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2016

Online at <https://mpra.ub.uni-muenchen.de/70135/>
MPRA Paper No. 70135, posted 06 Apr 2016 13:54 UTC

**Effect of financial literacy on willingness to pay for micro-insurance by
commercial market business operators in Ghana**

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Abstract

This study investigated the effect of financial literacy on willingness to pay for micro-insurance among informal commercial market business operators in Ghana. Heckman's Two-Step Estimation Technique is used to examine data on 612 informal commercial market business operators from selected major urban market centres in Ghana. The results indicate that financial literacy increases the amount willing to pay for micro-insurance. Other determinants of willingness to pay for micro-insurance include marital status, dependents, savings, trust, premium payment mode and income. The study recommends that microfinance institutions should strengthen financial education to increase the uptake of micro-insurance.

Keywords: Financial literacy; Willingness to pay; Microfinance; Micro-insurance; commercial market business operators, Ghana

1. Introduction

Microfinance has assumed a significant role in delivering banking and allied financial services and deepening financial inclusion, especially offering open access to credit and savings mobilization at an affordable cost to the financially excluded. Through microfinance many poor households have one business or the other. However, poor households operate informally, have their livelihoods dependent on self-employed ventures, and they are exposed to countless risks. To cope with risks and shocks the vulnerable informal sector operator has a range of informal coping mechanisms; mainly family supports, borrow from friends, rely on limited savings, and at worse sell an asset. According to Siegel et al. (2001), these informal risk-pooling schemes relied on by the vulnerable to cope with shocks, however, offer limited protection, often not readily available to depend on and, are prone to fail during emergencies.

It, therefore, appears that the reliable buffer for poor victims of livelihood shocks may find meaning in an affordable insurance scheme. Micro-insurance is hailed as an important tool for risk management, social protection and fighting poverty that emanate from shocks and a plethora of studies attest to this (Janzen and Carter, 2013; Kishor, 2013; Mukhtar, 2013; Akter, 2012; Parvathi, 2012; Hoefler & Midgley, 2012). It has however, been argued that insurance is not always accessible and affordable to everyone and it remains the preserve of the regular income earners and the wealthy excluding the poor small businesses and irregular wage earners (Farooqui, 2013). Among the various reasons cited for this sad spectacle are that the small business owners in most cases, do not only lack the

ability to pay out-of-pocket costs for insurance but also lack the knowledge and/or financial literacy necessary to adopt and utilize financial products, particularly micro-insurance (Donfoute and Makaudze, 2011).

Financial literacy is the ability to analyze financial information, manage and communicate about personal financial decisions so as to impact one's material well-being (Abreu and Mends, 2010). Thus, financial literacy influences one's ability to process economic information about financial matters and make informed decision (Mahdzan and Tabiani, 2013). The literature confirms that there is strong link between financial literacy, use of financial services and consumer welfare (Lusardi and Mitchell, 2008; Gine, Townsend and Vickery, 2008; Cole, Sampson and Zia, 2009). Other studies claim that individuals and households with limited knowledge of the features of contemporary financial services tend to have poor financial planning and subsequently poor financial decision making (Stango and Zinman, 2006; Lusardi and Mitchell, 2007). Low financial literacy has also been found to lead to poor risk diversification, inefficient portfolio allocations and poor use of financial services (Japelli and Padula, 2011).

The literature further indicates that besides being financially literate, a person must be willing to pay for micro-insurance to make it successful (Aidoo et al., 2014). Akter (2012) maintains that the success story of micro-insurance in reducing livelihood vulnerabilities hinges on the target population's willingness and ability to pay the true cost of the insurance scheme. Willingness to pay for micro-insurance can be envisioned as two-step process; the decision of whether or

not to participate in micro-insurance; once a decision is made to participate in micro-insurance, the next step is to decide how much to pay. In as much as this argument sounds plausible, it is, however, imperative to acknowledge that target clients knowledge about the features of a particular insurance scheme plays significant role in convincing a potential insuring person to subscribe to insurance.

