 15,763 respondents.
6. One other observation was lost due to the presence of missing values in the selected explanatory variables.
7. In Life_{ij}, $j = \{0(\text{both}); 1(\text{male}); 2(\text{female})\}$; $i =$ respondent.
8. Including the insignificance of the married and ever been married in the male subsamples; the insignificance of north, lower and higher wealth quintiles, and the significance of the never married, age and number of dependants in the female subsample.
9. A male head failed to disclose his health status; hence, the reported observations for the full sample and male subsample further reduced by 1 observation each.
10. Upper east, upper west and northern regions.
11. Domestic employment/family employment/apprenticeship.
12. Upper east, upper west and northern regions.
13. Persons below 18 years and those over 64 years.
14. Upper east, upper west and northern regions.

References

Abaidoo, G.G. and Nwosu, F.O. (2016), "Customer satisfaction strategies for life insurance growth in Ghana", *Journal of Functional Education*, Vol. 3 No. 1, pp. 1-18.

Alhassan, A.L. and Biekpe, N. (2016), "Determinants of life insurance consumption in Africa", *Research in International Business and Finance*, Vol. 37 No. C, pp. 17-27.

Ankomah, A. (1996), "Premarital relationships and livelihoods in Ghana", *Gender & Development*, Vol. 4 No. 3, pp. 39-47.

Annamalah, S. (2013), "Profiling and purchasing decision of life insurance policies among married couples in Malaysia", *World Applied Sciences Journal*, Vol. 23 No. 3, pp. 296-304.

Beck, T. and Webb, I. (2003), "Economic, demographic, and institutional determinant of life insurance consumption across countries", *World Bank Economic Review*, Vol. 17 No. 1, pp. 51-88.

Boadu, F., Dwomo-Fokuo, E., Boakye, J.K. and Frimpong, A.O. (2014), "Assessing the life insurance industry in Ghana", *European Journal of Business and Management*, Vol. 6 No. 21, pp. 14-23.

Borghans, L., Golsteyn, B.H.H., Heckman, J.H. and Meijers, H. (2009), "Gender differences in risk aversion and ambiguity aversion", *Journal of the European Economic Association*, Vol. 7 Nos 2-3, pp. 649-658.

Bortei-Doku, E. and Aryeetey, E. (1995), "Mobilizing cash for business: women in rotating susu clubs in Ghana", in Ardener, S. and Burman, S. (Eds), *Money-Go-Rounds: The Importance of Rotating Savings and Credit Associations for Women*, Berg Publishers, Oxford and Herndon, VA, pp. 77-94.

Burnett, J.J. and Palmer, B.A. (1984), "Examining life insurance ownership through demographic and psychographic characteristics", *The Journal of Risk and Insurance*, Vol. 51 No. 3, pp. 453-467.

Çelik, S. and Kayali, M.M. (2009), "Determinants of demand for life insurance in European countries", *Problems and Perspectives in Management*, Vol. 7 No. 3, pp. 32-37.

Chen, P., Ibbotson, R.G., Milevsky, M.A. and Zhu, X.K. (2006), "Human capital, asset allocation, and life insurance", *Financial Analysts Journal*, Vol. 62 No. 1, pp. 1-13.

Croson, R. and Gneezy, U. (2009), "Gender differences in preferences", *Journal of Economic Literature*, Vol. 47 No. 2, pp. 448-474.

Dougherty, C. (2007), *Introduction to Econometrics*, Oxford University Press, Oxford.

Decker, S. and Schmitz, H. (2016), "Health shocks and risk aversion", *Journal of Health Economics*, Vol. 50 No. C, pp. 156-170.

Eck, J.R. and Nizovtsev, D. (2006), "The impact of culture on the purchase of life insurance in Latin America and the Caribbean", *International Business & Economics Research Journal*, Vol. 5 No. 1, pp. 31-45.

Emamgholipour, S., Arab, M. and Mohajerzadeh, Z. (2017), "Life insurance demand: middle East and North Africa", *International Journal of Social Economics*, Vol. 44 No. 4, pp. 521-529.

Fischer, S. (1973), "A life cycle model of life insurance purchases", *International Economic Review*, Vol. 14 No. 1, pp. 132-135.

Gandolfi, A.S. and Miners, L. (1996), "Gender-based differences in life insurance ownership", *The Journal of Risk and Insurance*, Vol. 63 No. 4, pp. 683-693.

Ghana Statistical Service (2014), *Ghana Living Standards Survey, Report of Sixth Round (GLSS 6)*, Ghana Statistical Service, Accra.

Ghosh, A. (2013), "Does life insurance activity promote economic development in India: an empirical analysis", *Journal of Asia Business*, Vol. 7 No. 1, pp. 31-43.

Giesbert, L. (2010), "Uptake of micro-life insurance in rural Ghana", Chronic Poverty Research Centre 2010 Conference – Ten Years of "War against Poverty": What Have We Learned Since 2000 and What Should We do 2010-2020?, University of Manchester, 8-10 September.

Giesbert, L. (2012), "Subjective risk and participation in micro life insurance in Ghana", *En ligne*, available at: www.giga-hamburg.de (accessed 14 April 2017).

Guerineau, S. and Sawadogo, R. (2015), "On the determinants of life insurance development in Sub-Saharan Africa: the role of the institutions quality in the effect of economic development", Working Papers, halshs-01178838, HAL.

Kaushal, S. and Ghosh, A. (2017), "Economic growth and the development of banking and insurance sector in the post-liberalized India: an empirical analysis", *International Journal of Social Economics*, Vol. 44 No. 12, pp. 2187-2207.

