Determinants of Demand for Microinsurance in Cameroon

Nana Djomo Jules Médard
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Ngouana Koudjou Serges Rodrigue

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By

Nana Djomo Jules Médard
University of Yaoundé II, Cameroon

and

Ngouana KoudjouSerges Rodrigue
National Institute of Statistics, Cameroon

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Abstract

This study aims at identifying the determinants of demand for microinsurance in Cameroon using a methodology based on the analytical framework proposed by Heckman (1979). These are counting models with double selection. First, a biprobit selection model is estimated to determine membership of an association on the one hand, and subscription to a microinsurance on the other. Second, interest models called counting models are estimated to identify and analyse the factors that affect the number of microinsurance policies. Data for the study are from the Fourth Cameroon Household Survey (ECAM4), a survey with national coverage conducted by the National Institute of Statistics (NIS) in 2014. The results make it possible to identify significant factors that are positively correlated with membership of an association and subscription to a microinsurance. These are mainly factors such as level of education, age squared and household size. Conversely, the results show that male gender and the age of the household head significantly and negatively influence membership and subscription. Furthermore, male gender, age squared, household size and insurance premium are positively related to the number of microinsurance policies purchased by household heads. Finally, age and level of education are negatively correlated with the number of microinsurance policies purchased. Furthermore, the inverse of the Mills ratio indicates that the number of microinsurance policies is negatively correlated with unobserved characteristics. In a context of poverty, these results call for a number of actions by public authorities to promote microinsurance as a way of achieving universal social security protection.

Keywords: Microinsurance, double selection, biprobit model, counting models, household

1.0 Introduction

According to Knight (1921), an economic actor faced with the problem of choice in an unspecified future may face either a risky or an uncertain situation. A risky situation is where the economic actor has a probability distribution related to the various contingencies in the future. Conversely, an uncertain situation is one where the actor does not have a probability distribution for the eventualities. Whether risky or uncertain, it is obvious that a situation of which the outcome cannot be determined beforehand can have disastrous repercussions for an individual's wealth. This calls for rational reflection on the strategies to be adopted in order to cushion the effects of negative shocks caused by unpredictable events. It is in response to this concern that insurance organizations were created. It is precisely in an economic environment plagued by uncertainty and risks that insurance is important. This importance is more pronounced in a context of widespread poverty where economic actors experience serious difficulties in coping with fluctuations in income. However, the low penetration rate of insurance in developing countries suggests, on the one hand, that products are unsuitable and, on the other hand, a lack of awareness of the stakes involved in covering risk.

Regarding awareness, it should be noted that concerns about risk and uncertainty are well integrated into the economic analysis of business actors in developing countries. People do not only live in the present, they analyse their past and formulate expectations about their future. In other words, they are aware of the shocks and crises to which they are exposed on a daily basis and try to integrate these eventualities into their economic calculations. However, because they do not know when these unfortunate events could occur, people feel vulnerable.

Vulnerability highlights the impact of risks and uncertainties on the well-being of these economic actors and calls for the development of protection or management mechanisms. In fact, the management of risks and uncertainties within poor populations is very often done in informal microinsurance groups little known by the regulations.

Microinsurance refers to small-scale insurance, which has its roots in under-banked countries where informal financial institutions and informal social protection mechanisms are predominant. Although these informal financial practices are mostly found in poor countries, it is worth noting that the vast majority of countries worldwide, even the most industrialized, have experienced at an earlier stage of their

development traditional savings, credit and microinsurance practices similar to those found in African countries (Lelart, 2002).

Built on mechanisms similar to those of formal insurance,[1] microinsurance has undergone remarkable development in recent years to compensate for the shortcomings of traditional insurance, particularly its inability to cover a wide geographical area and meet the challenges of universality. However, microinsurance is not simply a matter of lowering the price of traditional services in order to make them accessible to less well-off populations, but rather its capacity to develop its own solutions suitable for the target population both in terms of the needs to be covered and the resources available. In this regard, the BIT (2008) defines microinsurance as inclusive insurance whose main objective is to offer specific insurance products to a population that is currently excluded from the traditional system due to a lack of knowledge or financial resources. It enables these populations to benefit from insurance cover against various risks[2] based on premium payments tailored to their financial capacity.

In Africa, the provision of microinsurance products is provided by various entities: insurance companies in the formal sector, non-governmental organizations (NGOs), microfinance institutions (MFIs), cooperatives, mutual health insurance companies, community programmes, associations and other support groups. The African formal microinsurance market grew by 30% between 2011 and 2014; a sign of the vitality of the continent. Nevertheless, it should be noted that insurance penetration rate is less than 5% in this region. According to McCord and Biese (2015), in 2014, US$647 million (FCFA389 billion) worth of premiums were issued in Africa against US$387 million (FCFA232 billion) three years earlier. The weighted average loss of the providers represented only 26% in 2014 against 44% in 2011. These figures suggest that the development of microinsurance activity on the African continent is contributing to better risk management and a decrease in the number of insurance claims.

While it is true that life and credit microinsurance account for the majority of policies in Africa,[3] other formal microinsurance products are experiencing remarkable growth. For example, between 2011 and 2014, the number of people covered by health microinsurance grew by 562% from 1.2 million to 8.1 million; those covered by agricultural microinsurance and individual accident microinsurance grew in the same proportions (more than 500% growth), while the number of people covered by property microinsurance also increased sharply: 3.2 million people were insured in 2014 compared to only 800,000 in 2011 (+308%).

Formal microinsurance is particularly developed in Southern Africa and provides good insurance coverage in West Africa. It covers 64% of the South African population, 22% of the inhabitants of Zambia, 21% of people in Swaziland and 15% in

1 Protection of a natural or legal person against one or more risks in exchange for a premium.

2 Climate, health, anthropic and mechanical risks, risks of accident, illness or death, and commercial or financial risks.

3 42 and 16 million people, respectively, in 2014.

Namibia. Coverage rates are still low in other countries of the sub-region, but formal microinsurance is present in almost all of them in significant proportions. In West Africa, Ghana is the country with the highest formal microinsurance coverage: 30% of its population was covered in 2014. With 3.4%, 2.8% and 2.1% of their populations covered, respectively, Togo, Burkina Faso and Benin are far behind Ghana, but ahead of Senegal (1.1%) and Nigeria (1%).

In Central Africa, formal microinsurance is poorly developed: apart from Cameroon (1.8% coverage rate), DR Congo (0.4%) and Congo (0.1%), formal microinsurance seems to be non-existent in other countries of the sub-region. In North Africa, microinsurance is still in its infancy. The coverage rate is 2.2% in Tunisia, compared to 1.3% and 0.3% in Morocco and Egypt, respectively.

These statistics show that microinsurance has not developed to any great extent in most African countries. However, informal channels such as associations are the cornerstone of microinsurance in Africa, particularly in Cameroon. Indeed, the report of a study conducted by the NIS (2015) indicates that 37.7% of household heads in Cameroon are covered by informal microinsurance. The distribution, according to employment sector, shows that 69.4% of the insured people work in the informal sector compared to 16.3% in the formal sector. The inactive population represents 14.3% of subscribers. Looking at standard of living, the poor are in the majority, accounting for 85.5% of subscribers. Moreover, there is a higher uptake of insurance services in urban areas (56.2%) compared to rural areas (43.8%). These statistics illustrate, on the one hand, the strong presence of microinsurance in Cameroon and, on the other hand, the demand, which is essentially from urban populations and more from the poor.

The residential area and living conditions of stakeholders in the microinsurance market in Cameroon justify the need for this study in the context of alleviating poverty. That is why the objective of this paper is to identify the determinants of demand for microinsurance in Cameroon. Knowing the determinants of microinsurance could provide a basis for public authorities and development partners to develop and implement policies aimed at securing the livelihoods of vulnerable populations. The rest of the paper is structured as follows: Section 2 provides a brief analysis of microinsurance in Cameroon, Section 3 reviews the appropriate literature, Section 4 explains the methodological framework, Section 5 presents the data used in the study; Section 6 analyses the results, and Section 7 concludes.

2.0 Emergence of microinsurance in Cameroon

2.1 Cameroonian economy in brief

Cameroon is a Central African country with an estimated population of 22 million[4] and a demographic growth rate of 2.5% according to BUCREP (2005) projections. Its economy is fairly diversified and shows some resilience in an international context characterized by falling commodity prices and slower global growth. Despite the decline observed in 2016 in the growth of gross domestic product (GDP, 4.5% in 2016 against 5.7% in 2015 and 5.9% in 2014), the economy has shown an average growth rate of 5.2% over the past five years. On the supply side, growth is particularly driven by the tertiary sector whose average[5] growth in volume is 4.4%, while its average contribution to national growth is 2.3 points. Conversely, final consumption predominates on the demand side, accounting for nearly 80% of GDP employment. The large share of the tertiary sector in the Cameroonian economy illustrates a strong trend of entrepreneurship in the field of services, including insurance.

2.2 Social protection system

Cameroon's current social protection system is based on the social welfare system managed by the National Social Insurance Fund (NSIF) for the benefit of private sector workers and civil servants under the labour law, and on the state-run retirement pension scheme for civil servants and public agents not civil servants (contractual). The Cameroonian social protection system is distinguishable by its Bismarckian character, based on mandatory contributions (from employees and employers) based on salary. It provides for the management of social security by the persons concerned, the insured or their representatives (the state and social partners). It is a highly state-owned professional system, since the beneficiaries are largely civil servants. This system operates according to the logic of social insurance. The aim of this system is to protect workers against the risks of loss of income. Only workers who contribute receive social benefits. In other words, social security is paid for in Cameroon.

