# THE IMPACT OF MICROINSURANCE ON HOUSEHOLD WELFARE IN GHANA

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# Declaration

By submitting this dissertation, I, Joseph Oscar Akotey, declare that the entirety of the work contained therein is my own, original work, that I am the owner of the copyright thereof (unless to the extent explicitly otherwise stated) and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

J.O. Akotey 31 January 2015

# Dedication

With great gratitude to the Almighty God, I dedicate this work to my lovely wife, Anita and my beautiful daughter, Josepha.

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# Abstract

Microinsurance services have been operating in Ghana for the last decade, but the question whether they have enhanced the welfare of low-income households, mostly in the informal sector, is largely unresearched. In particular the study asks: does microinsurance improve the welfare of households through asset retention, consumption smoothing and inequality reduction? This question has been examined through the use of the 2010 FINSCOPE survey which contains in-depth information on 3 642 households across the rural and urban settings of the country. In order to control for selection bias and endogeneity bias, Heckman sample selection, instrumental variable and treatment effect models were employed for the evaluation. The results of the assessment have been compiled into four empirical essays.

The first essay investigates the impact of microinsurance on household asset accumulation. The findings show that microinsurance has a positive welfare impact in terms of household asset accumulation. This suggests that microinsurance prevents asset pawning and liquidation of essential household assets at 'give away' prices. By absorbing the risk of low-income households, insurance equips them to cope effectively with risk, empowers them to escape poverty and sustains the welfare gains achieved.

The second essay examines the impact of microinsurance on consumption smoothing. It delves into the capacity of microinsurance to enable households to avoid costly risk-coping methods which are detrimental to health and well-being. The results reveal that insured households are less likely to reduce the daily intake of meals, which is an indication that microinsurance is a better option for managing consumption smoothing among low-income households.

The third essay investigates the effect of microinsurance on households' asset inequality. The findings indicate that the asset inequality of insured households is less than that of uninsured households. Insured female-headed households have much lower asset inequality than male-headed households, but uninsured female-headed households are worse off than both uninsured and insured male-headed households. The regional trend reveals that developmental gaps impede the capacity of microinsurance to bridge the asset inequality gap.

The fourth essay asks: Does microcredit improve the well-being of low-income households in the absence of microinsurance? The findings show a weak influence of microcredit on household welfare. However households using microcredit in combination with microinsurance derive significant gains in terms of welfare improvement. Microcredit may be good, but its real benefits to the poor is best realised if the poverty trapping risks are covered with microinsurance. To this extent, combining microcredit with microinsurance will empower the poor to make a sustainable

exit from poverty. The findings of this thesis have pertinent policy implications for the government, the development community and stakeholders in the insurance industry. Microinsurance is a good instrument for improving the welfare of households and thus this research recommends its integration into the poverty reduction strategy of Ghana and a greater insurance inclusion for the lower end of the market.

**Key words:** Microinsurance; Welfare; Asset, Households; Ghana

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# List of acronyms and abbreviations

| | |
|---|---|
| AfDB | African Development Bank |
| AST | Asset Index |
| AYII | Area Yield Index Insurance |
| BECE | Basic Education Certificate Examinations |
| BOG | Bank of Ghana |
| CBOs | Community Based Organizations |
| CSB | Complaints and Settlements Bureau |
| Death_B'winner | Death of a Bread Winner |
| EDU | Education |
| FAO | Food and Agriculture Organization |
| FNGOs | Financial Non-governmental Organizations |
| G.MI | Government Microinsurance |
| GAIP | Ghana Agricultural Insurance Program |
| GCSCA | Ghana Cooperative Susu Collectors Association |
| GDHS | Ghana Demographic and Health Survey |
| GDP | Gross Domestic Product |
| Ghana Re | Ghana Reinsurance Organization |
| GHS | Ghanaian Cedi |
| GIA | Ghana Insurers Association |
| GIGA | German Institute of Global and Area Studies |
| GIZ | Gesellschaft für Internationale Zusammenarbeit |
| GLICO | Gemini Life Insurance Company |
| GLSS | Ghana Living Standard Surveys |
| GMet | Ghana Meteorological Agency |
| GNA | Ghana News Agency |
| GSS | Ghana Statistical Service |
| HH.Size | Household Size |
| HH_Credit | Households using Microcredit |
| HH_No_Credit | Households without Microcredit |
| ID Card | Identity Card |
| IFAD | International Fund for Agricultural Development |
| ILO | International Labour Organization |
| INSURED HH | Insured Households |
| IV | Instrumental Variable |
| Kno'dge_Insurance | Knowledge of Insurance |

| | |
|---|---|
| LEAP | Livelihood Empowerment Against Poverty |
| MCA | Multiple Correspondence Analysis |
| MDGs | Millennium Development Goals |
| MFIs | Microfinance Institutions |
| MSLC | Middle School Leaving Certificate |
| NGOs | Non-governmental Organizations |
| NHIA | National Health Insurance Authority |
| NHIS | National Health Insurance Scheme |
| NIC | National Insurance Commission |
| P.MI | Private Microinsurance |
| PCA | Principal Component Analysis |
| PIH | Permanent Income Hypothesis |
| PKSF | Bangladesh Rural Employment Support Foundation |
| PNDC | Provisional National Defence Council |
| PPP | Public Private Partnership |
| Proxim_Fin_Inst | Proximity to Financial Institutions |
| RCBs | Rural and Community Banks |
| Require_Fin_Inst | Requirement of Financial Institutions |
| ROSCAs | Rotating, Savings and Credit Associations |
| SAT | Sinapi Aba Trust |
| SIC | State Insurance Corporation |
| SIDBI | Small Industries Development Bank of India |
| SLCs | Savings and Loans Companies |
| SMEs | Small and Medium-sized Enterprises |
| SSNIT | Social Security and National Insurance Trust |
| TMU | Technical Management Unit |
| UKAid | United Kingdom Agency for International Development |
| UN | United Nations |
| UNDP | United Nations Development Programme |
| UNINSURED HH | Uninsured Households |
| USA | United States of America |
| USAID | United States Agency for International Development |
| VAT | Value Added Tax |
| WDI | World Development Indicators |
| WELF | Welfare |

# CHAPTER 1
# INTRODUCTION

## 1.1. BACKGROUND OF THE STUDY

Exposure to risks such as fire, floods, sickness, disability and death of a breadwinner can have adverse effect on the welfare of an entire household[1]. Again, bad weather conditions (eg. severe drought) and lack of a ready market for the produce of smallholder farmers impact negatively on the capacity of rural households to deal with poverty traps. These risks do not only impede the economic capacity of the poor from breaking the vicious cycle of poverty (Guha-Khasnobis & Ahuja, 2004), but they also reinforce households' vulnerability to income shocks in an escalating downward spiral (Churchill, 2007).

Indeed the failure of most sub-Saharan Africa countries to reduce extreme poverty by half as stipulated by the Millennium Development Goals (MDGs) has largely been attributed to uninsured risks (Loewe, 2006). The International Labour Organization (ILO, 2014) has also estimated that 75 countries do not have any social protection for households and that in developing countries 18 000 children die daily mainly due to lack of sufficient social protection. So can microinsurance be used to address such life-cycle and business risks associated with low-income households and enhance their standard of living?

The theoretical framework based on Von Neumann and Morgenstern (1944) expected utility theory indicates that microinsurance may reduce vulnerability as low-income households replace the uncertainty of incurring huge losses with the certainty of making small, regular premium payments (Brown & Churchill, 1999). By insuring households against future welfare losses, microinsurance helps in the reduction of vulnerability and poverty. A poverty reduction strategy needs to address not only those currently experiencing poverty, but those who may also be vulnerable to it over the longer term. Thus, the use of microinsurance in addressing poverty becomes very important. Vulnerability and poverty go hand in hand, but microinsurance can break a part of the cycle that ties them together. According to Dercon (2003), insurance removes the risk of worsening poverty or poverty traps.

Microinsurance also serves as an effective tool for the separation of fluctuations in consumption from fluctuations in earnings and wealth (consumption smoothing) (Arun & Steiner, 2008). The presence of uninsured risk results in welfare losses. This may lead to substantial hardships for the low-income earners (Dercon, 2003). Microinsurance prevents welfare losses as low-income

[1] Low-income households, the poor and informal sectors workers are used interchangeable throughout this study.

households are indemnified by insurers against events that may force them to sink below the poverty line.

Microinsurance as a social protection tool can also reduce the incidence of child labour by eliminating economic vulnerability of households, enabling children to access education (Chakrabarty, 2012; ILO, 2014). Many social protection stakeholders such as the ILO regard microinsurance as a priceless tool for the improvement in the welfare of millions of people in the informal economy worldwide.

Despite the strong theoretical foundation, the empirical literature is limited in depth and inconclusive in evidence. Whereas some studies discovered that microinsurance leads to counterintuitive tendencies such as moral hazard, adverse selection and inertia in investment among households and microenterprises (Gine & Yang, 2009; Giesbert *et al.,* 2011), others such as Guha-Khasnobis and Ahuja (2004) and Nicola (2011) argued that microinsurance facilitates households' and microenterprises' investments into high yielding projects which improve their productivity and welfare. A third group of authors (Gumber, 2001; Smith & Sulzbach, 2008; Wagstaff *et al.,* 2009; Lei & Lin, 2009; Dercon *et al.,* 2012) report of either mixed results or no effect at all.