Theoretically, willingness to pay for a product or service is rooted in demand theory. As conceptualized by Ahlersten (2008), demand is not only concerned about actualization of consumption decision, but about what one is capable and willing to pay for a product at a particular time. In furtherance to this argument, the economic theory of compensating valuation subscribed to by Varian (2009), view willingness to pay as the measure of the amount that must be taken away from a person's income while keeping his utility constant. Thus, to ascertain effective demand for a product or service it is imperative to be well informed about the true price at which many consumers will be willing to patronize the product.

Even though a strong link has been established among financial literacy, willingness to pay and uptake of micro-insurance in both the theoretical and empirical literature (Akter, 2012; Kuwawenarua et al., 2011 Falola et al. 2013; Khan and Ahmed, 2013; Danso-Abbeam et al. 2014), empirical research linking These three variables in the informal commercial market business sector that has a low uptake of insurance but has suffered a number of fire outbreaks in recent times in Ghana has remained largely unexplored. The objective of this study,

therefore, is to examine the effect of financial literacy on willingness to pay for micro-insurance among informal commercial market business operators in Ghana.

The results of the study show that financial literacy, marital status, number of dependents, savings, trust, premium payment mode and income influence willingness to pay for micro-insurance in Ghana. The rest of the paper is organized as follows: section two provides a review of related literature; the data and methodology are presented in section three; section four deals with the results and discussion, and conclusions and policy recommendations are delivered in section five.

2. Literature Review: the market for micro-insurance

Theoretical Literature

Micro-insurance has been hailed by many (Holzmann, Sherbune and Tesliuc, 2003; Adjei, Arun and Hossain, 2009) as a new revolution in microfinance for risk management, social protection and poverty reduction. Micro-insurance as a facet of microfinance stands as a bridge to halt the impoverishment that forces the vulnerable to sell assets, deplete hard worn savings due to liquidity constraint, partly fill the deficit gap of public social security schemes, strengthen productive capacity and expand economic opportunities to vulnerable groups (Tabea, 2010; Fletschner and Kenney, 2011). It is argued that sinking into poverty cannot be equated to lack of income but timely intervention of income at the time it is most needed (Bateman, 2010). Thus, the potential welfare enhancing of any micro-insurance service lies in the ability to offer improvement in the welfare of the

vulnerable. Though considerable literature points to the fact that micro-insurance has the potential to mitigate and restore the victims of unexpected business shock to the state in which they were (Boltzen and Van Den Bergh, 2011; Bendig and Arun, 2011; Brown and Churchill, 1999), scores of literature still hold contrary views on underpinning factors behind micro-insurance patronage (Browne and Hoyt, 2000; Chowdhury et al., 2007; Kjosevski, 2012). Thus, this section reviews theoretical and empirical literature on the link between financial literacy and willingness to pay for micro-insurance scheme.

Theoretically, some early development economists emphasized the relationship between material progress and the state of the financial markets (Kuznet, 1966; Gurley and Shaw, 1967; Mckinnon and Goldsmith, 1973). These early economists supported the argument for the removal of financial market imperfections, which impede rapid progress. Merton (1989) emphasizes the investigation into the micro behaviour of agents in the inter-temporal deployment of their resources in an environment of uncertainty. This thought presumes that economic organizations exist to facilitate resource allocation function to fulfill their risk-pooling and risk-sharing roles of financial intermediation to promote insurance take-up at minimum cost. In furtherance to this, Khan (2008) argues that the reluctance of commercial financial intermediaries to extend micro-insurance services to the poor is underpinned by financial illiteracy. Continuing the debate on the role financial intermediaries in removal of information asymmetry, Hassan, Sanchez and Yu (2011) assume strong connection between financial intermediation and removal of information asymmetry. Thus,

theoretically, financial institutions through financial literacy arise to mitigate the impact of information asymmetry, which impedes financial market awareness. The reason is, as financial knowledge increases, individuals become conscious and familiar with the financial system and begin to express willingness to participate in the financial market. This supports the argument that financially unsophisticated individuals have a huge responsibility to make sensible and accurate financial investment decisions such as borrowing, investing, saving and insurance (Lusardi and Mitchell, 2014).