4 In 2016.

5 Average over the last five years (2012-2016 period).

According to the NIS (2017a), the International Labour Organization (ILO) identifies nine main social functions covered by social security, namely: unemployment, sickness, maternity, disability, death, family benefits, accidents at work, occupational disease and old age. Only diseases contracted outside of work and unemployment are not covered. The benefits provided by the NSIF include family benefits, old-age, disability and death benefits, and benefits for work-related accidents and illnesses. In 2016, 5,731 employers were enrolled, compared with 6,207 in 2015. This represents a regression rate of 7.7%. The number of active employers rose from 38,308 in 2015 to 38,444 in 2016. This represents an increase of 0.4%. Around 67,275 persons were registered as social security beneficiaries, i.e. a decrease of 3.87% compared with 2015, with a proportion of 72.34%, young workers under the age of 35 again having the highest number of registrations.

In 2016, 24,949 new applications for family benefits were submitted and 84.13% of those were settled. There was also an increase in the number of recipients, from 48,337 in 2015 to 56,612 in 2016, a 23.33% increase. As for old age, disability and death pension schemes, 8,106 applications were submitted and 87.39% were settled. Regarding occupational risk, 2,431 new applications were submitted, of which 44.68% were settled. The number of beneficiaries rose to 6,036, an increase of 29.08%. The income for insurance schemes in 2015 was generated from the old-age, disability and death pensions division (42%), the occupational risk division (17%) and the family benefits division (41%). In addition, as part of its mission to recover risks (social benefits), the NSIF spent over FCFA77 billion in 2015: FCFA7.9 billion on family benefits, about FCFA3.1 billion on occupational risks and FCFA66 billion for old age, disability and death pensions. Regarding labour standards, 12.2% of workers were victims of work-related accidents in 2010.

The social assistance and solidarity system is still residual due to lack of funding. Social assistance is partly provided by the ministry in charge of social affairs, which provides assistance to target populations such as children, the disabled, the elderly, indigenous people and vulnerable populations. The objective is to reduce poverty (Beveridgian objective). Family solidarity still plays an essential role in terms of assistance despite its shortcomings (income inequalities and lack of risk diversification) due to urbanization, individualization, wage growth and the modernization of society. Private, international and religious assistance is important, but remains devolved and poorly coordinated.

Additional social protection is provided by community insurance systems. The majority of these systems operate informally and are organized by the people themselves in the form of tontines in neighbourhoods or at village meetings, in particular for bereavement, illness and childbirth. Regarding social coverage, Cameroon is characterized by embryonic social protection with blocked extension. As a result, self-employed workers (such as doctors, lawyers, bailiffs, engineers, businessmen, entrepreneurs, traders, artisans, etc.) and those in the informal sector cannot benefit from social protection even though they represent 82.5% of the total number of workers in Cameroon.

2.3 Traditional insurance market

At the macroeconomic level, insurance services form part of the economic activity of a country. Banks and financial institutions[6] in Cameroon recorded a growth in volume of 5.2% in 2016 and contributed about 0.1 point to the growth of the national economy. According to the Ministry of Finance, during 2016, 26 companies operated in the Cameroonian insurance market: 16 in the non-life insurance segment "IARDT" and 10 in the "LIFE" insurance segment, including WAFA Assurance Vie (life insurance) and ACAM Vie (LIFE) insurance that entered the market in that year. Insurance companies and insurance agents as well as technical experts are the main players in this market. According to a report of the Association of Insurance Companies of Cameroon (ASAC, 2017), the insurance sector overall generated about FCFA197 billion in 2017, an increase of 6.1% compared to 2016, when about FCFA185.7 billion was generated. The distribution by sector largely highlights liability-related insurance, which represented about 69.5% of the market in 2017, a decrease compared to the previous year's 72%.

Non-life insurance policies posted a turnover of FCFA136.9 billion in 2017 against FCFA131.38 billion in 2016, an increase of 4.2%. An assessment of turnover by sector reveals that the Personal Accident and Illness sector, covering is 26.6%, generated FCFA36.4 billion in 2017, an increase of 16.1% compared to the previous year's FCFA31.36 billion. The Automobile sector recorded a turnover of FCFA47.1 billion in 2017 against FCFA48.1 billion in 2016, a decline of 2.1%. This sector continued to occupy a predominant place as it accounts for 34.4% of total property and casualty insurance (P&C) premiums. The Fire and Other Property Damage segment amounted to FCFA19.9 billion in 2017, an increase of 19.2% compared to the previous year when it stood at FCFA16.7 billion. The Fire segment accounted for 14.5% of the P&C turnover. The General Civil Liability segment recorded a turnover of FCFA5.2 billion in 2017, against FCFA4.1 billion in the previous year, an increase of 26.8%. This sector accounted for 3.8% of total P&C premiums. The Transport sector, which contributed 14.4% to the overall turnover of the P&C sector, saw its premiums drop from FCFA18.7 billion to FCFA17 billion in 2017, a decrease of 9.1%. The Other Direct Risks sector generated FCFA8.9 billion in 2017, down by 2.2% compared to 2016 when it stood at FCFA9.1 billion. It accounted for 7% of IARDT turnover (ASAC, 2017).

Claims settlement amounted to FCFA49.6 billion in 2017 against FCFA48.8 billion in 2016, an increase of 1.6%. The claims settlement rate, i.e. the ratio of benefits paid/claims payable, increased compared to that of the previous year, which stood at 56.8% in 2017, against 52.6% in the previous year, while the cost of claims for the year fell by 12.8% to FCFA47.9 billion against FCFA54.9 billion the previous year. The loss ratio (i.e. the ratio cost of claims/acquired premiums of the market) represents 36.5%, which is down compared to that of the previous year (42.6%) (ASAC, 2017).

6 INS (2017b), according to the classification for the publication of the national accounts of Cameroon (2016).

Life insurance posted a turnover of FCFA60.03 billion in 2017 against FCFA54.3 billion in 2016, which translates into an increase of 10.6%. It represented 30.5% of the market in 2017, against 28% in the two previous years. Out of a total of FCFA60.03 billion in 2017, 45% was for individual insurance and 55% for group insurance. The financial products for life insurance and capitalization increased by 45.45% and stood at FCFA6.4 billion in 2017, against FCFA4.4 billion in 2016. Paid benefits amounted to FCFA33.8 billion in 2017 against FCFA27.4 billion paid out in 2016, which represents an increase of 23.3%. At the same time, there was also an increase in the claims settlement rate, which stood at 17.4% against 20.6% in the previous year. The cost of life insurance claims increased by 12.4% and stood at FCFA44.5 billion in 2017 against FCFA39.6 billion the previous year. The loss ratio, i.e. the ratio of claim costs to premiums earned by the market, was 74.2% in 2017, an increase compared to that of the previous year (72.9%) (ASAC, 2017).

In a context where the penetration rate of insurance is low and the living conditions of the vast majority of households are deteriorating, microinsurance has emerged as an alternative to hedging the various risks that households in general, and the poor in particular, may face in their daily lives.

2.4 The microinsurance market

The BIT (2008) defines microinsurance as an insurance scheme primarily involving low premiums and/or low insured capital, by the facility of cover, underwriting, contract administration, claims reporting and victim compensation. It covers the various categories of life and non-life insurance. Non-life insurance covers things such as illness, crop and livestock losses, and accidents. Life insurance covers life, savings, death and capitalization. However, it does not cover liability insurance and specifically does not cover motor vehicle insurance. Furthermore, microinsurance can be taken out by individuals, legal entities (in the context of group insurance) and communities of persons with identical characteristics but without a legal personality. Several years after the adoption of the Regulation on Microinsurance, the provision of microinsurance contracts in the 14 CIMA member states is still low. According to a report published by the Development International Desjardins Group (2011), the penetration rate of microinsurance on the African continent was low; barely 2.6% of the target population (consisting of 32 countries) was covered.

Although some formal insurance companies are increasingly extending their services to the microinsurance segment (e.g. AXA-Cameroon, Activa and Allianz), it should be noted that microinsurance is essentially informal and therefore does not have a distinctive structure. Its structures vary according to the context, lifestyles, daily realities and types of problem that a group of individuals or people (the insured) face on a daily basis. Microinsurance is also used for joyous events such as the arrival of a new baby in the family or the marriage of a close relative. This is an obstacle to the development of microinsurance activities in formal insurance structures. Microinsurance in Cameroon is closely linked to informal finance and has its roots in

the development of the tontines, which had a particular boom in the western part of the country following the crisis of the 1990s. Initially, tontines were interest-free, revolving loans among a group of people. Over time, they evolved to take the form of associations and, in addition, a microinsurance component was added to strengthen not only the bonds of solidarity between members, but also to share certain individual risks among the members of the group. This is why microinsurance is practised mainly within associations.[7]

As far as the functioning of microinsurance systems is concerned, there are two major variants in Cameroon. In the first case, each member of an association is required to pay a minimum contribution into a fund known as a "caisse secours" (relief fund), which is set up to deal with a set of very specific catastrophes or events. When a disaster or event admissible to the fund occurs, the legality of the claimant is ascertained and then, if appropriate, they are granted a sum of money predetermined according to the type of catastrophe. In the second case there is no relief fund, but rather amounts to be contributed by members in the event of a catastrophe. These resources are then collected and paid to the affected person.

Microinsurance in Cameroon offers a wide range of products. Tchouassi et al (2015) list seven of them: detailed commodity insurance, funeral insurance, group insurance, credit insurance, life insurance, health insurance and risk insurance. This is a typology resulting from a specific survey designed by the authors to meet the requirements of their study. However, it should be noted that this classification presents some confusion in that it does not always allow the reader to clearly differentiate the content of the products. For example, the "group insurance" product appears to be cross-cutting and would affect other types of insurance to a greater or lesser extent. Furthermore, this classification focuses on the microinsurance service offer as expressed by the formal structures (insurance companies and microfinance institutions). However, the bulk (over 90%) of microinsurance services in developing countries, and in Cameroon in particular, are offered within informal organizations such as associations. These associations are the foundation of microinsurance and their diversity should be taken into account when identifying microinsurance products.