Also the experience of Europe and America shows a positive relationship between insurance, savings levels and economic well-being (Starr-McCluer, 1996; Guariglia & Rossi, 2004), but that of some Asian countries is said to be negative (Cheung & Padieu, 2011; Hsu *et al.,* 2011). The inconclusive empirical evidence from the various regions of the world and the many gaps in the existing literature calls for a very rigorous country-specific study that will test the real impacts of microinsurance on households' welfare.

### 1.2. THE MOTIVATION

The global microinsurance industry has since 2000 recorded increasing market activity with rapid growth observed in almost all regional markets (Swiss Re, 2010). The potential global coverage of the market is estimated at 4 billion low-income persons with the likelihood of generating US$40 billion (Swiss Re, 2010). Out of the estimated market of 4 billion people only 78 million were covered in 2007 (Roth *et al.,* 2007). This has however grown quite remarkable to 174 million lives in India, 44.4 million in Africa and 45 million in Latin America (McCord *et al.*, 2012; ILO, 2013). The African market in particular has experienced fast growth in covered lives and value of premiums. It insured 14.7 million lives and collected US$257 million as premium income in 2010 (Matul *et al.,* 2010). This coverage has grown tremendously from 0.3 percent of Africa's population in 2007 to 4.4 percent in 2012 translating into 44.4 million policyholders (Roth *et al.,* 2007; McCord *et al.,* 2012). In Ghana the private microinsurance market covers about 1.26 million policyholders and

generates premium income of about GHS11.70 million (US$6.09 million) (Buabeng & Gruijters, 2012). The government health insurance scheme also covers about 4.5 million low-income households living and working in the informal sector (NHIS, 2010).

In spite of the impressive growth in the market size, empirical research into the African experience has been limited. The case of Ghana has seen some studies mostly in the area of access to microinsurance. For instances, in assessing low-income earners access to microinsurance Giesbert (2008) delved into the demand for microinsurance by Ghana's rural folks. Similarly Arun and Steiner (2008), Bendig *et al* (2009) and Giesbert and Steiner (2011) have all researched into how access to microinsurance services by low-income earners can be made flexible and affordable. The focus of these researchers and the attention of practitioners as well as regulators have tended to be on how access to microinsurance can be increased. However no impact study exists on the link between microinsurance and welfare in Ghana. More importantly when juxtaposed with the poverty situation in Ghana, it is imperative to ascertain whether the intervention of microinsurance schemes have improved on household welfare through proper consumption smoothing and asset retention.

Practically, microinsurance could lead to different outcomes. It could have counterintuitive effects due to adverse selection and moral hazards. Adverse selection describes a state of affairs where those who have a high probability of being negatively affected by a risky event are the ones who purchase insurance (Brown & Churchill, 1999; McConnell & Brue, 2008; Roth & McCord, 2008). Adverse selection can have a destabilizing effect on an insurance system, because the mechanism of risk-pooling will not function effectively if only those adversely affected by a risky event buy the insurance product.

Moral hazard is the situation where the indemnity enjoyed under insurance creates an incentive for a policyholder to act in an irresponsible manner. That is, due to their protection under the insurance contract, they behave carelessly and this generates greater likelihood of the insured event occurring. For instance, households' savings behaviour might change for the worse due to the uptake of microinsurance products such as life and disability products. Microenterprises may be less aggressive in undertaking new investments with the uptake of microinsurance. For example, agro-based microenterprises that have taken animal insurance policies might be less proactive in undertaking new investments such as the immunization of their animals.

Another counterintuitive debate about microinsurance is its possible crowding-out effect of existing informal social protection mechanisms such as the extended family support and mutual funeral contributions (Dercon *et al.,* 2008). These are counterintuitive arguments which may or may not make microinsurance have a positive impact on households' welfare. There is therefore a need to investigate the real benefits or otherwise of microinsurance schemes.

This study provides new evidence by examining the impact of microinsurance on the welfare of low-income households in Ghana. Indeed the effect of microinsurance on consumption smoothing, asset accumulation and asset inequality are important for the design of microinsurance and welfare schemes. This study therefore fills the apparent empirical gap by assessing the impact of microinsurance schemes in Ghana on the welfare of poor households. The study is organized around four stand-alone essays each of which unwinds a particular empirical labyrinth.

## 1.3. OBJECTIVES OF THE STUDY

The primary objective of the study is to analyse the effect of microinsurance on household welfare. This objective is specified under the following areas:

1. Determine the impact of microinsurance on households' asset accumulation.
2. Evaluate the impact of microinsurance on households' consumption smoothing.
3. Explore the effect of microinsurance on asset inequality among low-income households.
4. Determine whether there is a positive synergy between microinsurance and microcredit in enhancing households' welfare.

## 1.4. RESEARCH QUESTIONS

1. What is the impact of microinsurance on households' assets accumulation?
2. How does microinsurance impact on households' consumption smoothing?
3. What is the impact of microinsurance on asset inequality?
4. How does the synergy between microinsurance and microcredit improve on households' welfare?

## 1.5. RATIONAL FOR EACH ESSAY

As noted earlier four stand-alone essays have been put together to answer the research questions. First, it is expected that microinsurance will indemnify households against risks such as fire, crop failure, flood, illness and theft. This indemnity cover is expected to influence the *ex-ante* investment outlook of households by giving them "a peace of mind" and encouragement to engage in productive activities that can increase asset accumulation. Similarly the pay-out that households receive if an insurable loss occurs has the potential to reduce the use of costly coping strategies such as the disposal of productive assets. This dual role of microinsurance is expected to equip households to accumulate essential assets necessary for welfare improvements. Thus the first essay examines whether the uptake of microinsurance has been beneficial to households in terms of asset accumulation.

Low-income households have diverse strategies for coping with risks. Among such mechanisms for coping with income shocks is the reduction in daily food intake. However reduction in daily

meals can lead to malnourishment with pernicious health conditions. Children are particularly very vulnerable since reduced nutrition can lead to irreversible impairment in health such as stunted growth, slower cognitive and motor development and high morbidity rates (Ray, 1998; Martorell, 1999). As a risk management tool, microinsurance is expected to facilitate proper consumption smoothing by separating shocks in current earnings from current consumption. Therefore the second essay examines the strength of microinsurance as a viable alternative for smoothing consumption among low-income households.

It is also argued that the level of asset inequality between the poor and the non-poor keeps on widening partly due to insufficient economic opportunities for the poor and their inability to deal with risks associated with household and or productive assets. All other things being equal, uninsured risks can increase the level of asset inequality among groups of people. This is more so since assets may have to be sold off to raise money to address emergency shocks. Hence, asset pawning, asset poverty and asset inequality move in tandem, but microinsurance can break a part of the cycle that ties them together. By insuring households against asset loss, microinsurance is expected to close the asset gap between the poor and the non-poor. Hence the third essay explores the asset inequality levels within and between insured and uninsured households as separate cohorts.

Another important factor that can improve upon the welfare of low-income households and microenterprises is access to affordable credit. However, most low-income households have limited access to bank credit due to their perceived high levels of default risks. Some of these risks can be eliminated through microinsurance products. Through microinsurance products such as credit life the rate of default among low-income households and microenterprises can be minimized and this will facilitates the release of more credits to low-income households. It is also argued that the trap of poverty is not only the lack of credit, but also life-cycle and economic risks that threaten the very survival of the poor. Therefore combining microcredit with microinsurance as a financing package will empower them to make sustainable exit from chronic poverty. The fourth essay thus simulates a discussion into how the synergy between microinsurance and microcredit can be explored to improve upon the welfare of low-income households.

## 1.6. AN OVERVIEW OF WELFARE IN GHANA

The last three decades has seen increasing economic growth in Ghana. Her gross domestic product (GDP) for a period of 15 years grew by 4.65 percent between 1991 and 1999, and by 4.98 during the 1999-2006 periods (GSS, 2007). Her average annual GDP growth rate for the period 2005 to 2013 was 7.8 percent (GSS, 2014). This is 68 percent greater than the average for the 1991-1999 periods. The Africa Development Bank (2012) has also reported that since 2003 the economy of Ghana has been growing faster than the growth rate of the entire African continent.

This remarkable growth has translated into drastic reduction of both extreme poverty[2] and moderate poverty by more than 50 percent each over the last two decades. For instance the incidence of extreme poverty has declined from 36.5 percent in 1991/92 to 18.2 percent in 2005/06 and further down to 8.4 percent in 2012/13 (GSS, 2007, 2008 & 2014). The level of moderate poverty has also reduced from a staggering rate of 51.7 percent in 1991/92 to 28.5 in 2005/06 and to 24.2 in 2012/13 (GSS, 2007, 2008 & 2014). Despite this progress, poverty is still widespread in Ghana and is a predominately a rural phenomenon.

The welfare situation incorporates income levels, health, education and access to basic social amenities. These dimensions of poverty interact to consign households to lower welfare levels or standards of living (GSS, 2007). In this regard we examine the trend in these key indicators in Ghana. The geographical dimension of poverty shows a persistent of extreme poverty in the rural areas. As at 2006, as high as 86 percent of the population considered poor were residing in rural communities (GSS, 2007). This has however declined by 8 percentage points in 2012/13 to 78 percent.