This presupposes that based on human expectations about future uncertainty, fully rational and well-informed individuals will tend to consume less than his or her earnings in order to save to smoothing future consumption shortfalls. Following this assumption, the individual's portfolio allocation decision is posited to hinge on arrangement of optimal savings and decumulation of savings to smooth marginal utility over his or her lifetime (Friedman, 1957). This life cycle optimization behaviour is posited to be influenced by preference, liquidity constraint and social safety net benefits. However, the decision to utilize financial product is underpinned by understanding financial market information. Thus the desire to patronize financial service cannot be actualized due to market imperfection emanating from information asymmetry (Hastings and Tejada-Ashton, 2008)

Empirical Literature

Empirically, Kuwawenaruwa et al. (2011) used cross-sectional survey data drawn from 2224 households in Tanzania and found that gender, area of residence, levels of income, formal education and religion had significant influence on willingness to pay for micro-insurance. The authors, however, found no relationship between financial literacy and willingness to pay for micro-insurance. In a related study, Babatunde et al. (2012) employed data on 360 household heads in Nigeria to study willingness to pay for micro-insurance. Though the study concludes that financial education could improve willingness to participate in micro-insurance, the link between financial literacy education and willingness to pay for micro-insurance was not clear.

In a similar study, Falola et al. (2013) investigated the determinants of willingness to pay for cocoa farmers' micro-insurance in Nigeria. Using primary data drawn on 120 farmers and the probit regression, the results showed that age of a household head, educational level and farm income significantly influence willingness to pay for micro-insurance scheme. Though the study concludes further that level of awareness and financial information underpin willingness to pay for micro-insurance, the downside of this conclusion is found in the failure to analyze the possible impact of financial literacy intervention as a conduit for financial information assimilation and hence the decision to participate in micro-insurance.

In furtherance to this, Khan and Ahmed (2013) points to literacy – gap or lack of knowledge as important potential barrier to insurance market participation. Using quasi experimental study design, they assessed the impact of educational intervention on willingness to pay for micro-insurance in Bangladesh. A major conclusion from their study hinged on the fact that educational intervention which improves financial literacy could impact on insurance decision and willingness to pay for micro-insurance. However, the extent to which financial literacy impacts willingness to patronize micro-insurance was not clear from their study. Danso-Abbeam et al. (2014) analyzed the determinants of willingness to pay for farm micro-insurance by small holder cocoa farmers using cross-sectional data involving 201 respondents in Ghana. The study found premium amount willing to pay to be influenced by marital status, educational attainment, ownership of farm land, farmers' awareness and income. They suggest that awareness creation through financial literacy will impact significantly on micro-insurance intervention programme. However, failure to account for distinct impact of financial literacy on amount willing to pay for micro-insurance blurs the beauty of this conclusion.

Becchetti et al. (2013) examined the link between financial literacy and participation in the financial market using experimental design involving 944 respondents in Italy. They found financial education as major predictor of financial market participation. However, the studies failed to empirically investigate the nature of the link between financial literacy and willingness to participate in insurance market. Narges and Laily (2011) examined the

determinants of financial wellness of 2000 respondents in Malaysia. They found financial literacy significant in explaining participation in the financial market and financial wellness. The study further concludes that financial education should occupy the top most position of policy intervention to improve participation and utilization of financial services. However, the link between financial literacy and micro-insurance market participation was not empirically examined. This study will investigate the effect of financial literacy on the willingness of commercial market business operators to take up micro-insurance.

3. Data and Method

The study employed cross-sectional study design. The data was elicited from 612 informal commercial market business operators in six selected urban commercial market centres in northern, central and coastal Ghana through in-person face-to-face interview. The data collection exercise began in early June, 2014 and ended in the last week of August, 2014. The survey data contains information on features such as the demographics, willingness to participate in micro-insurance number of years in business, income levels, access to credit, financial knowledge of the respondent, trust in insurance as risk management tool and ownership of savings.

3.1. Target Population and Sampling Frame

The study targeted the economically active informal commercial market business operators who conduct daily trading activities in the markets centres. The justification for the concentration on informal commercial market business

operators emanates from the fact that, this group who conduct daily commercial activities in these market centres is relatively more susceptible to hazards, because most of them have their business assets permanently situated in the markets. Moreover, this target group is easily accessible for purposes of information gathering. The study employed multi-stage cluster sampling technique. First the study areas were segmented into three main zones (clusters): northern cluster, central cluster and coastal cluster. Second, two (2) market centres were selected from each cluster based on number of vibrant markets centres in each cluster. The study selected only vibrant urban market centres where predominantly market participants had their business assets permanently situated. Based on this criterion, each cluster was identified with four (4) main major market centres. Then, two (2) most relatively vibrant markets were selected from each zone (cluster). The respondents were selected by convenience from the market centres. The total sample size used in this study was determined by simplified statistical formula suggested by Magnani (1997) and Godden (2004). (See appendix).