Based on the International Classification of Non-profit Organizations (ICNPO) recommended by the United Nations (2003), the ECAM4 survey classifies associations into six main groups according to the main activity or reason for the establishment of the association. Annex 1 presents each of these groups and their characteristics, as well as the insurance products associated with each.

7 These associations fall under the institutional sector of non-profit organizations (NPOs) in the framework of national accounting.

3.0 Literature review

In recent years, there has been a remarkable increase in research on microinsurance markets (Biener and Eling, 2012). Nevertheless, many questions remain unanswered, particularly those relating to the factors that influence the demand for microinsurance services.

According to Outreville (2013), four main types of factors can influence the demand for insurance: i) economic factors (such as price, income/wealth and access to credit); ii) sociocultural factors (characteristics of utility functions); iii) structural factors (market structure), and iv) personal and demographic factors (for example, age, gender, education and household size). Based on empirical research, these factors can be used to explain the functioning of the microinsurance market.

3.1 Economic factors

According to standard economic theory, the price of a typical good is inversely proportional to the demand for that good (or service) (Eling et al, 2014). In light of this relationship, Cole et al (2013) reveal a significant sensitivity of price to the demand for insurance in India. Specifically, the authors show that the price elasticity of insurance services is between 1.04 and 1.16, indicating that a 10% drop in the price of insurance services leads to an increase in demand for risk coverage in a range of 10.4% to 11.6%. Mobarak and Rosenzweig (2012) note that a 50% drop in prices relative to the actual price increases the probability of underwriting by 17.6 percentage points, suggesting a sufficiently modest price elasticity estimated at 0.44. This low-price elasticity evokes curiosity and is consistent with the work of Karlan et al (2012), who found that curiosity is related to the sensitivity of demand to price and calls for assessing the influence of reducing the price of microinsurance on demand. In this vein, Cole et al (2013) observe that when prices are significantly lower than actual fair prices, less than half of farm households secure insurance against rainfall.

In a study conducted in Kenya, Obura (2014) establishes a correlation between product pricing and the demand for microinsurance. Product pricing appears to be a major factor here, contributing to the uptake of microinsurance products. In addition to pricing, the author highlights the issue of market segmentation and points out that the ability of a microinsurance company to increase its client base also depends on its ability to address the needs of the target audience.

Compared to conventional (traditional) insurance, microinsurance has relatively low premiums. Also, the premium associated with a claims cost tends to be lower for microinsurance than for similar, traditional insurance policies because of the effect of fixed costs on premium setting. Although premiums are “low” in the microinsurance market, the costs associated with the time and effort required to purchase (or renew) policies and process claims can be high for the target population.

In addition to price, wealth is seen as an economic factor influencing the demand for microinsurance. However, the wealth effect in the microinsurance market appears to be different from the wealth effect in the traditional market. In the traditional insurance market, there are people who have considerable wealth compared to people in microinsurance providers. However, wealth increases with the potential risks of wealth decline. The presence of greater potential losses then leads to a high propensity to buy insurance policies. Conversely, in the microinsurance market, policy holders are characterized by relatively modest wealth, so much so that wealth is perceived more as a measure of access to credit. Clearly, there does not seem to be a consensus on the impact (positive or negative) of access to credit on the demand for microinsurance. Households that do not have access to credit have less ability to cushion their wealth in the event of a shock and are therefore forced to place greater value on microinsurance to reduce income volatility (Giné et al, 2008). This suggests a negative effect of access to credit on the demand for microinsurance. Gollier's (2003) theoretical model supports this reasoning. Conversely, there is evidence that households without access to credit may not have sufficient funds to purchase insurance. This has a positive effect on demand for microinsurance.

3.2 Social and cultural factors

Contrary to predictions of the anticipated utility theory, studies on microinsurance markets show a negative correlation between risk aversion and demand. Risk aversion is generally measured using experimental models where individuals choose between safe and risky options with varying expected outcomes and variances (Binswanger, 1981; Holt and Laury, 2002). Giné et al (2008) and Cole et al (2013) in a study on insurance against rainfall in India, Kouame and Komenan (2012) in a study on harvest insurance in Côte d'Ivoire, and Giesbert et al (2011) in their work on life microinsurance in Ghana, found that more risk-averse households are less likely to buy insurance. It may be that the development of the microinsurance framework is helping to understand the relationship between risk aversion and a decision to buy insurance from traditional markets.

Furthermore, many empirical studies highlight the importance of trust in the decision-making process. Qualitative surveys suggest that lack of trust in the management of the system is a reason for withdrawal or non-participation in a programme (Dong et al, 2009; Basaza et al, 2008), but on the basis of quantitative responses Giné et al (2008) note that trust to the insurance provider is a key determinant of demand for insurance against rainfall in India. Similarly, Cole et al

(2013) found that households in India do not fully trust or understand insurance, and that their demand is 36% higher when there is a recommended (i.e. trusted) insurance educator involved in the purchasing process. Cai et al (2009) and Zhang et al (2014) found that lack of trust in government-subsidized insurance schemes in China is a significant barrier to participation. Likewise, Basaza et al (2008) realized that lack of trust is an important reason for the low uptake of community-based health insurance schemes in Uganda. However, according to Patt et al (2009), three levels of trust can be discerned: trust in the product itself, trust in the institution, and the degree of interpersonal trust between insurance agents.

In addition, religion is sometimes associated with risk attitudes as well as a sense of cohesion within a community. A related factor, fatalism, is the extent to which individuals view events/occurrences as being beyond their control. Gheyssens and Gunther (2012) point out that those with a strong faith tend to rely more on God, leading to increased risk-taking. In India, fatalism is associated with greater use of insurance, but the study does not specifically evaluate the demand for insurance (Cole et al, 2011). Cole et al (2013) also examined the effects of group affiliation through advertising and found that such affiliations affect the demand for insurance.

3.3 Structural factors

Informal risk-sharing networks play an important role in risk management in developing countries (Fafchamps and Lund, 2003; Morduch, 1999). In addition, the level of informal risk-sharing in a social network can have a significant impact on the demand for formal risk-sharing mechanisms such as insurance. Jowett (2003) observes that people living in highly interconnected communities in Vietnam are much less likely to purchase public health insurance. The results suggest that strong informal networks can displace or undermine government interventions.

The issue of crowding out formal and informal insurance mechanisms is important for the development of the microinsurance market. Although there are informal systems that work well, caution should be exercised in introducing insurance schemes that could be perceived as alternatives. Developing a better understanding of the factors that promote the success and prevent the failure of informal systems will make future microinsurance efforts more sustainable. Landmann et al (2012), for example, observe that formal insurance displaces solidarity. Therefore, a better understanding of the context is paramount to the success of microinsurance, both as an enterprise and as a means of providing social value.

However, De Allegri et al (2006) suggest that the decision to subscribe to a community health insurance scheme in rural West Africa is closely correlated with the quality of the health centre. Basaza et al (2008) show that poor quality health care in Uganda is an important reason for individuals not subscribing to insurance schemes. Dong et al (2009) observe that, alongside health needs and demands, quality of care is an important factor that contributes to withdrawal from an insurance scheme. Jehu-Appiah et al (2011) show that the behaviours of health care providers are important for

households to decide whether to join the national health insurance scheme in Ghana. Similarly, Nguyen and Knowles (2010) found that the demand for health insurance in Vietnam increases significantly with the expected benefits of insurance, measured by distance and quality of care at a provincial hospital.

Thus, a high probability of using microinsurance depends on past shocks (Arun et al, 2012). However, Galarza and Carter (2010) and Cole et al (2013) found no relationship between the two. Studies in advanced economies show that individuals are likely to contribute to an insurance policy after experiencing a loss, which corresponds to the preference for accessibility (Johnson et al, 1993).

3.4 Personal and demographic factors

Age does not appear to be clearly related to clients' propensity to purchase personal health or group insurance. In different contexts, older people are both more likely (Gaurav et al, 2011; Cole et al, 2011; Cao and Zhang, 2012; Chen et al, 2013; Dercon et al, 2011), and less likely (Giné et al, 2008; Cole et al, 2011) to purchase insurance compared to younger people. However, Arun et al (2012) observe that beyond a certain age, households headed by older persons are more likely to obtain life insurance, possibly as there is a higher incentive: to protect their family in the event of death. Indeed, they found that underwriting is positively associated with a greater number of young people who are heads of their households. This suggests that participation may be motivated by the desire to leave a legacy to the family, and similar tests seem appropriate for the microinsurance market.

There is mixed reaction when it comes to determining how gender affects the likelihood of buying insurance. While Jehu-Appiah et al (2011) find that women are more likely to purchase insurance, Bonan et al (2012) and Schneider and Diop (2004) show a higher uptake rate among men. Furthermore, Banthia et al (2009) highlight the risks to which women are particularly vulnerable and thus emphasize the potential for microinsurance to address these gender-specific risks. However, it should also be noted that the evidence on women's participation in microinsurance is varied. Studies show that female-headed households are both more likely (Chankova et al, 2008; Nguyen and Knowles, 2010) or less likely (Bonan et al, 2012; De Allegri et al, 2006) to take out an insurance policy than male-headed households.