The distribution of poverty incidence by main economic activity also indicates that farmers, private informal sector wage employees and the non-farm self-employed are the poorest segments of the population (GSS, 2007 & 2014). The latest nation-wide living standards survey, GLSS VI, reports that “household heads who are farmers are not just the poorest in Ghana, but they contribute the most to Ghana’s poverty” (GSS, 2014:25). A major reason underlying the poverty situation of this population segment is their investment in low risk production at the expense of higher returns. The concept of microinsurance can be used as a catalyst to empower these economically active, but poor people to make a sustainable exit from poverty. The indemnity cover under microinsurance can be used to encourage these people to invest in high risk high yielding economic activities. That is the indemnity provision which serves as a guaranteed safety net and thus eliminates the anxiety about future economic shocks, can empower this segment to engage in high yielding productions. For example, smallholder farmers are likely to increase their scale of production if they are covered under an agricultural microinsurance against crop failure. In addition to microinsurance, government programs that address the challenges of post-harvest losses along the agricultural value chain can equip farmers to overcome poverty. It is also argued that providing a guarantee market for the goods of smallholder farmers at competitive prices can lifts them up from poverty.

[2] According to the Ghana Statistical Service (2014:12), extreme poverty refers to “those whose standard of living is insufficient to meet their basic nutritional requirements even if they devoted their entire consumption budget to food”. The extreme poverty line is living on GHS792.05 per year (approximately US$1.10 a day). The moderate poverty refers to individuals who are “able to purchase enough food to meet their nutritional requirements and their basic non-food needs” (GSS, 2014:7). The moderate poverty line is at GHS1 314.00 per year (US$1.83 a day).

In terms of the degree of access to essential services such as electricity, potable water and hygienic toilet facilities, access of rural households to potable water has increased substantially with about three-quarters having access to good drinking water in 2005/06 (GSS, 2007). The last two decades has recorded increasing investment in the water sub-sector resulting in 122 percentage improvement in the rural areas (World Bank, 2011). This has reduced the rural-urban disparity in access to safe water very significantly (GSS, 2007). However development in sanitation facilities has been minimal. Households in the urban areas, on the other hand, witnessed sharp increases in improved toilet facilities from 1991 to 2006 (GSS, 2007). Indeed, since 1990 the average sanitation facilities in the urban dwellings have consistently been two and three times more than the national and rural average respectively (World Bank, 2011). Similarly access to electricity in the urban centres is about three times that of rural dwellers. Despite the gap, efforts by the central government through the rural electrification program are expected to improve access to electricity in the rural areas.

With regard to health issues the trend of key health indicators points to marked improvement in general health outcomes, however some issues relating to children and women health care are still undesirable. Between 2003 and 2008, 57 percent of births took place in recognized health facilities (GSS *et al.,* 2009). Professionally assisted delivery has also increased from 47 percent in 2003 to 59 percent in 2008 (GSS *et al.,* 2009). Although this performance is good, it is quite lower than the global average of 56 percent in 1990 to 68 percent in 2012 (UN, 2014). Quite disturbingly 41 percent deliveries occurred without a professional medical assistance and a sizable minority of 11 percent used relatives or no assistance at all during delivery (GSS *et al.,* 2009). Deliveries without professional medical assistance can increase the rate of child and maternal mortality. To this extent expansion of professional health facilities especially into rural areas will be very critical for the reduction of maternal mortality by three quarters as specified in the MDGs. Although the government offers free health insurance to pregnant women, access to this facility is very limited in the rural areas.

Globally child mortality has reduced by 48 percent from 12.6 million in 1990 to 6.6 million in 2012 (UN, 2014). Notwithstanding this global progress, sub-Saharan Africa and Southern Asia have high levels of child mortality. These two regions account for four out of every five child deaths worldwide (UN, 2014). The case of Ghana is relatively better than both the sub-Saharan Africa and the global performance. For example, childhood mortality has decreased quite substantially from 111 per 1 000 live births in 2003 to 80 per 1 000 live births in 2008. This means “one in every thirteen children dies before reaching the age of five. Over two-thirds of these deaths occur in the first year of life” (GSS *et al.,* 2009:24). Though this is lower than the average of sub-Saharan African, improved access to reproductive health care such as early visits to clinics for antenatal and postnatal care as well as maternal education can eliminate child mortality.

The well-being of households can also be gauged from the consumption of food containing the required amount of nutrients. Nutrient deficiency especially iron deficiency poses significant threat to the health of children and nursing mothers. The Ghana Demographic and Health Survey (GDHS) report an increase in the rate of anaemia in children from 76 percent in 2003 to 78 percent in 2008. It further indicates that 23 percent, 48 percent and 7 percent are mildly, moderately and severely anaemic respectively. The level of iron deficiency among women also increased sharply from 45 percent in 2003 to 59 percent in 2008. The Upper East region has the lowest percentage of anaemic women (48 percent) while the Western region has the highest level of 71 percent (GSS *et al.,* 2009).

Such levels of nutrient deficiency can lead to weakness in bodily growth and development especially in children. For example, 28 percent of children below the age of five are stunted and 10 percent are severely stunted. A further 9 percent and 14 percent are wasted and underweight respectively (GSS *et al.*, 2009). This situation can disrupt not only the bodily growth of children, but more importantly their emotional and cognitive faculties. Microinsurance can be used as part of policy interventions to address the nutrient deficiencies through proper consumption smoothing. This will ensures that even during periods of income shocks, households' food consumption at required calories is not compromised by lack of sufficient funds.

## 1.7. CHAPTER ORGANIZATIONS

The thesis is organized around four main themes under household welfare: asset accumulation, consumption smoothing, asset inequality and welfare synergy between microinsurance and microcredit. Each theme has been developed into a stand-alone essay. The first chapter introduces the research and highlights some of the debates surrounding the impact of microinsurance on welfare.

The second chapter reviews past and current issues in the Ghanaian microinsurance sector and discusses the major market trends and patterns of the formal insurance markets. The third chapter begins the empirical investigation by evaluating the impact of microinsurance on household asset accumulation. The fourth chapter assesses the impact of microinsurance on consumption smoothing among low-income households.

The fifth chapter explores the effect of microinsurance on asset inequality among low-income households. Chapter 6 investigates the synergy between microinsurance and microcredit in the improvement of households' welfare. The thesis ends with chapter seven which summarises the conclusions and policy recommendations.

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# CHAPTER 2
# OVERVIEW OF THE MICROINSURANCE SECTOR IN GHANA

## 2.1. INTRODUCTION

This chapter reviews the market patterns and trends of the microinsurance sector in Ghana. Since the microinsurance sector is embedded in the mainstream insurance industry, a general overview of the insurance market is provided so as to situate the institutional arrangements in which microinsurance companies operate.

## 2.2. DEVELOPMENTS IN THE FORMAL INSURANCE SECTOR

Formal insurance market operations started in Ghana in the 1920s with a foreign-owned insurance company, Guardian Royal Exchange Assurance (Gh) Limited now known as Enterprise Insurance Company, as the first insurance firm to be established in 1924. In 1955 the first local insurance firm, the Gold Coast Insurance Company, was also started to insure life business (Ansah-Adu *et al*., 2012). The State Insurance Corporation (SIC) was also established by the government of Ghana in 1962. It was granted statutory monopoly over the underwriting of all government businesses. In 1972 Ghana Reinsurance Organization (Ghana Re) was set up as a subsidiary of SIC to provide reinsurance services to all insurers operating in the country. All insurers were required by law to cede not less than 20 percent of all general businesses written locally and 5 percent of international non-life policies to Ghana Re (Ansah-Adu *et al.,* 2012).

During the last two decades regulatory reforms have been initiated which have transformed the industry from a state-led monopoly to a market-driven industry. Now the industry operates under a new law, Insurance Acts 724 (2006), which has aligned the sector's operations to the core principles of the International Association of Insurance Supervisors. In order to promote sound risk management and actuarial practices, accountability and effective corporate governance, the new insurance law prohibits composite insurance businesses. Thus all insurance companies have been separated into life and non-life businesses. The law has not only empowered the National Insurance Commission (NIC) to provide effective regulatory supervision of the industry, but it has also enhanced the entry of many foreign-owned insurers unto the market.

The regulatory and institutional reforms have increased market activity which has resulted in the increase of licensed insurance entities[3] (see Table 2.1) by 31 percent from 74 in 2007 to 97 in 2011 (NIC, 2007 and 2011). This has engendered keen competition among the various insurers in both the life and non-life businesses. Although SIC is the dominant insurer in both subsectors, its performance has been declining while Enterprise Insurance Ltd has seen continuous growth at an

[3] This is excluding agents

average of 2 percent since 2003. The market shares measured by premiums underwritten by the industry leaders in both the life and non-life subsectors are presented in Tables 2.2 and 2.3.

**Table 2.1: Licensed insurance entities as at December, 2011**

| Insurance Entity | Number Licensed |
|---|---|
| Non-Life companies | 24 |
| Life companies | 18 |
| Reinsurance companies | 2 |
| Insurance brokers | 51 |
| Reinsurance brokers | 1 |
| Loss adjusters | 1 |
| Agents | 1 200 |

Source: NIC, 2009, 2010, 2011.

**Table 2.2: Market Shares of Life Companies**

| Company | Percentage of market share (%) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
| State Insurance Company Ltd | 22 | 24 | 26 | 29 | 32 | 30 | 28 | 26 |
| Gemini Life Insurance Company Ltd | 18 | 16 | 15 | 14 | 16 | 13 | 14 | 11 |
| Enterprise Life Assurance Ltd | 8 | 10 | 12 | 13 | 15 | 17 | 19 | 21 |
| Star Life Company | 13 | 10 | 10 | 7 | 8 | 9 | 10 | 10 |
| Metropolitan Life Insurance Ltd | 14 | 10 | 9 | 7 | 7 | 7 | 6 | 6 |
| Vanguard Life Insurance Ltd | 6 | 8 | 4 | 9 | 6 | 6 | 7 | 9 |
| Others | 19 | 22 | 24 | 21 | 16 | 18 | 16 | 17 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Source*:* NIC, 2007, 2010.