3.2. Model Specification and Estimation Technique

Given the potential selection bias, which occurs out of estimating the effect of financial literacy on amount willing to pay for financial literacy, it is conceivable that after controlling for the regressors, those respondents with positive willingness to pay a given amount to participate in micro-insurance programme are not randomly selected from the population. This is so because individuals self-select to participate or not to participate in micro-insurance programme. This imposes a potential restriction on the model. The implication, therefore, is that the

resultant Ordinary Least Squares (OLS) estimates suffer from selection bias. Accordingly, a selection model is required to take care of the possible bias by allowing for possible dependence in the two parts of the model. To deal with the problem of selection bias, this study employed Heckman's Two-Step estimation technique, which caters for selection bias.

The equation for amount willing to pay was specified as:

$$AmtWiling = f(\delta, \theta, \pi, \gamma) \quad (1)$$

Where; *AmtWiling* is amount willing to pay for micro-insurance, δ is financial literacy index, θ is premium, π is set of socio-demographic characteristics and γ is income.

Let $\eta = \theta, \pi, \gamma$ and writing (1) in explicit form;

$$\text{Thus: } AmtWiling = \beta_1 + \beta_2 \eta + \mu \quad (2)$$

Where, *AmtWiling* is already defined, β_i are parameters to be estimated, η is vector of explanatory variables μ is the error term.

From here, Ordinary Least Squares (OLS) model could be estimated. However, such estimation suffers from sample selection bias. This emanates from the fact that individuals self-select to participate in micro-insurance or not. Thus the expected amount willing to pay for micro-insurance for those who are willing to pay certain amount to participate in micro-insurance is given by the joint density bivariate normally distributed variables as expressed by the form:

$$E[A_i|P_i = 1] = \beta' \eta_i + E[\varepsilon|P_i = 1] = \beta' \eta_i + \sigma \rho_\varepsilon \frac{\varphi(y'\tau)}{\Phi(y'\tau)} \quad (3)$$

Where, $\varphi(\cdot)$ and $\Phi(\cdot)$ are the probability density and cumulative distribution functions of the standard normal distribution. The estimate of the ratio of $\varphi(\cdot)$ and $\Phi(\cdot)$ represents the inverse mills ratio (IMR) or the control function, denoted as λ , which usually takes care of possible selection bias.

Similarly the conditional expectation of the amount willing to pay for those who will not participate in micro-insurance scheme is also expressed as:

$$E[A_i|P_i = 0] = \beta' \eta_i + E[\varepsilon|P_i = 0] = \beta' \eta_i - \sigma \rho_\varepsilon \frac{\varphi(y'\tau_i)}{1-\Phi(y'\tau_i)} \quad (4)$$

From these joint conditional expectation expressions, the direction of ρ , that is, if the estimate of ρ is positive (negative), is an indication of whether the OLS method is bias upwards (downwards). However, the IMR corrects for any potential bias in the OLS estimates. Therefore, the sign and the significance of the $\sigma\rho$ estimate give an idea of existence of any selection bias.

3.3 The Empirical Model

The Heckman's two-step technique involves selection model and the model of interest (the outcome model). Given the fact that selection model is required to take care of the possible bias by allowing for possible dependence in the two parts of the empirical model, joint estimation of the following selection and outcome empirical models were considered:

$$\Pr(\text{willingPart}_i = 1|x_i) = \beta_0 + \beta_1 \text{Sex}_i + \beta_2 \text{Age}_i + \beta_3 \text{Mari_Stat}_i + \beta_4 \text{Market Levy}_i$$

$$\begin{aligned}
& +\beta_5Fin_Lit_i+\beta_6Depend_t_i+\beta_7Years_Biz_i+\beta_8Savings_i+\beta_9Trust_i+\beta_{10}Premium_i \\
& +\beta_{11}Creditaccessr_i+\beta_{12}Peer_i+\beta_{13}Riskexper+\beta_{14}Income_i + \varepsilon_i \quad (5)
\end{aligned}$$