With regard to education, various empirical studies suggest that the higher the number of years of schooling, the more likely it is to belong in an insurance system (Jowett, 2003; Schneider and Diop, 2004; Akter et al, 2008; Giné and Yang, 2009; Jehu-Appiah et al, 2011). This is consistent with the idea that better educated people may have a clearer understanding of insurance products and are therefore more likely to purchase them. Specifically, Giesbert et al (2011) noted that education can stimulate demand by increasing financial literacy, and the effect of education on demand may disappear when financial literacy is limited. For this reason, neither Bonan et al (2012) nor Giné et al (2008) found a significant impact on insurance scheme uptake based on the number of years spent in school. Gaurav et al (2011) find a counter-intuitive

relationship between education and financial literacy as measured by responses to specific questions about interest rates, inflation and risk diversification. According to their results, education is irrelevant in predicting financial literacy. The authors also provide evidence that low levels of financial literacy among respondents reduces the likelihood of purchasing an insurance policy against rainfall.

Schneider and Diop (2004) show that location, education, gender, household size and distance from a healthcare facility are significant factors in the uptake of community-based health microinsurance products. In addition, Bhat and Jain (2006) analysed the factors driving the demand for private health microinsurance using a two-stage model. The first model identifies the factors that would affect decisions to purchase insurance, while the second model estimates the factors that would affect the amount spent on purchasing insurance. In a similar vein, Giesbert et al (2011) find that risk aversion, vaccination, risk perception, age, non-land assets, remittances, education and location are important factors explaining the uptake of voluntary micro-life insurance. Their model, based on a household survey, includes gender, illness, property value, dependents, marital status, employer/employee and risk experience, but they were not significant.

4.0 Methodology

The objective of this research is to identify the determinants of demand for microinsurance. To achieve this, we will conduct an analysis on the demand for microinsurance based on the diversification of the risk management portfolio.

4.1 Theoretical model for insurance demand

Studies on the insurance demand for an isolated risk uses the same basic model below, with a few variations. In this model, the individual has initial wealth W of which the amount is assumed to be known (not a random variable). This individual faces a risk represented by damage of random amount A. The individual can insure themself against this risk, either comprehensively or partially. He must, therefore, choose a percentage of coverage α $(0 \leq \alpha \leq 1)$, i.e. apply for insurance. If P $(\alpha,$ A) represents the insurance premium, then the individual's final wealth is the random variable R defined by:

$$R = W - P(\alpha, A) - (1 - \alpha)A \quad (1)$$

When the individual chooses comprehensive insurance (α= 1), their final wealth becomes certain. We then have:

$$R = W - P(\alpha, A) \quad (2)$$

Generally, researchers assume that the insurance premium is calculated based on the mathematical assumption of the benefits that the insurer will have to pay, i.e. $\alpha E(A)$. This basic premium is "loaded" using a coefficient η $(\eta > 0)$, which reflects the costs borne by the insurance company and the risk benefits due to the investor as covered by the insurance company. The insurance premium is therefore written as follows:

$$P(\alpha, A) = (1 + \eta)\alpha E(A) \quad (3)$$

If $\eta = 0$, the insurance premium is said to be "equitable" (actuarially fair). Using Equation 2, the individual's final wealth is thus rewritten as:

$$R = W - (1 + \eta)\alpha E(A) - (1 - \alpha)A \quad (4)$$

The issue is then to determine: (i) what is the individual's preferred level of α? and (ii) How does this level change when one of the parameters of the model is modified?

Of the studies that have used this basic model, a distinction must be made between two major groups: (i) those that use the Bernoulli principle as the basic reference framework for individual decisions with uncertainty, and (ii) those that examine how outcomes are changed when the Bernoulli principle is discarded in favour of more frustrated criteria for decision-making with uncertainty.

The principle of maximizing the utility probability was proposed by Daniel Bernoulli as early as 1738 (Bernoulli, 1738). It was updated and formulated as a theorem by Von Neumann and Morgenstern in 1947. These authors established that individuals who are consistent in their choices behave under uncertainty as if they were maximizing the mathematical probability of a cardinal index of satisfaction by using their subjective probabilities of the different states of nature that can be envisaged. This principle is now the foundation of all economic theory of risk and uncertainty and has therefore been used to rigorously analyse individual insurance demand behaviour. The most prominent work in this regard is by Friedman and Savage (1948), Arrow (1963, 1974), Mossin (1968) and Ehrlich and Becker (1972).

Theorists of the decision presented below have proposed numerous rules of behaviour that could challenge Bernoulli's principle. The most recent of these are the product of ambitious efforts to formulate a theory of behaviour based on uncertainty that is more general than that developed by Von Neumann and Morgenstern (1947) (see ahneman and Tversky, 1979; and Loomes and Sugden, 1982). Others are more rudimentary: they are based on a simple principle that can be applied to individuals and groups of individuals who cannot, or will not, use probability measures in their decision-making process. These older rules are: Savage's minimax regret criterion, the Hurwicz's rule, the minimax rule, and the maximin rule. These are the only rules that have so far been applied to the insurance demand problem.

These approaches are clearly highly contrasted. However, it should be stressed that they have one thing in common: in each of them, the analytical framework is restricted to a single insurable risk. At no point are multiple sources of risk and the individual's asset portfolio mentioned. This simplification may seem strange as modern financial theory for the past 20 years or so has been constantly concerned with portfolio choices and the co-variance phenomena between the returns on assets making up the portfolios. According to Mayers and Smith (1983), most studies of optimal insurance demand have made two (often implicit) assumptions. The first assumes that there is only one source of uncertainty affecting the individual's situation.

The second (a corollary of the first) is that there is only one way to hedge against this source of uncertainty: insurance. However, if we refer to a Fama and Miller (1972) world, where capital markets are absolutely perfect (absence of taxes and transaction costs, perfect information, and perfectly negotiable and divisible assets), insurance as an institution disappears because it becomes perfectly useless.

In such an ideal world, individuals can sell, issue and buy debt securities on any asset (including human capital) and thus diversify their portfolios. In this way, they can eliminate the so-called diversifiable risk (as opposed to systematic risk or market risk), which is in fact nothing more than insurable risk. This satisfaction is expressed through a utility function. The same explanation remains valid for the choice that an individual makes when there is a fixed number of alternatives. Thus, individuals maximize their utility conditional on the set of characteristics of all the options available to them. The individual's utility is represented here by a linear function. It depends on the characteristics of the individual, the household to which they belong and the environment. Their choice will also depend on the nature of the alternatives. Among the unavoidable characteristics of the individual is their income. In fact, an individual's income represents the biggest constraint they must satisfy in order to maximize their utility. The demand for insurance also depends on the price to be paid to be insured: the monetary cost and all non-monetary costs, and the requirements to subscribe to an insurance contract or to have access to the benefits of the contract. The price that guides the individual in choosing an insurance policy is the price perceived and not the price set by the provider. This price depends on the benefits that the agent identifies for each insurance mechanisms comparatively to others. Based on all these considerations, and drawing on the work of Sossou and Gbere (2003), this study uses a reduced form for the utility function for insurance demand. The reduced form of the individual's utility function can be written as follows:

$$U_{in} = f(S_n, Z_{in}, \Phi) + \Psi_{in} = X_n \Phi_i + \Psi in \quad (5)$$

where U_{in} represents the utility if individual n chooses alternative i, given the information available at the time of their choice. Xn is the vector of the observable characteristics of the individual and alternative i and Φ represents the vector of the parameters for which the function is defined. It is assumed that the error terms (Ψin) are independently and identically distributed with an average of zero.

In a process of decision choice, the aim of the decision is to find a better solution among the possible alternatives to fulfil the objectives. In reality, there are two types of choices: the first is continuous choice, in which a combination of the quantity of possible alternatives is chosen where the quantities for each alternative can vary continuously. The second type is discontinuous (discrete) choice where only one of several alternatives is chosen, such as whether or not to belong to an association or whether or not to purchase microinsurance. The probit function and counting model in the next section follows this approach.

4.2 Econometric model

Diversification of the risk management portfolio in this study refers to the fact that an individual may hold several microinsurance policies to cope with the diverse risks to which they are exposed on a daily basis. This is a common practice that is due not only to the diversity of risks, but also to the nature of the risks. Furthermore, in traditional microeconomic theory, demand for a good (or service) is the expression of the quantity demanded in relation to the price. From this point of view, considering household demand for microinsurance is like looking at the number of microinsurance policies held by households, or even heads of households. The econometric estimation of this type of relationship, where the dependent variable reflects a number of events, is usually carried out using econometric models known as counting models.

However, looking at the available data structure, having microinsurance policies involves two choices. The first is to be a member of an association. The second is to have a microinsurance policy within an association. Indeed, in the Cameroonian household survey (ECAM4), which will serve as the database for this study, microinsurance is captured within associations. This makes sense, because in Cameroon, the bulk of microinsurance policies are offered within associations, which would absorb more than 95% of the demand for microinsurance. Moreover, the most visible objective of almost all associations is to assist a member in need or experiencing a joyful event (Stocks-Smith, 2012). Therefore, the study focuses on the subscription to microinsurance within associations.

In this respect, the methodological framework has two major aspects: first, we will present the bivariate probit model, which captures the subscription to a microinsurance policy based on membership of an association. Second, we will look at the counting models that explain the number of microinsurance policies held by household heads. In addition, the bivariate probit model requires consideration of two potential selection biases.

4.2.1 The bivariate probit model and double selection

The decision to join an association is not a random one. At the very least, there is no assurance that the distribution of individuals who join an association is identical to that of individuals who do not. To this end, it is likely that a number of observable and/or unobservable characteristics are exclusively related to individuals who choose to join an association. For example, individuals who join an association may be motivated by collective behaviour of turning individual concerns into collective concerns. This would negatively affect the econometric results. In order to avoid this inconvenience, consideration is given to taking into account a selection bias associated with membership of an association. This bias is called membership bias.