**Table 2.3: Market Shares of Non-life Companies**

| Company | Percentage of market share (%) | | | | |
|---|---|---|---|---|---|
| | 2003 | 2004 | 2005 | 2006 | 2007 |
| State Insurance Company Ltd | 38 | 37 | 40 | 39 | 37 |
| Enterprise Insurance Company Ltd | 16 | 14 | 15 | 12 | 12 |
| Metropolitan Insurance Company Ltd | 12 | 10 | 10 | 10 | 9 |
| Vanguard Insurance Company Ltd | 8 | 9 | 8 | 9 | 8 |
| Star Insurance Company Ltd | 5 | 7 | 7 | 7 | 7 |
| Ghana Union Insurance Company Ltd | 5 | 5 | 5 | 4 | 4 |
| Others | 16 | 18 | 15 | 19 | 23 |
| Total | 100 | 100 | 100 | 100 | 100 |

Source: NIC, 2007, 2010.

In 2001 the industry recorded an annual gross premium income of GHS32.25[4] million, accounting for 0.85 percent of Ghana's gross domestic product. This was quite low compared with 17.34 percent for South Africa. However, since 2001 the sector has recorded an increase of about 20 times in gross premiums, reaching GHS628.53 million in 2011. The non-life subsector, which generates much of the total industry premiums, has total assets of GHS651 million while the life sector has GHS492 million (NIC, 2011). The key indicators of both the life and non-life subsectors are illustrated in Table 2.4. The growth in the industry and the premiums mobilized by both sectors of the industry has long-term positive effects on the economic growth of Ghana (Alhassan & Fiador, 2014).

**Table 2.4: Key Indicators of the Life and Non-life Sectors, 2011**

| Indicators | 2011 (GHS million) | 2010 (GHS million) | Growth (%) |
|---|---|---|---|
| ***Life Companies*** | | | |
| Total Assets | 492 | 367 | 34 |
| Total Investments | 371 | 273 | 36 |
| Actuarial Liabilities | 346 | 243 | 42 |
| Total Capitalization | 104 | 90 | 17 |
| | | | |
| ***Non-life Companies*** | | | |
| Total Assets | 651 | 582 | 12 |
| Total Investments | 309 | 301 | 3 |
| Actuarial Liabilities | 184 | 140 | 31 |
| Total Capitalization | 324 | 313 | 4 |

Source: NIC, 2011.

The increased market activity and the growing competition have exposed the industry to operational abuses such as price undercutting, unethical underwriting and marketing practices and over-reliance on credit (NIC, 2010). The industry is also plagued with a growing number of complaints by policyholders against almost every insurer. Since 2005 the Complaints and Settlements Bureau (CSB)[5] has received a staggering total of 1 981 complaints from policyholders against various insurance companies for reasons such as:

1. Disparity between benefits promised by insurers verbally from stated benefits in policy documents;
2. Unauthorised deductions of premiums from a policyholder's bank account even after policy has been surrendered;

[4] This amounts to US$32.25 million in 2006, using the then exchange rate between the GHS and the US$
[5] The CSB is the arbitration arm of the NIC.

3. Disagreements regarding claims settlement, quantum of claims and payments (NIC, 2010 & 2008).

The many complaints and the reasons underlying them have adverse effects on the confidence of the public about the trustworthiness of insurance firms, and this can reduce the already low levels of insurance penetration in the country. It is therefore not surprising that the level of insurance penetration has reduced from 1.89 percent in 2010 to 1.06 percent in 2011 as against 14.8 percent in South Africa, 7.3 percent in Namibia, 2.8 percent in Kenya and 4.8 percent in Malaysia (Swiss Re, 2010a). The level of insurance penetration for the past ten years is presented in Table 2.5.

In terms of risk management and cost efficiency, Ansah-Adu *et al.* (2012) indicated that out of 30 insurers 25 have inconsistent efficiency scores and 2 have retrogressive efficiency scores. Their findings suggest that non-life firms are less efficient in the management of their cost structures. The presence of cost inefficiencies in risk management may impede effective underwriting regarding what risk to absorb, what to avoid and what to transfer to a reinsurer.

**Table 2.5: Premium Growth and Insurance Penetration**

| Year | Premiums (GHS) | Growth (%) | Penetration (%GDP) |
|---|---|---|---|
| 2001 | 32 251 600 | 26.0 | 0.85 |
| 2002 | 47 205 989 | 46.3 | 0.95 |
| 2003 | 71 283 978 | 51.0 | 1.08 |
| 2004 | 92 583 146 | 29.8 | 1.16 |
| 2005 | 122 925 795 | 24.7 | 1.26 |
| 2006 | 164 207 266 | 33.5 | 1.40 |
| 2007 | 209 457 409 | 27.5 | 1.49 |
| 2008 | 276 494 733 | 32.0 | 1.58 |
| 2009 | 343 072 874 | 23.2 | 1.58 |
| 2010 | 458 694 769 | 33.0 | 1.89 |
| 2011 | 628 528 775 | 37.2 | 1.06 |

Source: NIC, 2005, 2007, 2011.

## 2.3. THE MICROINSURANCE SECTOR

### 2.3.1. Clients' Characteristics

The clients of microinsurance scheme are mostly households living and working in the informal sector. The economically active ones are smallholder farmers, fruits and vegetables sellers, fishmongers, dressmakers and tailors, carpenters, truck pushers, "head-porters", chop-bar[6]

[6] Local restaurant

operators and provisions[7] sellers. The income flow of these workers is mostly seasonal in timing and uneven in amount. For instance farmers may record significant increase in income during the harvesting period, but can face drastic decline in income during the planting season. This is why most successful microinsurance schemes structure the insurance premium payments according to the cash flow of the clients.

With regard to the level of income, microinsurance clients have been classified into two levels by Swiss Re (2010b). These are: (1) persons living above US$1.25[8] per day up to US$4 per day, and (2) those whose daily consumption is below US$1.25. Those in the first category are the economically active persons and represent the target market for commercial viable microinsurance (Swiss Re, 2010b). Almost all the microinsurance products on the Ghanaian market fall within this category. Examples of such products are: Anidaso, Edwadifu ahobanbo, Sika plan, Abusua nkyemfa, and Tigo family care. Table 2.7 provides more examples and details of these products.

The second category however consists of the extremely poor with little or no earnings to meet the basic necessities of life. Providing market-based microinsurance to this category may not be viable and sustainable (Swiss Re, 2010b). Nevertheless, the extremely poor can be insured through government sponsored schemes such as providing country-wide social protection policy such as health insurance and unemployment insurance (Swiss Re, 2010b). An example of such a policy is the National Health Insurance Scheme (NHIS) of Ghana which has relieved the poor of out-of-pocket health care costs. Governments can also enter into a public private partnership (PPP) agreement for the provision of microinsurance to the extremely poor at subsidised premiums by government (Swiss Re, 2010b). An example of microinsurance PPP agreement is the current partnership between the government and the Ghana Insurers Association (GIA) under the Ghana Agricultural Insurance Programme (GAIP) for the provision of microinsurance services to farmers at subsidised premiums.

The global market size of microinsurance for the economically active clients (US$2 to US$4 per day) is estimated to be 2.6 billion people with the capacity to generate premium income of US$33 billion while that of the extremely poor is 1.4 billion people, generating premium income of US$7 billion (Swiss Re, 2010b). Figure 2.1 illustrates the market potential of the global microinsurance market.

[7] Sellers of household consumables, textile etc
[8] This is based on 2005 international purchasing power parity

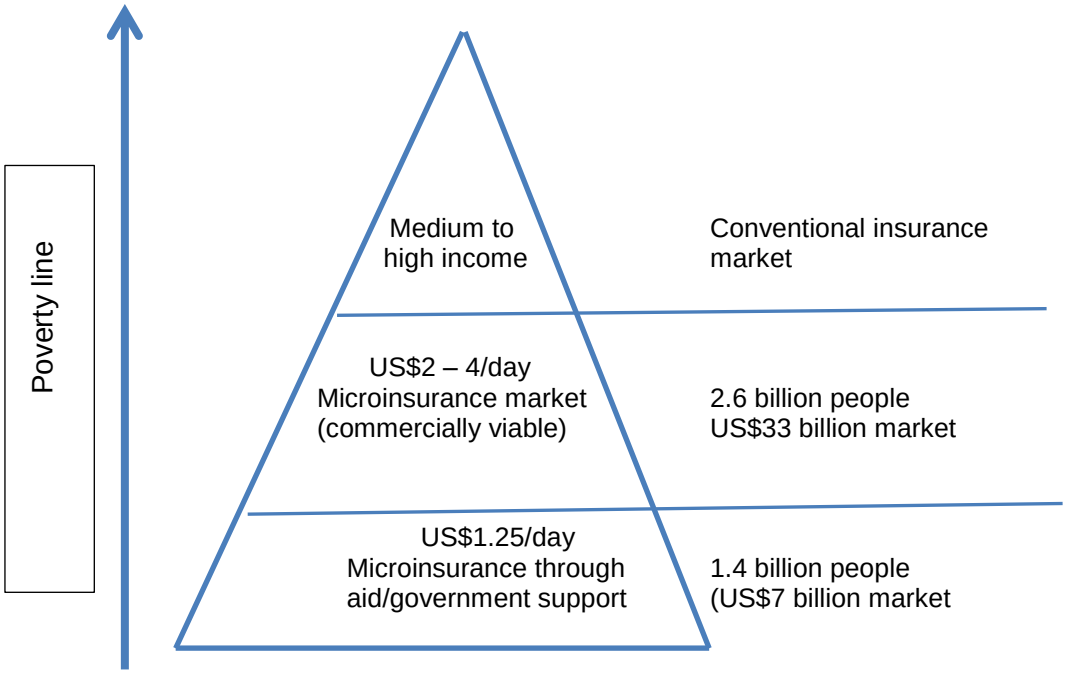


**Figure 2.1: Poverty Line and Size of the Microinsurance Market**

Source: Swiss Re (2010b); Chen and Ravallion (2010); http://iresearch.worldbank.org/PovcalNet.