Lewis, F.D. (1989), "Dependents and the demand for life insurance", *The American Economic Review*, Vol. 79 No. 3, pp. 452-467.

Loke, Y.J. and Goh, Y.Y. (2012), "Purchase decision of life insurance policies among Malaysians", *International Journal of Social Science and Humanity*, Vol. 2 No. 5, pp. 415-420.

Luciano, E., Outreville, J.F. and Rossi, M. (2015), "Life insurance demand: evidence from Italian households; a micro-economic view and gender issue", Network for Studies on Pensions, Aging and Retirement, available at: www.netspar.nl/assets/uploads/010_Rossi.pdf (accessed 14 April 2017).

Mahdzan, N.S. and Victorian, S.M. (2013), "The determinants of life insurance demand: a focus on saving motives and financial literacy", *Asian Social Science*, Vol. 9 No. 5, pp. 274-284.

Matul, M., McCord, M.J., Phily, C. and Harms, J. (2010), *The Landscape of Microinsurance in Africa*, International Labour Organization, Geneva.

Mishra, M.K. (2014), "Demand analysis for life insurance in India: some empirical observations", *International Journal of Advanced Research*, Vol. 2 No. 5, pp. 704-814.

Mongin, P. (1998), "Expected utility theory", in Davis, J., Hands, D. and Maki, U. (Eds), *The Handbook of Economic Methodology*, Edward Elgar, London, pp. 342-350.

National Insurance Commission (2013), "Annual report", National Insurance Commission, available at: http://nicgh.org/wp-content/uploads/2016/07/NIC_Annual_Report_2013.pdf (accessed 14 April 2017).

Paravisini, D., Rappoport, V. and Ravina, E. (2013), "Risk aversion and wealth: evidence from person-to-person lending portfolios", Mimeo, available at: https://www0.gsb.columbia.edu/mygsb/faculty/research/pubfiles/3506/RiskAversion%20JFE011413.pdf (accessed 16 April 2017).

Redzuan, H. (2014), "Analysis of the demand for life insurance and family Takāful", working paper, Australian Academy of Business and Social Sciences Conference 2014, available at: www.aabss.org.au/system/files/published/AABSS2014_290.pdf

Sarkodie, E.E. and Yusif, H.M. (2015), "Determinants of life insurance demand, consumer perspective – a case study of Ayeduase-Kumasi community, Ghana", *Business and Economics Journal*, Vol. 6 No. 3, pp. 1-4, doi: 10.4172/2151-6219.1000170.

Sapienza, P., Zingales, L. and Maestripieri, D. (2009), "Gender differences in financial risk aversion and career choices are affected by testosterone", *Proceedings of the National Academy of Sciences of the United States of America*, Vol. 106 No. 36, pp. 15268-15273.

Schlag, C.H. (2003), "Determinants of demand for life insurance products – theoretical concepts and empirical evidence", Mimeo, Swiss Reinsurance Corporation, available at: https://pdfs.semanticscholar.org/eae1/b6be73e7f4bffc67e7d6fe7b99a794553844.pdf (accessed 16 April 2017).

Sulaiman, L.A., Migiro, S. and Yeshihareg, T. (2015), "Investigating the factors influencing the life insurance market in Ethiopia", *Problems and Perspectives in Management*, Vol. 13 No. 2, pp. 152-160.

Swiss Re Sigma Report (2014), "World insurance in 2013: steering towards recovery", available at: www.tsb.org.tr/Images/Documents/Sigma3_2014_En.Pdf (accessed 12 January 2017).

Swiss Re Sigma Report (2016), "World insurance in 2015: steady growth amid regional disparities", available at: www.tsb.org.tr/images/Documents/sigma_3_2016_en.pdf (accessed 12 January 2017).

von Neumann, J. and Morgenstern, O. (1944), *Theory of Games and Economic Behaviour*, Princeton University Press, Princeton, NJ.

Watson, J. and McNaughton, M. (2007), "Gender differences in risk aversion and expected retirement benefits", *Financial Analysts Journal*, Vol. 63 No. 4, pp. 52-62.

Yaari, M. (1965), "Uncertain lifetime, life insurance, and the theory of the consumer", *Review of Economic Studies*, Vol. 32 No. 2, pp. 137-150.

Zietz, E.N. (2003), "An examination of the demand for life insurance", *Risk Management and Insurance Review*, Vol. 6 No. 2, pp. 159-191.

Further reading

Akotey, O.J., Osei, K.A. and Gemegah, A. (2011), "The demand for micro insurance in Ghana", *The Journal of Risk Finance*, Vol. 12 No. 3, pp. 182-194.

Ćurak, M., Džaja, I. and Pepur, S. (2013), "The effect of social and demographic factors on life insurance demand in Croatia", *International Journal of Business and Social Science*, Vol. 4 No. 9, pp. 65-72.

Grossman, M. (1972), "On the concept of health capital and the demand for health", *Journal of Political Economy*, Vol. 80 No. 2, pp. 223-249.

Hakansson, N. (1969), "Optimal investment and consumption strategies under risk, an uncertain lifetime, and insurance", *International Economics Review*, Vol. 10 No. 3, pp. 443-466.

Kjosevski, J. (2012), "The determinants of life insurance demand in central and Southeastern Europe", *International Journal of Economics and Finance*, Vol. 4 No. 3, pp. 237-247.

Showers, V.E. and Shotick, J.A. (1994), "The effects of household characteristic on demand for insurance: a tobit analysis", *Journal of Risk and Insurance*, Vol. 61 No. 3, pp. 492-502.

Corresponding author
Samuel Ampaw can be contacted at: samie.ampaw@yahoo.com