Similarly, the choice to adopt a microinsurance by the members of an association is also not made randomly. Indeed, there is likely to be a selection bias, known as

subscription bias, related to the fact that we observe the number of microinsurance policies only for people who have purchased microinsurance. In other words, it is likely that the individuals who purchased microinsurance had different observable and/or non-observable characteristics from those who did not purchase microinsurance, which would bias the results. This is the case, for example, if one considers that individuals who wish to have insurance coverage for various risks choose to have one or more microinsurance policies. It is, therefore, accepted that there are observable and non-observable socioeconomic characteristics that would influence the choice of individuals to own or not to own microinsurance, and would affect their behaviour in holding one or more microinsurance policies. Following the work of Heckman (1979), these selection biases can be taken into account by introducing additional explanatory variables, such as the inverses of the Mills ratios, into models describing the number of microinsurance policies. This proposed solution makes it possible to correct for the fact that the dependent variable is only observed for a part of the sample.

To control the selection bias relating to membership of an association and the subscription bias of microinsurance, we consider a bivariate probit model. First, the determinants of membership of an association are highlighted, and second, the effect of membership on participation in microinsurance is investigated. We therefore consider the following set of equations:

$$\begin{cases} Ass_i^* = \alpha X_i' + u_i \\ Mic_i^* = \beta Y_i' + v_i \end{cases} \begin{cases} Ass_i^* = \alpha X_i' + u_i \\ Mic_i^* = \beta Y_i' + v_i \end{cases} \quad (6)$$

Where Ass_i^* and Mic_i^* are latent variables that influence the probability of being in an association and the probability of purchasing microinsurance, respectively. X and Y are vectors of individual characteristics and u and vs are error terms. In this respect, Assi* and Mici*, respectively, represent the reasons that motivate a head of family to belong to an association and to purchase a microinsurance policy. It is obvious that an individual joins an association and subscribes to a microinsurance policy if the profit they make from the association and the microinsurance policy is greater than what they lose if they do not join and subscribe to it. This is because it is a rational choice that an individual makes in the face of the many choices available to them. Note that Assi* and Mici* are latent variables and cannot be observed. Only the following dichotomous variables can be represented as follows:

$$Ass_i = \begin{cases} 1 \; si \; Ass_i^* > 0 \\ 0 \; otherwise \end{cases} \qquad Ass_i = \begin{cases} 1 \; si \; Ass_i^* > 0 \\ 0 \; otherwise \end{cases} \quad (7)$$

$$Mic_i = \begin{cases} 1 \; si \; Mic_i^* > 0 \\ 0 \; otherwise \end{cases} \qquad Mic_i = \begin{cases} 1 \; si \; Mic_i^* > 0 \\ 0 \; otherwise \end{cases} \quad (8)$$

Where $Ass_i = 1$ indicates whether the individual is a member of an association and $Ass_i = 0$ otherwise. $Mic_i = 1$ indicates whether the individual has subscribed to microinsurance and $Mic_i = 0$ otherwise.

The estimation process of the bivariate probit model using the set of equations 6 requires some clarification. Indeed, these are two econometric equations whose error terms can be correlated. Theoretically, two cases are therefore possible: $\rho = 0$ and $\rho_{uv} \neq 0$, where ρ_{uv} shows the correlation between the error vectors $u_i u_i$ and $v_i v_i$. Where $\rho_{uv} \neq 0$, there is good reason to lean towards a bivariate probit model. Conversely, where $(\rho_{uv} = 0)$, the bivariate probit model option is not necessary.

In practice, we usually assume a non-zero correlation between the error terms and then, following the estimates, an appropriate test is conducted to confirm or deny the correlation between these errors. If the correlation between the errors is not confirmed the bivariate probit model is inappropriate, and it is therefore preferable to estimate the two equations separately. In addition, it is accepted that the errors follow standard laws. Maximum likelihood estimates provide a correction term called the inverse of the Mills ratio. This correction term relates to microinsurance and is based on the bivariate probit model defined above, taking into account the fact that the choice of a microinsurance policy is dependent on membership of an association. This is then inserted into the counting models to capture selection bias.

4.2.2 Counting models

The study examines the demand for microinsurance as reflected in the number of microinsurance policies held by heads of household. This is a discrete variable with non-negative values that can be estimated by counting models. There are four variants: Poisson model, Negative binomial model, Zero-inflated Poisson model (ZIP) and Zero-inflated negative binomial model (ZINB).

Poisson Model. In the Poisson model, it is assumed that the endogenous variable, namely the number of microinsurance policies held by individuals (denoted by zi), follows a Poisson law. The probability of an individual owning z microinsurance policies is therefore:

$$Prob\ (z_i = z) = \frac{e^{-\lambda_i}\lambda_i^z}{y!};\ \ z \in N,\ \lambda_i > 0,\ i = 1, 2, \ldots, n \qquad (9)$$

Where λ is a defined parameter such that $E(z_i) = Var(z_i) = \lambda$. This parameter is correlated to p exogenous variables by the log-linear form.

$$Log\,\lambda_i = h_i\gamma\ ;\ i = 1,2, \ldots, n Log\,\lambda_i = h_i\gamma\ ;\ i = 1,2, \ldots, n \qquad (10)$$

Where h_i is a vector (1, p) associated with the parameter vector γ (p, 1). The choice of the log-linear specification is mainly explained by the need to have positive λ_i parameters. The advantages of this functional form are similar to those of the usual econometric regression model, in particular:

$$E(z_i/h_i) = \lambda_i = e^{h_i\gamma} <=> LogE(z_i/h_i) = h_i\gamma \quad (11)$$

γ is interpreted as an elasticity when the exogenous variables are in logarithmic form. However, unlike traditional log-linear models, γ is not the elasticity of the endogenous variable, but of its mathematical probability. For a sample, the Poisson counting model can be estimated by the non-linear least squares method or by the maximum likelihood method.

Negative Binomial Model. Some authors have found the assumption that $E(z_i/h_i) = Var(z_i/h_i) = \lambda_i E(z_i/h_i) = Var(z_i/h_i) = \lambda_i$ to be unrealistic, that is, dependent on hi, the observation variance cannot vary independently from its average. To overcome this handicap, tests for oversampling (the variance greater than the average) as well as alternative tests have been proposed. The model most often used is the negative binomial regression model introduced by Haussman et al (1984). In this modelling, it is assumed that zi still follows a Poisson law but its mathematical probability is marked by an error term noted as εi. The latter reflects various errors in the model, such as the omission of the independent explanatory variables of hi, or the non-observable heterogeneity that often characterizes individual data. zi thus follows a Poisson law of parameter:

$$\mu_i = e^{(h_i\gamma+\varepsilon_i)} = \lambda_i e^{\varepsilon_i} \mu_i = e^{(h_i\gamma+\varepsilon_i)} = \lambda_i e^{\varepsilon_i} \quad (12)$$

With $e^{\varepsilon_i} = \eta_i e^{\varepsilon_i} = \eta_i$. Dependent on h_i and η_i, the distribution of z_i is a Poisson law defined by:

$$Prob\ (z_i = z/h_i, \eta_i) = \frac{e^{-\lambda_i\eta_i}(\lambda_i\eta_i)^z}{y!} Prob\ (z_i = z/h_i, \eta_i) = \frac{e^{-\lambda_i\eta_i}(\lambda_i\eta_i)^z}{y!} \quad (13)$$

We make the assumption that η_i follows gamma law $\Omega(\delta, \delta), \delta > 0$ of density $g(\eta_i)$, of probability $E(\eta_i) = 1$, without losing generality as long as h_i has a constant term and constant variance $Var(\eta_i) = 1/\delta$. The results lead to the fact that z_i / h_i follows a negative binomial parameter law (λ_i, δ).

The negative binomial regression model can be estimated by the maximum likelihood method. The Poisson model is tested by the zero hypothesis H_0: $\delta=0$ using either the Wald statistic, the likelihood ratio test, or the Lagrange multiplier test (Greene, 2000).

ZIP and ZINB Models. Cragg (1971) developed different models in cases where, for an endogenous variable, an event (such as the purchase of a good or the notification of a loss) may or may not occur, as in the Tobit model (Tobin, 1958). If the incident does not occur, the endogenous variable is assigned a value of zero, which is assumed to be continuous and with positive values. The decision-making process is represented by a probit model and the second event (purchase amount or claim amount) is represented by a standard regression model. Referring to the actual data, it is possible that some heads of a household belonging to an association may not have subscribed to a microinsurance policy. In this case, the endogenous variable (z) corresponding to the number of microinsurance policies may contain zero values.

A standard model of Poisson or binomial negative model does not distinguish between these groups. A ZIP or ZINB model generates two separate models and then combines them. These models, developed by Lambert (1992) and Greene (1994), do not assume that zero and strictly positive values are generated by the same process. Compared to the previous simple models, it is therefore assumed that the observed random variable z is the product of a binary law B and a Poisson law (ZIP model), or a negative binomial law (ZINB model):

$$Z = BZ^* \tag{14}$$

The unobserved random variable B is modelled by a probit regression to estimate the probability that $z_i = 0$. For a member i, $b_i = 0$ if the member does not have a microinsurance policy and $b_i = 1$ if the member has a microinsurance policy. The random variable Z* corresponds to the Poisson model (or the negative binomial model) and is used to predict the value of Z for microinsured ($b_i = 1$). This equation estimates the probability of z_i.

The ZIP and ZINB models thus have two parts: the counting model part (for Z*, which accounts for the number of policies for microinsured persons) and the zero inflation (probit) part, which explains the probability of non-microinsured persons. More precisely, for a ZIP model we note that for q_i the probability of $b_i = 0$ (no microinsurance policies) and λ_i the Poisson law parameter for the number of policies, which depends, as previously stated, on the explanatory variables in Equation 10. The distribution density of Z is therefore written as:

$$Prob\ (Z = 0/h_i) = q_i + (1 - q_i)e^{-\lambda_i}\ avec\ q_i = \frac{\exp(h_i'\gamma)}{1+\exp(h_i'\gamma)} \tag{15}$$

And for z_i not zero, we find:

$$Prob\ (Z = z_i/h_i) = (1 - q_i)e^{\lambda_i}\frac{\lambda_i^{z_i}}{z_i!} Prob\ (Z = z_i/h_i) = (1 - q_i)e^{\lambda_i}\frac{\lambda_i^{z_i}}{z_i!} \tag{16}$$

The probability of the number of policies conditionally to $b_i = 1$ is equal to the non-conditional probability of the unobserved variable z_i^*. For a ZINB model, the probability is then given in comparison to Equation 13.