The market in Ghana though in a nascent stage has witnessed impressive growth in the number of firms, policyholders and underwriting activities. The National Insurance Commission uses the concept of down-scaling to promote the extension of insurance services to the lower end of the market. Its policy document on microinsurance states that "insurers cannot designate a product as microinsurance unless it considers that the product satisfied the following criteria: (1) target at low-income households; (2) affordable for low-income households and (3) accessible to low-income households" (NIC, 2011:3). It also requires insurers to make microinsurance contract very simple to understand with less legalese and no or few exceptions. It further requires claims to be dealt with expeditiously within 7 to 10 days (NIC, 2011). The operational definition of microinsurance in this study takes from both Churchill (2007) and NIC (2011).

From the early 2000s, the NIC begun to address the institutional and market barriers relating to the demand for and supply of microinsurance. The demand barriers have been identified as negative perception about insurers, lack of knowledge about how insurance works and affordability (Bendig *et al.,* 2009; Steiner & Giesbert, 2010; Finmark Trust, 2010; Owusu *et al.,* 2012; Ackah & Owusu, 2012). The NIC together with other stakeholders has instituted a national insurance literacy campaign to resolve some of these barriers to the uptake of microinsurance services.

On the supply side, the Commission has reviewed its microinsurance policy by removing certain restrictions in order to incentivize formal insurance companies to enter the microinsurance market. For instance, formal insurance firms do not need approval before rolling out a microinsurance

product, but the product needs to be filed with the Commission (NIC, 2011). This is intended to reduce the time and cost that formal insurers incur in getting product approval. It is also intended to encourage insurers to direct attention to the lower end of the market. In addition the NIC, with technical support from the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), has trained insurers on the benefits of the microinsurance market and how to adopt cost effective ways to enter and stay profitable in the microinsurance market.

Through such policy facilitations many commercial insurers have shown increased interest in getting further involved in microinsurance provision (Buabeng & Gruijters, 2012). As at July 2012 11 insurers comprising 8 life and 3 non-life insurance companies have rolled out 16 microinsurance schemes across the rural and urban areas of the country (NIC & GIZ, 2012; Buabeng & Gruijters, 2012). These schemes covered a total of 66 241 policyholders in 2010 and 1 259 055 in 2011, indicating a whopping percentage growth of more than 1 800 percent (Buabeng & Gruijters, 2012). The product portfolio of the market is dominated by health, savings-linked and funeral/term life policies. Other policies are drought index, credit-linked and property policies. Term life, also called a funeral policy, is the most patronized product with a total of 319 244 policies covering more than half a million policyholders. Credit-linked products, which indemnify a borrower against an outstanding loan amount, are the second most patronized schemes, with coverage of more than 400 000 policyholders. Though the country is predominantly agrarian, the agricultural schemes have the lowest number of policies covering a little more than 3 000 farmers.

In 2011, the microinsurance sector's annual premium stood at GHS11 703 488. The savings-linked or endowment products have about 80 percent share of the premiums paid, making it the largest scheme in terms of financial value. This may be explained by the scheme's features which allow the insurable loss to be covered and also provide a savings component for the insured. More than GHS4 million valid claims were paid to various policyholders most of whom were traders whose goods were destroyed by fire in some market centres in the country. Table 2.6 presents the types of microinsurance products on the market, the number of policies, number of insured persons, premiums and claims paid.

**Table 2.6: Market Indicators of the Microinsurance Sector, 2011**

| Product | No. of Products | No. of Policies | No. of Policyholders | Premiums (GHS) | Claims (GHS) |
|---|---|---|---|---|---|
| Funeral/Term Life | 4 | 319 244 | 626 582 | 903 169 | 269 121 |
| Savings-linked/endow | 7 | 106 461 | 130 346 | 9 255 396 | 3 935 629 |
| Credit-linked | 3 | 257 507 | 497 197 | 1 206 135 | 158 341 |
| Agricultural | 1 | 10 | 3 073 | 36 209 | 0 |
| Property | 1 | 1 857 | 1 857 | 302 579 | 58 403 |
| Total | 16 | 685 078 | 1 259 055 | 11 703 488 | 4 421 494 |

Source: Buabeng and Gruijters, 2012; NIC and GIZ, 2012.

### 2.3.2. Examples of Microinsurance Providers

This section provides a review of the major providers of microinsurance services and their products. Examples of the major providers are: Gemini Life Insurance Company (GLICO), MicroEnsure, SIC Life, Star Life, Ghana Agricultural Insurance Program (GAIP) (see Table 2.7).

*GLICO's Anidaso*[9] *Policy*[10]

The Anidaso insurance policy was developed by Gemini Life Insurance Company (GLICO) with technical assistance from CARE International in 2003 to meet the insurance needs of low-income earners. The policy is a term insurance plan and it is offered as a joint product with the Edwa Nkosuo[11] product. The Anidaso policy and the Edwa Nkosuo product together provide a savings avenue and insurance protection for low-income households and SMEs at very affordable premiums.

**Table 2.7: Microinsurance Products**

| Insurer | Microinsurance Product | Class of Policy |
|---|---|---|
| GLICO | Anidaso | Life, Family Life, Endowment, Hospital Cash, Children's Education |
| Donewell Insurance | Edwadifu Ahobanbo | Life, Savings-linked |
| SIC Life | Sika Plan | Life, Savings-linked, Funeral |
| Star Life Assurance | Various | Life, Health, Funeral, Property |
| Vanguard Insurance | Shop Owner's Policy | Property, Goods in Transit |
| Ghana Agricultural Insurance Pool | Drought-Index | Crop insurance, Food Chain Policy |
| Credit Unions | Life Savings | Life |

Source: Adapted from Wiedmaier-Pfister and McCord, 2009.

The Anidaso Policy can be taken out as a stand-alone policy or together with the savings benefit. It covers the life of the policyholder and his/her immediate dependents such as a spouse. Other benefits of the policy include hospitalization income, accident and disability benefit. The product is sold by GLICO in partnership with 26 rural and community banks (RCBs) and a number of microfinance firms in five administrative regions of Ghana. The distribution partnership with RCBs and MFIs has helped the company to increase the number of its policyholders by 471 percent, from 14 000 in 2005 to 80 000 in 2009.

[9] Anidaso means hope.
[10] http://www.glicolife.com
[11] Edwa Nkosuo means successful market.

*MicroEnsure Products*[12]

MicroEnsure is a USA based microinsurance intermediary which has partnered certain local insurers to provide affordable insurance services to SMEs and low-income households. Established in 2005, it is now operating in Ghana, Kenya and Tanzania. Among others it offers the Obra Pa, Tigo Family Care, savings-linked and Package policies. The Obra Pa policy covers credit life, fire, flood and property loss. The Tigo Family Care policy extends free life cover to subscribers of Tigo[13] depending on the amount of airtime used within a month.

In addition to the airtime usage, policyholders desiring to enjoy extra benefits under the life cover are required to pay GHS1 per month as insurance premiums. The savings-linked policy provides free life cover to a depositor who saves a minimum of US$25 per month in designated banks or microfinance firms. The life cover benefit increases with the level of savings made over a specified period. The Package policy combines a number of products to meet a specific need. It covers all the benefits under the Obra Pa policy in addition to funeral, health and disability into a single 'care' policy. This reduces clients' subscription cost and facilitates easier administration.

*The Star Microinsurance Products*

Star Life Assurance has established a subsidiary called Star Microinsurance Services Limited which is dedicated to the provision of only microinsurance services to the informal sector and low-income households. It offers investment and funeral policy, micro-health plan, childcare plan, *abusua nkyemfa*[14], banc assurance, uni-mobile, savings-linked and credit protection plan. The uni-mobile is a life policy sold in partnership with a commercial bank (Unibank Limited) and a mobile phone company (Airtel Limited). It is an innovative product that allows clients to use mobile phones to pay insurance premiums, make bank deposits, transfer money and top-up mobile phone credit[15]. Star Microinsurance Services Limited distributes its products in partnership with 25 rural banks, 6 microfinance companies, 35 savings and loans companies, 11 direct market agencies and on the extensive platform of Ghana Post Company. It has also partnered the Ghana Cooperative of Susu Collectors Association (GCSCA) to provide microinsurance products to GCSCA's members[16].

*The Drought Index Product*

This product indemnifies crop farmers and other entities in the crop production chain against crop failure due to drought experienced during a cropping cycle. It is intended to empower smallholder farmers to overcome crop failure and financial consequences of drought and erratic rainfall patterns (Appenteng-Mensah & Gille, 2012). The product was introduced in 2011 by the Ghana Agricultural Insurance Programme (GAIP) for maize farmers in the three northern regions of

[12] http://www.microensure.com
[13] Tigo is a mobile telecommunications provider.
[14] Abusua nkyemfa is a local parlance which translates as contribution for the wellbeing of the family
[15] (www.starmicroinsurance.gh.com)
[16] (www.starmicroinsurance.gh.com)

Ghana. Since drought is a covariant risk, it can destroy several hectares of crops owned by many farmers. This widespread impact of drought makes it financially difficult for a single insurer to insure farmers against drought. In order to overcome this, GAIP put together a pool of 19 non-life insurers to underwrite this product. The underwriters group, known as the Technical Management Unit (TMU), operates under the auspices of the Ghana Insurers Association (GIA) to underwrite the drought index product (NIC, 2011).