Where, peer influence (*Peer*) and risk experienced (*Riskexper*) are exclusive restriction variables, other explanatory variable include sex, Age, marital status (*Mari_Stat*), market levy, Financial literacy (*Fin_Lit*), mode of premium payment (*premium*), access to credit (*creditaccess*), and income of a respondent. To ensure robust identification and estimates in empirical practice, it is appropriate that exclusive restriction is imposed. In this regard, the selection model captured as equation (5), should be inclusive of exogenous variable(s) that is excluded from the outcome model also captured as equation (6). Equation (5) is a specification of a probit model, which predicts the probability that an individual will participate in micro-insurance scheme. The outcome equation of interest is therefore, specified as follows:

$$\begin{aligned}
AmtWilling = & \beta_0+\beta_1Sex_i+\beta_2Age_i+\beta_3Mari_Stat_i+\beta_4MarketLevy_i \\
& +\beta_5Fin_Lit_i+\beta_6Depend_t_i+\beta_7Years_BiZ_i+\beta_8Savings_i+\beta_9Trust_i \\
& +\beta_{10}Premium_i +\beta_{11}Creditaccessi+\beta_{12}Income_i+\mu_i \quad (6)
\end{aligned}$$

The descriptions and measurement of the variables included in the models have been explained in the appendix A to this work.

The Construction of the Financial Literacy Index

The financial literacy variable (**Fin_Lit**) captured information on selected economic and financial concepts applicable to individual's day-to-day financial decision making and future portfolio allocation decision. Thus, knowledge and understanding about economic and financial concepts such as inflation, money transfer, budget, interest on loan, microcredit, "susu", mobile money, ATM, minimum balance, shares, cheque account, mortgage, insurance and e-zwich. The financial literacy index (**Fin_Lit**) was constructed as a function of specific underlying financial concept variables V_{ij} , such that V_{ij} represents individual i 's understanding or lack of understanding of concept variable j . Therefore, our functional specification takes the form:

$$Fin_Lit_i = f(V_{ij}) \quad (7)$$

The expanded form of the functional specification is then expressed as follows:

$$Fin_Lit_i = V_{i1} + V_{i2} + \dots + V_{ij} \quad (8)$$

Following the method employed by Burncrot et al. (2011), equal weights (W) were assigned to each financial concept variable based on correct answers provided by the respondent on each of the financial concept. The weights were assigned in such a way that a correct answer attracts one (1) and incorrect answer attracts zero (0). Thus an individual who answered all the fourteen financial concept correctly had an index of (14). Whereas, an individual who answered none of the fourteen questions incorrectly had an index of (0). Basically, the method gives equal weights to each financial literacy question. Thus the extended

form of the financial literacy index for the purpose of this study assumes the following form:

$$Fin_Lit_i = V_{i1}W + V_{i2}W + \dots + V_{ij}W \quad (9)$$

Where Fin_Lit_i represents composite index of financial literacy, W is corresponding weights assigned to the score of each concept variable j .

4. Results and Discussion

The results and discussion on the estimated Heckman's Selection Model is presented in this section. Table 1 first describes the demographic characteristics of the respondents.

Table 1: Demographic Characteristics of respondents

Variable	Description	Observations	Mean	Std. Deviation
Sex	A female dummy (1/0)	612	0.392	0.488
Age	Number of years	612	38.058	11.559
Mari_Status	Current marital status:	612		
	<i>Single</i>	194	0.318	0.234
	<i>Married</i>	334	0.545	0.498
	<i>Divorced</i>	57	0.093	0.290
	<i>Widowed</i>	27	0.044	0.205
Depend	Dependents	612	3.717	2.602

Source: Field survey data, (2014)

Table 1 presents a summary of demographic characteristics of the respondents engaged in this study. These include Sex, Age, marital status of the respondent and dependents under the care of the respondent. Sex is a female dummy, Age was used to capture the number of years of age of the respondent, and the mean

age is given as 38.058 or 38 years. Also, **Mari_Status** denotes current marital status of the respondent. It is captured as a categorical variable, which include single, married, divorced and widowed. 194 of the respondents were single, 334 were married, 57 had divorced and 27 were widows. The number of dependents under the care of the respondent is denoted by **depend**, with a mean number of approximately 4 dependents. Table 2 presents results of the first stage regression, which predicts the probability of respondent's willingness to participate in micro-insurance scheme given the predictor variables.