However, the use of the ZIP and ZINB models requires the presence of a large number of members in the portfolio without a microinsurance policy covering the study period (one year). The number of zeros on the randomized variable for the number of policies must be significant. In this case, the numbers are low with regard to the number of members who hold at least one microinsurance policy. Table 1 shows that out of a total of 4,482 association members, only 13.39% do not have a microinsurance policy against 54.22% members who are holders of a microinsurance policy. This illustrates the inconsistency in the use of the ZIP and ZINB models. Whichever it is, the econometric results will allow us to better appreciate the use of these models.

Table 1: Frequency of microinsurance policies

Number of policies	Frequency	Percentage	Cumulative percentage
0	600	13.39	13.39
1	2430	54.22	67.60
2	1280	28.56	96.16
3	127	2.83	99.00
4	27	0.60	99.60
5	16	0.36	99.96
6	1	0.02	99.98
8	1	0.02	100.00
Total	4482	100.00	

Source: Authors, from ECAM4 data.

5.0 Data source and estimation procedures

Data source and choice of variables

The database for this study originates from the fourth Cameroonian Household Survey (ECAM4), produced by the National Institute of Statistics (INS) in 2014. The survey has national coverage and was conducted on a sample of 10,303 household heads, comprising 5,464 households in urban areas and 4,839 households in rural areas.

We will use different variables that will provide information on economic, social and cultural, structural, personal and demographic characteristics in order to determine the probability of belonging to an association and the likelihood of adopting a microinsurance scheme. Some of these variables are qualitative in nature, while others are quantitative. Table 2 summarizes the descriptive statistics for the quantitative variables and Annex 2 presents descriptive statistics for the qualitative variables.

Variables that could explain membership of an association and subscription to a microinsurance scheme are: gender, age and education level of the household head, number of dependents in the family, marital status of the household head, religion of the household head and the household's residential area.

Variables that may explain the number of policies held are: the gender, age and education level of the household head, the number of dependents in the family, the contributions made towards the microinsurance premium, and the inverse Mills ratio. It should also be noted that the number of microinsurance policies held by an individual is obtained by counting the number of associations in which he or she has subscribed to a microinsurance policy. A microinsurance policy represents a package of products offered by an association, as detailed in Annex 1. It should be noted that associations in general offer a more-or-less similar package of products. Members are therefore required to subscribe to them in accordance with the conditions laid down in advance and to pay for the insurance premiums, which constitute the relief fund.

Table 2: Statistical summary of quantitative variables

Variable	Observation	Average	Standard deviation	Minimum	Maximum
Microinsurance premium	10303	17422.22	34933.74	0	1178000
Age of household head	10303	43.32601	15.52011	12	95 and more
Size of household	10303	4.473454	3.117178	1	30
Inverse of Mills ratio	10303	.9351751	.8352895	0	2.941752
Number of policies	10303	.5409104	.8010444	0	8

Source: Authors, from ECAM4 data.
Note: The number of observations is relative to the number of household heads.

In Table 2, the number of observations, 10,303, represents the total number of household heads. Of this number, 4,482 represents the number of household heads belonging to an association. Among the 4,482 household heads, 3,882 households heads have subscribed to a microinsurance policy. This means that there are 600 household heads who belong to an association and who have not subscribed to a microinsurance policy. In addition, the number of microinsurance policies is between 0 and 8. But according to Table 1, 54.22% of household heads belonging to an association have a microinsurance policy. This would justify the presence of a wide disparity in insurance premiums around the average value. It can also be noted that some subscribers contribute FCFA1178,000 per year, while others contribute only FCFA1,000. However, the average annual contribution of subscribers is FCFA40,970.

Some families have up to 30 members, while others have only one person. On average, there are four members per family. However, family size is widely dispersed around the average. The youngest household heads are 12 years old, while the oldest ones are aged 95 and above. The average age is 43 years. However, the ages are spread quite widely around the average, indicating that the age groups are generational. Also, it should be noted that in Cameroon, succession traditions sometimes grant the youngest member of the family the responsibility of being the household head, which explains why the sample has household heads who are 12 years old.

5.1 Estimation procedure

For the estimation procedure, we follow an extension of the two-step method proposed by Heckman (1979) for the estimation of these equations. In stage one, the bivariate probit model is estimated by the maximum likelihood method. Its estimation makes it possible to calculate the selection term μi. In the second step, the equation on the number of microinsurance policies is estimated by the non-linear least squares method or the maximum likelihood method by including the correction term as an additional variable. The coefficient of this selection term captures the effect of the correlation between the error terms in the estimation of the selection processes

and the number of microinsurance policies. Estimation of this new equation on the number of microinsurance policies then allows us to obtain unbiased estimates from the coefficients.

First, to ensure the identification of the bivariate probit model we should have $\rho_{uv} \neq 0$. Of course, if $\rho_{uv} = 0$ the bivariate probit model is inappropriate and it is therefore more sensible to estimate the two equations separately. Second, it is also necessary to have variables that are assumed to influence the demand for membership in an association and the adoption of a microinsurance, but not the number of microinsurance policies.

6.0 Results and discussion

6.1 Analysis of determinants of membership and subscription

In this study, the equations of the biprobit model are regressed to identify the determinants of membership in an association and subscription to microinsurance. These determinants are provided in Table 3. The results of Wald's test show the relevance of the analysis to be conducted.

Table 3: Determinants of membership and subscription

Variables	Association		Microinsurance	
	Coefficients	Standard errors	Coefficients	Standard errors
Male	-0.290***	(0.0436)	-0.255***	(0.0432)
Age of household head	-2.854***	(0.481)	-2.958***	(0.551)
Age squared	0.940***	(0.112)	0.940***	(0.119)
Size of household	0.105*	(0.0617)	0.0761	(0.0596)
Level of education				
Primary	10.12***	(0.447)	2.300***	(0.0466)
Secondary	9.799***	(0.391)	2.237***	(0.0589)
Higher	9.705***	(0.369)	2.168***	(0.0942)
Without education	Ref. (.)		Ref. (.)	
Matrimonial regime				
Monogamous	0.128**	(0.0627)	0.124**	(0.0493)
Polygamous	0.242***	(0.0842)	0.221***	(0.0680)
Widower	0.191**	(0.0746)	0.243***	(0.0705)
Divorced	-0.154	(0.102)	-0.0468	(0.0933)
Cohabitation	0.196***	(0.0695)	0.186***	(0.0651)
Single	Ref. (.)		Ref. (.)	
Religion of household head				
Catholic	0.408***	(0.0430)	0.414***	(0.0417)
Protestant	0.359***	(0.0399)	0.383***	(0.0425)
Christian	0.263***	(0.0617)	0.111	(0.0714)
Other	0.320***	(0.0645)	0.334***	(0.0688)
Muslim	Ref. (.)		Ref. (.)	
Area of residence				
Urban	-0.000997	(0.0380)	-0.00362	(0.0412)
Semi-urban	0.185***	(0.0563)	0.175***	(0.0551)
Rural	Ref. (.)		Ref. (.)	
Constant	-6.936***	(0.628)	-7.044***	(0.654)
Observations		10,303		
Wald chi2 (36)		18386.25***		
Pseudo-likelihood log		-4858.202		
LR test for rho = 0 chi2(1)		4377***		

Source: Authors, from ECAM4 data.
Notes: Parameters were estimated using the SURE method.
The option "Robust" was chosen to correct the heteroskedasticity.
Ref. (.) means modality for reference and therefore cannot have an estimated coefficient.
*** p<0.01, **p<0.05, * p<0.1.

However, the results showing marginal effects in Table 4, derived from Table 3, will thus guide the analysis. Therefore Table 4 presents the results for household heads who are members of an association who have subscribed to a microinsurance policy. It is therefore appropriate for the analysis to focus on microinsurance.

Table 4: Marginal effects of determinants of membership and subscription

Variables	Delta Dy/dx method	Standard errors
Male	-0.0533***	(0.00930)
Age of household head	-0.619***	(0.113)
Age squared	0.197***	(0.0246)
Size of household	0.0159	(0.0125)
Level of education		
Primary	0.484***	(0.0506)
Secondary	0.470***	(0.0512)
Higher	0.456***	(0.0525)
Without education	Ref. (.)	
Matrimonial regime		
Monogamous	0.0260**	(0.0103)
Polygamous	0.0462***	(0.0142)
Widower	0.0507***	(0.0146)
Divorced	-0.00982	(0.0198)
Cohabitation	0.0390***	(0.0136)
Single	Ref. (.)	
Religion of household head		
Catholic	0.0866***	(0.00830)
Protestant	0.0802***	(0.00882)
Christian	0.0232	(0.0148)
Other	0.0698***	(0.0137)
Muslim	Ref. (.)	
Area of residence		
Urban	-0.000757	(0.00862)
Semi-urban	0.0367***	(0.0115)
Rural	Ref. (.)	
Observations	10,303	

Source: Authors, from ECAM4 data.
Notes: The Stata command used is: Margins, dydx (_all) post. Expression: Pr(association=1, microinsurance=1).
Ref. (.) means the reference modality and therefore cannot have an estimated coefficient.
*** p<0.01, ** p<0.05, * p<0.1.