As at the end of 2011, over 3 000 farmers with a total crop area of 5 045 acres had been insured under the drought index scheme (Appenteng-Mensah & Gille, 2012). In all a total premium of GHS36 000, translating into a total sum assured of GHS0.58 million, has been paid (Appenteng-Mensah & Gille, 2012). The GAIP has expanded coverage of the product to the farming communities in six regions: Northern, Upper East, Upper West, Brong Ahafo, Ashanti and Eastern.

The drought index product uses the level of rainfall measured at Ghana Meteorological Agency's (GMet) weather stations as the basis to trigger claims pay-outs. As explained by Appenteng-Mensah and Gille (2012) and GlobalAgRisk (2006), claims pay-outs are triggered if during the contract period there is a shortfall of the calibrated rainfall below a pre-determined threshold. For instance, from May to September 2012, the weather stations at Tamale and Pong Tamale recorded rainfalls which were below the contractual pre-defined thresholds (i.e. less than 2.5mm per day). This triggered a pay-out to 136 maize farmers in the Northern, Upper East and Upper West regions of the country (GNA, 2012).

The area yield index insurance (AYII) is another agricultural microinsurance product which the GAIP is currently piloting in three districts in the Upper West region (Stutley, 2012). The AYII uses the average yield of a defined geographical area to indemnify the shortfall in crop yields (Stutley, 2012). Unlike the drought index, the AYII provides extensive coverage of weather-related risks such as drought, excess rainfall or flooding, windstorms, pest and diseases as well as risks that affect crop yield at a district level (Appenteng-Mensah & Gille, 2012).

*The National Health Insurance Scheme*[17]

The National Health Insurance Scheme (NHIS) was started in 2003 by the government of Ghana to provide health insurance to all Ghanaians. It operates through 145 district mutual health insurance schemes. Each district distributes its scheme at designated places in rural and urban areas through registered agents and scheme officers who call at homes and work places to register and collect premiums from policyholders. It has over 5 000 service providers which are drawn from public and private hospitals, clinics and pharmacies. For beneficiaries to access health care they

[17] According to the operational definition of microinsurance by the NIC and as adopted in this study, only the information on the informal sector clients of the NHIS is covered in this study.

are required to follow the “gate-keeper system”, that is, to first report to a primary care facility, and subsequently to the second and third levels of health care by way of referral (NHIA, 2010).

The scheme is funded by a combination of VAT levy and compulsory monthly premiums from the social security contributions of formal sector workers. This entitles formal sector workers access to the scheme upon registration. Informal sector workers are however not bound to join the scheme, but may do so voluntarily after paying the required premiums which range from GHS12 to GHS15 (US$6 to US$7.5) per person yearly (Matul *et al*., 2010). Currently, about 66 percent of the population has signed up for this scheme, of which 29.2 percent (4.5 million) are from the informal sector (NHIS, 2010). Persons below 18 years, the aged (above 70 years), pensioners under the Social Security and National Insurance Trust (SSNIT) and indigents are exempted from paying premiums under the scheme, but they are required to pay a registration fee of GHS5.00 (US$2.00) per annum. Tables 2.8 and 2.9 provide summary statistics of the scheme.

With increasing coverage, health services utilization has also grown, averaging two visits per head per year for insured persons, compared to the national level estimated at 0.5 (Matul *et al.,* 2010). Indeed, by removing the out-of-pocket expenditures on health, the NHIS has improved access to professional health care facilities and skilled birth attendants.

**Table 2.8: Summary Statistics of the NHIS, 2010**

| Members/Items | Numbers |
|---|---|
| Schemes in Operation | 145 |
| Total Registered Members (% of Population) | 66.4% |
| Active Members as % of Total Registered Members | 80.6% |
| Medical Conditions Covered | 95% |
| Number of Service Providers | Over 5 000 |

Source: The Ghana National Health Insurance Authority, 2010.

**Table 2.9: Groups and Percentage of Registered Members, 2010**

| Category | Number Registered | Percentage (%) |
|---|---|---|
| Informal Adult | 4 546 059 | 29.2 |
| Aged (≥70 years) | 1 006 529 | 6.5 |
| Under 18 years | 7 604 324 | 48.9 |
| SSNIT Contributors | 915 924 | 5.9 |
| SSNIT Pensioners | 81 604 | 0.5 |
| Indigents | 350 035 | 2.3 |
| Expectant Mothers | 1 051 41 | 6.7 |

Source: The Ghana National Health Insurance Authority, 2010.

### 2.3.3. Microinsurance Distribution Model

The most significant issue for the achievement of sustainable expansion in microinsurance services is proper distribution which ensures that microinsurance products reach the target market in a cost effective manner (McCord, 2012). Microinsurance distribution is not just sales, but careful management of clients' trust and expectation levels, and delivery of products that meet the specific socio-economic circumstances of the clients. As noted by Helms (2006), the distribution model must address (1) scale – increasing financial access to a greater percentage of the population; (2) depth – reaching both the urban and rural poor in remote locations; (3) cost – lowering transaction costs through technology. In addition, claims must be assessed, approved if valid and paid very timeously (Steinmann, 2012).

Achieving scale, depth and cost effectiveness by selling many "tiny" policies to millions of prospective clients spread across large geographical areas is mostly beyond the existing branch network and cost structures of most traditional insurance firms (Steinmann, 2012). In order to overcome this hurdle most insurers have adopted four main models for the distribution of microinsurance products: partner-agent model, nodal societies, direct sales agents and telecom operators.

Under the partner-agent model, commercial insurers enter into partnerships with rural and community banks as well as microfinance institutions for the delivery of microinsurance products to the target communities (McCord, 2006). The benefits to an insurer under this model include easy access to an existing client base otherwise difficult to reach, easy access to infrastructure such as a client information database, and increased access points and physical footprint (Angove *et al.,* 2012). The delivery partner is usually responsible for the day-to-day business activities such as sales, premium collections, claims processing and settlement and timely communication with policyholders (Steinmann, 2012). The partner-agent model is the most widely used distribution channel in Ghana with more than 300 000 policies currently being managed under it. Some providers who are using this model have increased their market shares and are beginning to reap the benefits of economies of scale.

Under the nodal societies model insurers deliver the microinsurance services through mutual organizations such as churches, market women associations and civil societies such as community-based organizations (CBOs) and NGOs (Guha-Khasnobis & Ahuja (2004). Being member-based, nodal societies exert peer influence and group monitoring which are essential for the reduction of moral hazards, adverse selection and fraud associated with microinsurance demand. Nodal societies also help to reduce transaction costs by making bulk payments of premiums on behalf of members as well as the speedy determination and settlement of valid claims.

The direct sales agents are a specialized staff of insurers who have set up sales points at various destinations, especially in market centres, to market microinsurance products. These micro-agents deal directly with the clients in all stages of the distribution such as product delivery, premium collections and claims settlements. The *susu* concept is the usual mode of collecting the insurance premiums.

Another model in practice and which can be referred to as “mobile microinsurance”, is where mobile telecommunication organisations partner insurance firms to make microinsurance accessible to their subscribers. This relatively new model has revolutionized the distribution of microinsurance by increasing access in a very quick manner, and this has boosted the efforts of stakeholders to increase microinsurance access. The technology allows insurers to sell, collect premiums and effect claims payments. This has reduced the high overhead costs usually associated with the underwriting of several thousands of small policies. For example, Tigo and Airtel mobile telecommunications are in partnership with MicroEnsure and Star Microinsurance respectively to reach low-income households. Figure 2.1 illustrates the conceptual framework of the distribution models in Ghana, and Table 2.10 presents the different distribution channels of microinsurance companies in Ghana and the level of outreach in terms of policies sold.

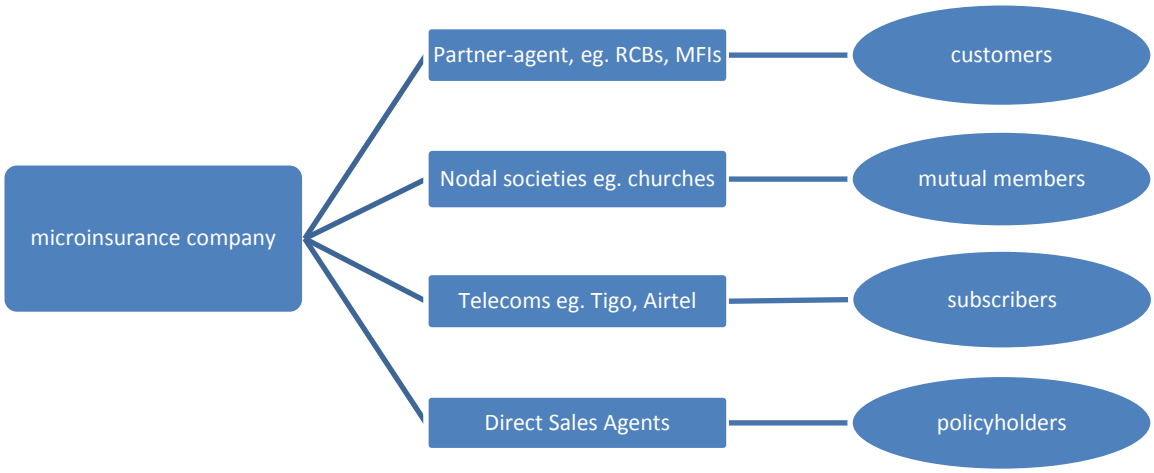


**Figure 2.2: Microinsurance Distribution Models**

Source*:* Author’s Design.