Table 2: Results of Probit estimation (dependent variable: willingness to participate in micro-insurance)

Variables	Coefficient	Std.errors
Sex	0.179	0.146
Age	0.009	0.008
Mari_Status:	-	-
Single	0.414	0.390
Married	0.434	0.341
Divorced	0.234	0.378
Market_Levy	0.002	0.008
Fin_Lit	0.018	0.061
Depend	-0.052*	0.052
Year-BiZ	0.006	0.009
Savings	0.060	0.001
Trust	-0.368***	0.138
Premium:	-	-
Yearly	0.080	0.384
Half yearly	0.729	0.393
Quarterly	0.545	0.362
Monthly	0.545***	0.253
Creditaccess	0.385	0.140
Peer	0.384**	0.180
Riskexper	0.364***	0.139
Income	0.298	0.414
Constant	-0.362	0.719

* = significant at 10%; ** = significant at 5%; *** = significant at 1%.

Note: *Widowed* and *daily* are used as reference categories for *mari_status* and premium.

Source: Estimated from field survey data, (2014)

The number of dependents under the care of a respondent (**Depend**) has a negative association with the probability of willingness to participate in micro-insurance. The coefficient of -0.052 suggests that as the number of dependents under the care of the respondent increases the probability of expression willingness to participate in micro-insurance decreases. This is possible, because additional dependents increases the burden to take care of the additional member

and this makes a prospective insured less inclined to express willingness to participate in micro-insurance scheme.

The coefficient of **Trust** is -0.368 , this means that trust in micro-insurance reduces the probability of willingness to participate in micro-insurance scheme. This could be so because peoples' perception and confidence in insurance contract have eroded trust for financial contract like micro-insurance due to uncertainty in fulfilling contract terms (Yusuf et al., 2009). This makes potential insuring public less probable of participating in micro-insurance contract.

Again, the coefficient 0.545 for **Monthly** premium payment mode category show positive association with probability of willingness to participate in micro-insurance scheme. This implies that individuals are more probable of participating in micro-insurance when premium is paid monthly compared with their counterparts in daily payment mode category. This is plausible because the longer the premium collection period, the more flexible it is in enabling people to afford the regular premium payment obligation. This result suggests that the more flexible the premium payment is, the more people tend to be inclined in participating in micro-insurance.

Similarly, the respondent's risk experience (**Riskexper**) in business has a positive association with probability of willingness to participate in micro-insurance scheme. Given the coefficient of **Riskexper** as 0.364 , then an increase in number of risks experienced in business increases the probability of willingness to participate in micro-insurance. A possible reason is that experiences with risk in

business have the tendency of influencing and appealing to one's conscience and hence the inclination to offer to participate in micro-insurance scheme. This result confirms the finding of Schindler (2010).

Again, peer influence (**peer**) is positively associated with the probability of willingness to participate in micro-insurance. This means that the number of business peers known to have insured their business assets increases with the probability of participating in micro-insurance. Thus as **peer** increases given the coefficient of 0.384, the probability of participating in micro-insurance also increases. One could be influenced by his or her business peers known to have insured their businesses. The results of the outcome model of interest; which is an estimation of factors influencing amount willing to pay for micro-insurance is presented in Table 2.

Table 3: Results of Heckman estimation (dependent variable: amount willing to pay)

Variable	Coefficient	Std. error
Sex	0.095	0.084
Age	0.010	0.500

Mari_status:	-	-
<i>Single</i>	0.409*	0.239
<i>Married</i>	0.473**	0.213
<i>Divorced</i>	0.440*	0.244
Market Levy	-0.007	0.005
Fin_Lit	0.026**	0.012
Depend	-0.060*	0.031
Years_BiZ	0.003	0.005
Savings	0.001*	0.006
Trust	-0.324*	0.190
Premium:	-	-
<i>Yearly</i>	0.471***	0.146
<i>Half yearly</i>	0.344*	0.195
<i>Quarterly</i>	0.694***	0.171
<i>Monthly</i>	0.444***	0.148
Creditaccess	-0.059	0.086
Income	0.019*	0.010
Constant	1.87***	0.436
Lambda(mills)	-0.599*	0.305
rho(ρ)	-0.708*	
sigma(σ)	0.845	
WaldChi2(17)	60.64***	
Observations	601	

* = significant at 10%; ** = significant at 5%; *** = significant at 1%.