The male gender variable reveals a significant and negative effect on the decision to purchase microinsurance. Compared to women, men have less than 0.05 preference points for microinsurance. Research shows that female-headed households are more likely to subscribe to microinsurance products (Chankova et al, 2008; Nguyen and Knowles, 2010). It would appear that women experience more financial difficulties and face more problems than men. Their only way to protect themselves against uncertain risks is to turn to microinsurance. Similarly, age has a significant and negative influence on the demand for microinsurance. It is less than 62% likely that older people will take out microinsurance compared to younger people. However, the long-term effect captured by age squared indicates that older people purchase more microinsurance products than younger people. The results of other studies are contradictory. Chen et al (2013) found that older people are more likely, while Cole et al (2011) showed that they are less likely to buy insurance policies compared to younger people.

The level of education has a positive effect on the demand for microinsurance. A household head with a higher level of education is 46% more likely to subscribe to a microinsurance product compared to a household headed by someone with no education. It should, therefore, be noted that those who did not attend school are less likely to subscribe to microinsurance products than those who attended school. Again, the results of previous studies (Giné and Yang, 2009; Jehu-Appiah et al, 2011) support the positive impact of education on the demand for microinsurance.

Families headed by single parents are less inclined to join a microinsurance scheme than those headed by a couple. For example, monogamous and polygamous people are 3% and 5%, respectively, more likely to subscribe to microinsurance schemes than single people. This is again a simple cost-benefit calculation. Single people are less likely than others to protect themselves against uncertain events. Also, Christians and animists as well as members of other religious denominations are more inclined to purchase microinsurance products than Muslims. More than 9% and 8%, respectively, of Catholics and Protestants expressed a desire to take out a microinsurance policy, comparatively to Muslims. However, Gheyssens and Gunther (2012) show that religion is a barrier to the demand for microinsurance. Moreover, living in semi-urban areas increases the likelihood of heads of households taking out a microinsurance product by 4% compared to heads of households living in rural areas. Generally speaking, it is the least well-off households that live on the outskirts of urban areas. The way they protect themselves against risks is by taking out a microinsurance policy.

Finally, the term (ρ_{uv} = 0.99 ≈ 1) is significant and positive. It represents the correlation coefficient between the residuals of each of the two equations in the biprobit model. It is statistically and significantly different from 0 at the 1% threshold. It confirms the fact that adoption is potentially determined simultaneously with membership and, at the same time, confirms the use of the methods that can control this bias. The sign is expected to be positive because it reveals a positive correlation. This means that household heads who are more likely to purchase microinsurance than can be explained by their observable characteristics are more likely to join an

association. The next step is, therefore, to correct the selection bias by introducing the inverse of the Mills ratio into the counting models.

6.2 Analysis of determinants of number of microinsurance policies

The results of the counting models are given in Tables 5 and 6. It should be noted that the alpha coefficients indicating the over-dispersion lean towards zero. As such, it can be concluded that the variances based on the explanatory variables are equal to the averages under the same conditions. The models to be considered for the analysis of the results are the Poisson model and the ZIP model. However, the results of the Poisson model are much better than those of the ZIP model (Table 6). This can be explained by the non-predominance of zeros among the elements of the dependent variable.

This being the case, young people hold more microinsurance policies compared to older people. However, age squared positively affects subscription to microinsurance policies. Older people are more likely to feel the need to hold a policy because of the high benefit expectancy. Conversely, although men tend to be less likely to own a microinsurance policy, it should nevertheless be pointed out that they have more capacity to purchase microinsurance policies than women. Baye et al (2016) show that in Cameroon, women suffer from income inequality compared to men. This may explain the fact that women are less likely to have microinsurance policies than men.

However, level of education negatively influences the number of microinsurance policies purchased. In other words, household heads with less education hold more microinsurance policies than those with higher education. More often, those with higher levels of education benefit from the traditional insurance products available at the organizations where they work. This tends to reduce their demand for microinsurance policies. Those with no education, or for those with a low level of education notably at the primary level, generally work in the informal sector or in organizations where they do not benefit from any formal insurance scheme and microinsurance is, therefore, their preferred method to protect themselves against risks. This finding is supported by Schneider and Diop (2004) who found that education is an explanatory factor in the demand for microinsurance.

Table 5: Determinants of number of policies from Poisson and NBREG model regressions

Variables	Poisson	Negative binomial
Male	0.175*** (0.0196)	0.175*** (0.0196)
Age of household head	-1.278*** (0.396)	-1.278*** (0.396)
Age squared	0.230** (0.0898)	0.230** (0.0898)
Size of household	0.402*** (0.0322)	0.402*** (0.0322)
Level of education		
Primary	-0.181* (0.0997)	-0.181* (0.0997)
Secondary	-0.216** (0.101)	-0.216** (0.101)
Higher	-0.312*** (0.105)	-0.312*** (0.105)
Without education	Ref. (.)	Ref. (.)
Microinsurance premium	0.256*** (0.0153)	0.256*** (0.0153)
Inverse of Mills ratio	-0.185*** (0.0713)	-0.185*** (0.0713)
Constant	-3.700*** (0.509)	-3.700*** (0.509)
/ln alpha		-24.68212
Alpha (over-sampling)		1.91e-11
Observations	4,482	4,482
Likelihood-pseudo log	-5433.7834	-5433.7834
Pseudo R2	0.0388	0.0388
Wald chi2(9)	836.66***	836.66***

Source: Authors, from ECAM4 data.
Notes: The option "Robust" was chosen to correct heteroskedasticity.
Standard errors are in parentheses.
Ref. (.) means the reference modality and therefore cannot have an estimated coefficient.
*** p<0.01, ** p<0.05, * p<0.1.

As suggested by the previous results, the size of the household is statistically and positively correlated with holding of microinsurance policies. Larger households have more policies than smaller households. Although a higher participation of larger households is observed (Musango et al, 2004; Dubois, 2002), this is mainly due to their higher level of income. Conversely, other studies mention the greater difficulty for large households to participate, for example, in a health risk mutual benefit insurance scheme (Basaza et al, 2008; Criel and Waelkens, 2003). Although these families are not considered to be among the poorest in the community, they are generally unable to pay the contributions for all their household members (Criel and Waelkens, 2003).

The policy premium also has a significant and positive influence on the purchase of microinsurance policies. Logically, a higher policy demand corresponds to higher premiums. In this respect, and contrary to traditional insurance which is money-based, we find that microinsurance has a cultural dimension. Several studies, such as those by Karlan et al (2012) and Cole et al (2013), have pointed out that the demand for microinsurance is not subject to price.

Finally, the inverse of the Mills ratio has a significant and negative effect on the counting equations. These results indicate that the number of microinsurance policies held by household heads is negatively correlated with unobserved characteristics.

Table 6: Determinants of number of policies from ZIP and ZINB models

Variables	ZIP model	Standard errors	ZINB model	Standard errors
Male	0.211***	(0.0153)	0.211***	(0.0153)
Age of household head	-0.412	(0.303)	-0.412	(0.303)
Age squared	0.0541	(0.0687)	0.0541	(0.0687)
Size of household	0.409***	(0.0272)	0.409***	(0.0272)
Level of education				
Primary	-0.208***	(0.0738)	-0.208***	(0.0738)
Secondary	-0.208***	(0.0753)	-0.208***	(0.0753)
Higher	-0.259***	(0.0779)	-0.259***	(0.0779)
Without education	Ref. (.)		Ref. (.)	
Microinsurance premium	0.192***	(0.0164)	0.192***	(0.0164)
Inverse of Mills ratio	-0.172***	(0.0513)	-0.172***	(0.0513)
Constant	-2.006***	(0.386)	-2.006***	(0.386)
/in alpha			-104.5176***	
alpha (over-sampling)			4.06e-46	
Inflated: number of policies	-53.69***	(0.0468)	-93.87***	(0.0468)
Constant	26.40***	(0.0428)	45.79***	(0.0428)
Observations	4,482		4,482	
Non-zero observations	3,882		3,882	
Zero observations	600		600	
Likelihood pseudo-log	-4723.181		-4723.181	
Wald chi2(9)	1104.16***		1104.17***	

Source: Authors, from ECAM4 data.
Notes: The option “Robust” was chosen to correct heteroskedasticity.
Standard errors are in parentheses.
Ref. (.) means the reference modality and therefore cannot have an estimated coefficient.
*** p<0.01, ** p<0.05,* p<0.1.

7.0 Conclusion

The purpose of this paper was to identify the determinants of demand for microinsurance policies in Cameroon. To achieve this, a literature review on microinsurance was conducted, and based on this review a methodology was adopted. A two-stage selection model was used to produce the econometric results. Data from the fourth Cameroonian household survey (ECAM4) were used in this study.

The results were discussed in three parts. First, the regression results from the bivariate probit model, which highlighted the determinants of demand for membership in an association and for adoption of a microinsurance. At this stage, several significant factors were identified that are positively correlated with membership as well as adoption. These are mainly factors such as level of education, age squared and household size. However, other variables have significantly and negatively impacted the membership demand and adoption demand. These include male gender and age of the household head. In addition to these variables, the amenity parameters regarding membership of an association (i.e. the reason for belonging to an association) were also found to be significantly positive on the demand for adoption. Finally, Wald's test on the correlation of errors highlighted the requirement for carrying out a joint regression of the two demand equations.

Second, regressions from the counting models were used to identify the variables that affect the number of microinsurance policy. By examining the over-dispersion compared to the average, the Poisson model was chosen. The statistically significant parameters indicate that the variables of male gender, age squared, household size and insurance premium are positively linked to the number of microinsurance policies held by household heads. On the other hand, age and level of education are negatively correlated to the number of microinsurance policies. Similarly, the inverse of the Mills ratio indicates that the number of microinsurance policies is negatively correlated to unobserved characteristics.