**Table 2.10: Distribution Models and Policies Sold, 2011**

| Distribution Models | Total Policies Distributed |
|---|---|
| Direct Sales (Company Agents) | 24 668 |
| RCBs and MFIs | 343 243 |
| Telecoms Providers | 302 194 |
| Nodal Societies: | |
| Churches | 13 116 |
| Others | 1 857 |

Source: Buabeng and Gruijters, 2012; NIC, 2012.

### 2.3.4. Challenges of the Microinsurance Sector

The NIC's microinsurance strategy being implemented through the down-scaling concept has increased the scale and outreach of microinsurance to more than 1 million lives, nevertheless, the down-scaling concept does not promote policyholders' input into product design nor their involvement in the governance and risk management structures of the schemes. This situation may create mistrust in insurers by prospective policyholders.

Another challenge of the sector is lack of sufficient knowledge about how the risk pooling concept of microinsurance works. Difficulty in understanding this concept and its implications creates the misconception that microinsurance and bank savings are the same. This situation, which can obscure the true value of microinsurance, according to Baidoo and Buss (2012:90) "is further exacerbated by the inability of some agents to explain policy terms and conditions to prospective clients". Indeed the 2010 FINSCOPE Household Survey of Ghana reports the obstacles to the demand for insurance services as lack of knowledge about how insurance works, the perception that risks are by providence and lack of trust in insurers (Finmark Trust, 2010).

Currently the sector is not covered by the Insurance Law, Act 724 (2006). This lack of legislative backing has restricted the entry of more insurers into the microinsurance market. It is however noteworthy that the NIC has prepared a transitional framework and market guidelines to streamline the activities of the sector. It has also incorporated it in the proposed amendments to the insurance law.

The sector is also challenged by certain market abuses such as moral hazards, adverse selection and fraud. These abuses can render an insurer insolvent and destroy the already low confidence that the public has in insurance services. Adverse selection and moral hazards can be controlled through due diligence and screening during the underwriting process, co-payments and deductibles and waiting periods (Roth & McCord, 2008).

## 2.4. CONCLUSION

This review has highlighted some stylized facts and current trends of the Ghanaian insurance industry with particular focus on the microinsurance sector. The review shows that although the microinsurance sector is at the teething stage, it has recorded impressive growth with about one million lives insured under different policies. Recognizing its immense potential to facilitate insurance inclusiveness to the informal economy, the NIC has initiated a policy amendment to provide legislative backing to it.

The major challenges of the microinsurance sector are how to achieve large scale expansion in a cost effective manner, low levels of insurance literacy, the negative perception that risks are by fate, and lack of trust in insurers.

Challenges surrounding the determination and payments of valid claims on time have also undermined the growth of the microinsurance sector. Microinsurance can add more to household welfare if the delicate issues concerning claims determination and payment are handled very timeously as stipulated in the market guidelines by the NIC. Judging from the economic background of the policyholders, every single pesewa is valued dearly, hence any administrative process that unduly delays the settlement of valid claims may undermine the positive impacts of microinsurance on welfare. For example, in an emergency situation, microinsurance can prevent asset loss and emergency borrowing if valid claims are paid expeditiously.

Addressing the thorny issues surrounding insurance claims will also correct the negative perception that the public has about insurers. Appropriate market education targeted at the informal economy and risk-based supervision of insurers by the NIC can help to resolve some of these challenges.

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# CHAPTER 3

# THE IMPACT OF MICROINSURANCE ON HOUSEHOLD ASSET ACCUMULATION IN GHANA: AN ASSET INDEX APPROACH[18]

## 3.1. INTRODUCTION

The first of the Millennium Development Goals (MDGs) is to halve extreme poverty and famine across the world by the year 2015 (UN, 2010). Although the target period is just one year many developing nations are far off-track in achieving this objective. One major cause for this is that millions of the citizens of such countries do not have sufficient insurance cover and thus are very susceptible to the financial consequences of manifold risks such as illness, unemployment and old age (Loewe, 2006; Binnendijk *et al.,* 2012).

Risks impede the capacity of poor people from breaking the vicious cycle of poverty (Guha-Khasnobis & Ahuja, 2004). According to Churchill (2007:402), "poverty and vulnerability reinforce each other in an escalating downward spiral". Microinsurance can help the poor to deal with risk effectively by reducing uncertainties associated with losses (Brown and Churchill, 1999). It fulfills the needs of those previously excluded from formal insurance coverage by protecting them against the financial consequences of life-cycle risks (Dror & Jacquier, 1999). By insuring households against future welfare losses, microinsurance helps in the reduction of vulnerability and poverty. According to Dercon (2003), insurance removes the risk of worsening poverty or poverty traps. Unlike bank credit, microinsurance may not necessarily lead to the direct acquisitions of more assets, however, in the absence of microinsurance households may lose critical assets to risks. Thus one may assume that microinsurance facilitates stability and steady growth of household assets through the prevention of asset loss and the release of available savings for the acquisition of essential assets.

However the available evidence about the impact of microinsurance on household asset retention and accumulation is inconclusive. Whereas some studies discovered that microinsurance leads to counterintuitive tendencies such as moral hazard and adverse selection among microenterprises (Giné & Yang, 2009; Giesbert *et al.,* 2011), others argue that microinsurance facilitates microenterprises' investments into high yielding projects which improve their productivity and welfare (Nicola, 2011). Also the experience of Europe and America shows a positive relationship between insurance, savings levels and economic well-being (Starr-McCluer, 1996; Guariglia &

[18] This paper has been published in the *Geneva Papers on Risk and Insurance-Issues and Practice,* (2014) 39, 304–321. doi:10.1057/gpp.2014.6. An extract from this paper was also presented at the Economic Society of South Africa Biennial Conference, 25-27 September, 2013, University of the Free State, Bloemfontein, South Africa.

Rossi, 2004), but that of some Asian countries is said to be negative (Cheung & Padieu, 2011; Hsu *et al.,* 2011). The inconclusive empirical evidence from the various regions of the world and the many gaps in the existing literature calls for a very rigorous country-specific study that will test the real impacts of microinsurance on households' welfare.

This study provides new evidence by examining the impact of microinsurance on asset accumulation of low-income households in Ghana. In particular we ask: can microinsurance prevent asset loss and thus lead to asset accumulation among low-income households? Some microinsurance services have been operating in Ghana for the last decade, but the question of whether they have led to asset accumulation and enhanced welfare gains of households concerned, mostly in the informal sector, is largely unresearched. More importantly, when juxtaposed with the poverty situation in Ghana, it is imperative to ascertain whether the intervention of microinsurance schemes have helped in increasing welfare of beneficiaries. In this study we show that microinsurance can have a positive influence on households' asset accumulation and hence improves welfare.

We examine this research question by creating a composite asset index as a measure of household welfare. The use of the asset-index is not a novelty, it has been used quite extensively in the mainstream poverty or welfare literature to measure country-level poverty reduction efforts (e.g. see Sahn & Stifel, 2000; Booysen *et al.,* 2008; Njong & Ningaye, 2008; Echevin, 2011; Filmer & Scott, 2012; Harttgen *et al.,* 2013). The missing link in both the microinsurance and the mainstream welfare literature is this: the microinsurance literature has so far not used asset index as a measure of households' welfare[19] and the mainstream welfare literature has not assessed the effects of microinsurance usage on households' asset index. Practically, using household assets instead of income or expenditure to measure welfare levels is more accurate and reliable. The measurement of the income of households in the informal sector is hindered by seasonality, recall bias and households' reluctance to divulge sensitive information concerning their income and expenditure levels. Yet it is much easier for households to provide correct answers on asset ownership questions such as whether the household has radio, television, piped water, electricity etc. Thus the use of assets to measure welfare helps us to overcome the challenges associated with accurate measurement of income and expenditure.

The rest of the chapter is structured as follows: the relevant literature is reviewed in section 3.1; section 3.2 provides a brief overview of the microinsurance industry in Ghana; section 3.3 describes the methodology; section 3.4 discusses the results and section 3.5 provides conclusions and policy recommendations.

[19] Janzen and Carter (2013) created a non-livestock index and used it as an independent variable to estimate the impact of microinsurance on risk coping strategies of households in Kenya. The difference is that we are using the asset index as the dependent variable in our analysis.

## 3.2. LITERATURE REVIEW

### 3.2.1. The Theory of Insurance

The economic theory of insurance is based on the expected utility theory advanced by Von Neumann-Morgenstern. This theory assumes that the utility of a person is a concave function of wealth. This implies that risk averse individuals have a diminishing marginal utility of wealth (Frank, 2004) and so they buy insurance product in order to replace the uncertainty of incurring large financial loss (in the event of a shock) with the certainty of making regular premium payments (Mossin, 1968; Brown & Churchill, 1999). Thus insurance enables individuals to transfer risk from a state of uncertainty to another state of certainty.

It is however argued by psychologists that the risk transfer principle of insurance does not reflect actual behaviour because individuals actually seek for the risk of no loss at all, instead of the certainty of paying insurance premiums (Nyman, 1998). Therefore the reason people buy insurance is not to transfer risk, but as argued by Nyman (1998) to obtain extra income if the insurable loss occurs.