Source: Computed from field survey data, (2014)

From Table 2 the log of amount willing to pay (*AmtWilling*) is explained by marital status (**Mari_Status**), financial literacy (**Fin_Lit**), and number of dependents (**Depend**). Also *AmtWilling* is explained by Savings, Trust, premium payment mode and income. Table 2 also shows that yearly, quarterly and monthly modes of premium payment for micro-insurance are statistically significant at 1% in influencing the amount a market operator is willing to pay for micro-insurance. Again, rho (ρ), which represents the correlation coefficient of ε and μ in equations (5) and (6) is also statistically significant at 10%. This is an

indication that selection bias existed in the data generation process and has been corrected.

It can also be explained from Table 2 that marital status (**Mari_Status**) has significant influence on the amount a market operator is willing to pay for micro-insurance. The coefficient of 0.409 shows that, being single increases the amount individuals are willing to pay for micro-insurance by 40.9% more compared to being a widowed. Again, the coefficient of married of 0.473 shows that being a marriage person increases the amount market operators are willing to pay for micro-insurance by 47.3% more compared to being a widowed. Similarly, the coefficient of divorced of 0.440 indicates that being separated from marriage increases the amount that individuals are willing to pay for micro-insurance on the average by 44% more compared to their counterparts in the widowed category.

The coefficient of financial literacy is 0.026, which is statistically significant at 5%. This means that an increase in financial literacy or financial knowledge increases the amount willing to pay for micro-insurance among the informal commercial market business operators all other things being equal. This is so because an improvement in one's financial literacy serves as conduit for thorough understanding of financial concepts and financial services, which in turn impact significantly on personal financial decision making, management and financial well-being. Understanding the importance of financial products and basic knowledge of principles underlying financial service utilization can persuade the individual to have the willingness to spend extra money to patronize such financial service. The finding from this study is in agreement with the assertion by

Lusardi and Mitchell (2007) and Lusardi (2008) and Khan and Ahmed (2013); that financial literacy-gap or lack of knowledge about certain basic financial concepts and principles constitute potential barrier to insurance market participation. This suggests that financial educational policy intervention programmes seeking to ensure participation in micro-insurance are likely to have expected impact when directed to target the informal market business operators in Ghana.

The number of dependents (**Depend**) has a coefficient of -0.060. This shows a negative association with amount willing to pay. So, as the number of dependents increases, amount willing to pay for micro-insurance decreases by all things being equal. This result validates that of Babatunde et al. (2012) and Kwadzo et al. (2013). Again, the coefficient of savings is given as 0.001 and statistically significant at 10%. Thus, an increase in savings by GH¢1.00 leads to increase in the amount willing to pay for micro-insurance by 0.10%. This finding confirms the result of Hulme et al. (2009) in the sense that access to savings can help the poor manage vulnerabilities through accumulated savings.

The coefficient of trust variable is given as -0.324; this indicates that trust and/or confidence in micro-insurance as a guarantee for future business safety during shock decreases the amount willing to pay for micro-insurance all things being equal. This finding confirms the result of Chowdhury et al. (2007) and Yusuf et al. (2009). This study has found out that Yearly, half yearly, quarterly and monthly premium payment modes have positive and significant effects on amount willing to pay for micro-insurance given their coefficients as 0.471, 0.344, 0.694

and 0.444 respectively. Thus respondents in the yearly premium paying mode category are willing to pay more compared with their counterparts in daily category; also respondents in the half yearly, quarterly and monthly are willing to pay more for micro-insurance compared with respondents in the daily premium payment mode category. This finding confirms that of Akotey et al. (2011).

Moreover, the coefficient of income is given as 0.019, which is positive and statistically significant at 10%. This indicates that, an increase in income by GH¢1.00 increases the amount willing to pay for micro-insurance by 1.9% more on the average, all things being equal. This finding is similar to that obtained by Dror et al. (2006).