These results highlight the limitations of the current social protection policy in Cameroon. The social protection policy is clearly geared towards the financial participation of private companies for their employees or the civil servants, excluding the unemployed and those employed in the informal sector. Moreover, a current initiative by the government, which aims to enable other segments of the population to benefit from the universal social security protection scheme, seems unrealistic in view of growing impoverishment. Moreover, insurance schemes and the products available in the formal sector are not adequately suited to local realities. A few private

initiatives for the provision of microinsurance products so exist, but they are still not suited to local realities and, therefore, attract very few people.

Therefore, the only way that the government can promote social protection is by putting in place a mechanism that provides a range of microinsurance products tailored specifically to the needs of the poor. In order to do this, it should take a closer look at the realities of the associations on the ground, understand how they operate, and understand the issues that motivate their members, given the fact that microinsurance is more focused in these associations.

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Annex 1:Microinsurance Products and Mode of Operation according to Nature of Associations in Cameroon

Group of associations according to ECAM4	Title	Association name/ intended objective	Examples	Mode of operation	Microinsurance products
Group 1	Education, training, health and social services	Promotion of education, health and basic social services	Dschang Classical High School Parents' Association	▪ Brings together parents of high school students, listing the problems hindering their children's education in the school, and setting up individual contributions in order to have the necessary funding to solve the problems identified. ▪ Offers opportunities for members with good standing to benefit from school loans at preferential interest rates so that the beneficiaries can finance their children's education. At the start of the school year, depending on the surplus generated by the contingency fund, the association may decide to grant substantial or subsidiary aid to help parents pay for their children's school fees and required school items. The amount is granted according to the number of children per household.	School insurance (NB: In the absence of such an association, the quality of education for high school students would lower. Thus, parents' individual contributions can be seen as insurance premiums to cater for the quality of their children's education.)
			Mutual health insurance for residents of the Bachowa district in Yaoundé	▪ Members contribute a sum of money that is deposited in a fund to finance the health needs of its members. This is a mutual health insurance scheme for members' health-related problems. ▪ In case of illness, the member of the mutual insurance company benefits from certain prerogatives defined in their statutes in order to help the sick person. It is in this sense that the mutual insurance company directly finances the health concerns of its members.	Health insurance
			Mutual health insurance for tax department workers	▪ On the basis of members' contributions, the mutual insurance company provides them with a set of facilities to support them in the event of unfortunate or joyous events that require significant expenditure (illness, funeral, burial, marriage and birth). In addition to promoting solidarity among members, their rights within the structure are equally protected.	Health insurance Insurance for funeral (funeral and burial expenses), wedding, and childbirth expenses

from Jiangsu Province, China". BMC Health Services Research, 14: 185–96.

Group of associations according to ECAM4	Title	Association name/ intended objective	Examples	Mode of operation	Microinsurance products
				▪ An example is the death of a member of the mutual insurance company or of one of their family members (spouse, children). The mutual insurance company will intervene and help the family of the deceased, either by purchasing a coffin and related costs (such as mortuary fees, hearse and wreaths), or provide snacks/light meals during the mourning period.	
Group 2	Economic development, work and production of goods	Protection of workers' rights, promotion of economic activities and tackling factors detrimental to the economic activity of members of the group	Balessing Village Association of Motorcycle Taxi Riders	The motorcycle taxi riders of the Balessing village association meet daily in the home of one of the members and at each meeting they make contributions that are deposited in a fund dedicated to responding to social and financial problems that a member may face (such as illness, death of a relative, marriage or birth). The fund is also used to fight against police harassment of which they are often victims.	Health insurance and funeral insurance (funeral and burial expenses) Insurance for wedding expenses Insurance for childbirth expenses Work insurance
			Women in Solidarity from the Balepipi district	The women of the Balepipi district in western Cameroon formed an association called the "Femmes Solidaires" (Women in Solidarity). The group assists members of the association in the event of difficulties that could lead to a failure in performance in their field of work. If a woman gives birth, falls ill or is incapacitated in any way, the other women of the association lend a hand in her field of work. Note that in the conduct of their business, farmers are very vulnerable to risks relating to illness and physical injury.	Agri-business insurance
Group 3	Culture, sport and leisure	Promotion of sport, culture or leisure activities	DEUX-ZERO association of Biyemassi	The youth of the Biyemassi neighbourhood who wish to practice sports on a daily basis get together to better organize their sporting activity, which contributes to maintaining their physical health. Beyond sporting activities, solidarity is promoted among	Health insurance Insurance for funeral (funeral and burial

Group of associations according to ECAM4	Title	Association name/ intended objective	Examples	Mode of operation	Microinsurance products
Group 1	Education, training, health and social services	Promotion of education, health and basic social services	Dschang Classical High School Parents' Association	▪ Brings together parents of high school students, listing the problems hindering their children's education in the school, and setting up individual contributions in order to have the necessary funding to solve the problems identified. ▪ Offers opportunities for members with good standing to benefit from school loans at preferential interest rates so that the beneficiaries can finance their children's education. At the start of the school year, depending on the surplus generated by the contingency fund, the association may decide to grant substantial or subsidiary aid to help parents pay for their children's school fees and required school items. The amount is granted according to the number of children per household.	School insurance (NB: In the absence of such an association, the quality of education for high school students would lower. Thus, parents' individual contributions can be seen as insurance premiums to cater for the quality of their children's education.)
			Mutual health insurance for residents of the Bachowa district in Yaoundé	▪ Members contribute a sum of money that is deposited in a fund to finance the health needs of its members. This is a mutual health insurance scheme for members' health-related problems. ▪ In case of illness, the member of the mutual insurance company benefits from certain prerogatives defined in their statutes in order to help the sick person. It is in this sense that the mutual insurance company directly finances the health concerns of its members.	Health insurance
			Mutual health insurance for tax department workers	▪ On the basis of members' contributions, the mutual insurance company provides them with a set of facilities to support them in the event of unfortunate or joyous events that require significant expenditure (illness, funeral, burial, marriage and birth). In addition to promoting solidarity among members, their rights within the structure are equally protected.	Health insurance Insurance for funeral (funeral and burial expenses), wedding, and childbirth expenses

Annex 2: Statistics of qualitative variables

Table A2.1: Summary statistics forqualitative variables

Qualitative variables	Frequency	Percentage	Cumulative percentage
Member of an association = no	5821	56,50	56,50
Member of an association = yes	4482	43,50	100,00
Total	10303	100,00	
To subscribe to microinsurance = no	6421	62,32	62,32
To subscribe to microinsurance = yes	3882	37,68	100,00
Total	10303	100,00	
Without education = no	9514	92,34	92,34
Without education = yes	789	7,66	100,00
Total	10303	100,00	
With primary education = no	8660	84,05	84,05
With primary education = yes	1643	15,95	100,00
Total	10303	100,00	
With secondary education = no	9172	89,02	89,02
With secondary education = yes	1131	10,98	100,00
Total	10303	100,00	
With higher education = no	9916	96,24	96,24
With higher education = yes	387	3,76	100,00
Total	10303	100,00	
Is satisfied with association = no	6063	58,85	58,85
Is satisfied with association = yes	4240	41,15	100,00
Total	10303	100,00	
Is monogamous = no	5522	53,60	53,60
Is monogamous = yes	4781	46,40	100,00
Total	10303	100,00	
Is polygamous = no	9433	91,56	91,56
Is polygamous = yes	870	8,44	100,00
Total	10303	100,00	
Is widower = no	9015	87,50	87,50
Is widower = yes	1288	12,50	100,00
Total	10303	100,00	
Is divorced = no	9846	95,56	95,56
Is divorced = yes	457	4,44	100,00
Total	10303	100,00	
Cohabits = no	9610	93,27	93,27
Cohabits = yes	693	6,73	100,00
Total	10303	100,00	

Is single = no	8094	78,56	78,56
Is single = yes	2209	21,44	100,00
Total	10303	100,00	
Is poor = no	2272	22,05	22,05
Is poor = yes	8031	77,95	100,00
Total	10303	100,00	
Is male = no	2980	28,92	28,92
Is male = yes	7323	71,08	100,00
Total	10303	100,00	
Is Catholic = no	6305	61,20	61,20
Is Catholic = yes	3998	38,80	100,00
Total	10303	100,00	
Is Protestant = no	7633	74,09	74,09
Is Protestant = yes	2670	25,91	100,00
Total	10303	100,00	
Is Christian = no	9612	93,29	93,29
Is Christian = yes	691	6,71	100,00
Total	10303	100,00	
Is Muslim = no	8165	79,25	79,25
Is Muslim = yes	2138	20,75	100,00
Total	10303	100,00	
Is member of other religion = no	9497	92,18	92,18
Is member of other religion = yes	806	7,82	100,00
Total	10303	100,00	
Lives in urban area = no	4839	46,97	46,97
Lives in urban area = yes	5464	53,03	100,00
Total	10303	100,00	
Lives in semi-urban area = no	9086	88,19	88,19
Lives in semi-urban area = yes	1217	11,81	100,00
Total	10303	100,00	
Lives in rural area = no	6681	64,85	64,85
Lives in rural area = yes	3622	35,15	100,00
Total	10303	100,00	
Informal activity = no	7187	69,76	69,76
Informal activity = yes	3116	30,24	100,00
Total	10303	100,00	

Mission

To strengthen local capacity for conducting independent, rigorous inquiry into the problems facing the management of economies in sub-Saharan Africa.

The mission rests on two basic premises: that development is more likely to occur where there is sustained sound management of the economy, and that such management is more likely to happen where there is an active, well-informed group of locally based professional economists to conduct policy-relevant research.

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Contact Us
African Economic Research Consortium
Consortium pour la Recherche Economique en Afrique
Middle East Bank Towers,
3rd Floor, Jakaya Kikwete Road
Nairobi 00200, Kenya
Tel: +254 (0) 20 273 4150
communications@aercafrica.org