Finally, Table 2 shows the diagnostic tests for the estimation exercise. These are captured in the coefficients of rho (ρ), sigma (σ) and lambda (λ) or 'selection hazard'. They are -0.708, 0.845 and -0.599, respectively, and they are all significant. Given the fact that rho (ρ), which is the correlation coefficient of ε and μ in equations (5) and (6) is significant; notice that $\rho\sigma = \lambda$. In fact, (ρ) determines whether or not selection bias exists; once (ρ) is significantly different from zero, it can then be concluded that selection bias existed in the sample but it has been corrected.

5. Conclusions and policy recommendations

The study sought to examine the effect of financial literacy on willingness to pay for micro-insurance among the informal commercial market business operators. Data was elicited from 612 market operators drawn from selected urban market centers in Ghana. Heckman's two-step estimation technique was employed to cater for the problem of sample selection bias. From the findings the conclusions of the study are that: Financial literacy has a positive effect on the amount informal commercial market business operators are willing to pay for micro-insurance in Ghana. Respondents in single, married and divorced categories have a higher willingness to pay for micro-insurance. Also number of dependents, savings and trust significantly explain willingness to pay for micro-insurance. Again premium payment flexibility increases willingness to pay for micro-insurance. Finally income increases the amount willing to pay for micro-insurance scheme among informal market business operators in Ghana.

The study recommends that providers of micro-insurance services should reach out by providing their targeted clientele financial education intervention programmes to improve upon their financial knowledge and increase participation in micro-insurance scheme. Also micro-insurance providers should ensure flexibility in micro-insurance premium payment to ensure participation of market operators in their schemes. Moreover, insurance providers should invest in building reputation by improving quality service delivery to boost confidence of the potential insuring public to subscribe to micro-insurance.

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APPENDICES

Appendix A

Table A: Definition and measurement of variables

Variable	Measurement
Sex	Sex of a respondent. A female dummy.
Age	Number of years of the respondent.
Mari_Status	Current Marital status of the respondent
Market Levy	Amount paid per month as market occupancy levy in cedis.

Fin_Lit	Respondent's level of financial knowledge. An index measure.
Depend	Number of dependents under the care of the respondent.
Years_Biz	A measure of number of years in the commercial market business.
Savings	The amount of savings balance owned by the respondent in cedis.
Trust	A dummy variable. A measure of a respondent's trust and confidence in micro-insurance contract.
Premium	A categorical variable. A measure of Mode of premium payment.
Creditaccess	A dummy variable. A measure of access to credit facility by a respondent.
Income	Monthly average income of a respondent in cedis.
AmtWilling	Natural log of amount willing to pay for micro-insurance.
WillPart	Willingness to participate in micro-insurance. Binary response variable (1/0)
Riskexper	A measure of the respondent's risk experience in business
Peer	A measure of Peer influence

Appendix B

Formula and determination of Sample size

$$SS = \frac{Z^2 \times p(1-p)}{C^2}$$

Where; SS = required sample size

Z = estimated confidence level

p = estimated prevalence of insurance participation

C = the margin of error

$$SS = \frac{1.96^2 \times 0.2(1-0.2)}{0.05^2}$$

$$SS = \frac{3.8416 \times 0.16}{0.0025}$$

$$SS = \frac{0.614656}{0.0025}$$

$SS = 245.8624 \sim 246$. Thus, the primary sample size was 246. To correct for differences in design, for cluster sample, in this survey, this primary sample size was multiplied by the design effect (D). Generally, researchers assume the design effect to be 2 for survey involving cluster sampling. Thus, $SS \times D = 246 \times 2 = 492$. The sample size was further increased by 5% to cater for contingencies emanating from non-response and/or possible recording error:

$SS+5\% = 492 \times 1.05 = 516.60 \sim 517$. An arbitrary 100 questionnaires were added thus, bringing the sample size to 617. To determine the number of observations to be sampled from each zone, the sample size was spread over the 3 zones from which the survey was conducted. Thus, $617 \div 3 = 205.66 \sim 206$. So, 206 questionnaires were sent to each zone, which were administered in the selected market centers. Thus, total questionnaires sent to the field were 618, and out of this, 6 respondents decline to be part of the interview. Therefore the total sample size used for the study was 612.