Despite the seemingly disagreements regarding the motive for insurance demand, the end effect of the two strands of the insurance theory indicates that insurance can increase welfare by preventing asset loss. The implication of these theories for low-income households – the target market of microinsurance – is that they may benefit from insurance in two ways: (1) by replacing the uncertainty of future loss with the certainty of paying small premiums; and (2) make a claim on additional income when the insurable risk occurs. As to whether this theoretical implication manifest in the lives of insured households is a matter of an empirical test.

### 3.2.2. Empirical Literature

The growth and development of the microinsurance market is still at the nascent stage with very little research into its impact on households' welfare. The few empirical studies about the microinsurance market in Ghana have tended to focus mainly on access to microinsurance rather than on the financial impact of microinsurance services. The evidence from other countries largely focused on micro health insurance (see Dong *et al.,* 1999; Gruber & Yelowitz, 1999; Gumber, 2001; Chou *et al.,* 2004; Wagstaff & Pradhan, 2005; Dror *et al.,* 2006).

Summaries of the available literature have been compiled by De Bock and Ontiveros (2013) and Dercon *et al*. (2008). De Bock and Ontiveros's compilation reveals three strands of literature about the impact of microinsurance on poor households. Whereas one group of researchers (Aggarwal, 2010; Fitzpatrick *et al.,* 2011; Mahal *et al.,* 2013; Binagwaho *et al.,* 2012) provides evidence of improved health and beneficial socio-economic impacts of microinsurance on poor households, others such as Gnawali *et al.* (2009) indicate otherwise. The third group of authors (Gumber, 2001;

Smith & Sulzbach, 2008; Wagstaff *et al.,* 2009; Lei & Lin, 2009; Dercon *et al.,* 2012) report either mixed results or no effect at all.

Dercon *et al.* (2008) explained that microinsurance services have a direct impact on the *ex-post* and *ex-ante* behaviours and decisions of households. Its positive effects on *ex-post* risk coping strategies enables individuals and small business entities to maintain a stable consumption pattern and avoid asset loss. Dercon *et al.* (2008:8) further assert that "the impact of microinsurance on consumption, assets or other dimensions of welfare (such as health, nutrition, school enrolment) is a useful indicator to investigate the role of microinsurance in allowing individuals to avoid further poverty and hardship".

Wagstaff and Pradhan (2005) investigated the impact of health insurance on health outcomes, health care utilization and non-medical consumption expenditure for households in Vietnam. The results of their study revealed a positive influence of health insurance on height-for-age and weight-for-age of young school children. They also showed that micro health insurance has led to a rise in households' consumption of non-medical services and goods. The study further indicates a decrease in precautionary savings meant for out-of-pocket health expenditures.

Janzen and Carter (2013) employed difference-in-difference, matching, Heckman sample selection and instrumental variables techniques to evaluate the impacts of microinsurance on households' asset accumulation and human capital investments in Kenya. Their findings indicate: (1) insured households are about 50 percent less likely to sell off livestock to cope with severe drought; (2) the insured households are about 36 percent less likely to forgo food as a coping strategy. This reduces the incidence of malnourishment among insured households; and (3) insured households are about 50 percent less dependent on food aid and external support. They concluded that microinsurance protects households against the liquidation of productive assets and reduction of meals. Thus microinsurance reduces the tendency of engaging in harmful behaviours which have long-term adverse consequences on wealth and human capital development.

Mosley (2009) reports that microinsurance improves clients' loan repayment rates and has a direct impact on physical and human capital expenditures. That is, since the microinsured rely less on emergency borrowing, their expenditure levels are more predictable and reliable. Evidence provided by Levine and Polimeni (2012) and Dercon *et al.* (2008) confirm Mosley's findings that microinsurance reduces emergency borrowing.

With the aid of ordinal probit regression, Morsink *et al.* (2011) analysed the impact of microinsurance on 215 households in the Philippines. Their findings indicate that microinsurance reduces vulnerability and lowers the households' probability of falling into a poverty trap. Similarly,

Hamid *et al.* (2010) argue that microinsurance has a significant impact on household food sufficiency.

As a result of the stability in income flow and expenditure alluded to by Mosley, clients of (micro) insurance are theoretically expected to save more than those without coverage. Although Hsu *et al*. (2011) agree to this theoretical foundation of a positive impact of insurance on saving, they disagree with it on the basis of contrary empirical evidence. Specifically, Hsu *et al*. (2011) argued that in countries where the social welfare system is small, households covered by insurance save less than those without coverage.

Another study from the Asian region, specifically on China by Cheung and Padieu (2011) confirms the results of Hsu *et al* (2011). In particular, Cheung and Padieu (2011) posit that even though health insurance may facilitate household consumption, it reduces savings. They also claim that health insurance does not have a significant impact on poverty reduction.

However, other empirical studies from the West, especially in the USA and UK, have provided evidence which contradicts that of the Asian region. For instance, Starr-McCluer (1996) showed that households in the USA who have taken health insurance policies save more than those without coverage. This finding has been supported by Guariglia and Rossi (2004) in a similar study of the UK insurance market.

Even though the literature suggests that microinsurance may have positive impacts on low-income households, there are clearly significant gaps in the existing literature. Important questions have not been answered, especially questions regarding how microinsurance is used by low-income earners to protect their assets against financial shocks have not been dealt with.

### 3.3. OVERVIEW OF THE MICROINSURANCE INDUSTRY OF GHANA

Ghana has performed relatively well in the fight against extreme poverty. The percentage of people living on less than US$1.25 a day declined from 51.7 percent in 1991 to 28.5 percent in 2006 (GSS, 2008). The most recent living standards survey reports of a further decline in the poverty rate to 24.2 percent (GSS, 2014). Nevertheless, poverty is still widespread, with an estimated 10.6 percent of urban and 37.9 percent of rural dwellers living below the poverty line (GSS, 2014; UNDP, 2011). Also, the rates of poverty of the three northern regions and rural areas within the savannah belt are above the national average.

Among the efforts to accelerate the reduction of poverty to the minimum level is the rolling out of microinsurance schemes by the government and private insurers. Microinsurance is the provision of insurance services to low-income households mostly living and working in the informal sector. It covers low-income persons against specific risks in exchange for premium payments. Most of the

microinsurance schemes on the Ghanaian markets are provided by subsidiaries/agencies of commercial insurance companies in partnership with microfinance institutions to low-income households. The difference between the microinsurance schemes and the "formal" insurance services is the structure of the premium payments, levels of premiums, distribution channels and the target market. The premium payment is structured according to the traditional *susu*[20] mechanism, under which the insurance agents undertake regular visits (say three times a week) to the work place or house of the policyholders to collect the premiums. Although the premiums are in proportion to the probability and cost of the risk involved, they are relatively affordable, ranging from GHS1.00 to GHS10.00 (US$0.33 to US$3.33) per month. Another unique feature of the microinsurance schemes is its community based distributions channels through nodal agencies such as local churches, microfinance institutions, community or rural banks, NGOs and market women associations. The flexibility in the distribution and the premium payments is the backbone of the extension of microinsurance to low-income households. Table 3.1 presents the different distribution channels of microinsurance companies in Ghana and the level of outreach in terms of policies sold (Buabeng & Gruijters, 2012).

**Table 3.1: Distribution Models and Policies Sold, 2011**

| Distribution Models | Total Policies Distributed |
|---|---|
| Direct Sales (Company Agents) | 24 668 |
| RCBs and MFIs | 343 243 |
| Telecoms Providers | 302 194 |
| Nodal Societies: | |
| Churches | 13 116 |
| Others | 1 857 |

Source: Buabeng and Gruijters, 2012; NIC and GIZ, 2012.

### 3.3.1. Examples of Private Microinsurance Schemes

Through policy facilitation by the National Insurance Commission, many commercial insurers have shown increased interest in getting further involved in microinsurance provision. Some providers who have been able to partner with rural banks to provide the microinsurance services at the grassroots have increased their market shares and are beginning to reap the benefits of economies of scale. For instance, Gemini Life Insurance Company's (GLICO) *Anidaso*[21] *Policy*, which is distributed through 26 rural banks, has been able to expand its operations to five of the ten regions of Ghana. This has helped the company to increase the number of its policyholders by 471 percent from 14 000 in 2005 to 80 000 in 2009.

[20] The regular contribution of smaller amounts of money towards a specified target.
[21] Anidaso means hope.

The Anidaso Policy was developed by GLICO with technical assistance from CARE International in 2003 to meet the insurance needs of low income earners. It is a term insurance plan and is offered as a joint product with the Edwa Nkosuo[22] product. The Anidaso policy and the Edwa Nkosuo product together provide a savings avenue and insurance protection for low-income households and SMEs at very affordable premiums. The Anidaso Policy can be taken out as a stand-alone policy or together with the savings benefit. It covers the life of the policyholder and his/her immediate dependants such as spouse. Other benefits of the policy include hospitalization income, accident and disability benefits.

MicroEnsure is acting as an agent of commercial insurance companies to provide microinsurance services to SMEs and the poor. Its main products are Obra Pa, Tigo Family Care and savings-linked policies. The Obra Pa policy covers credit life, fire, flood and property loss. The Tigo[23] Family Care policy extends life microinsurance cover to subscribers of Tigo depending on the amount of airtime used within a month. In addition to the airtime usage, policyholders are required to pay GHS1 (US$0.33) per month for (optional) life cover. The savings-linked provides life cover to a depositor who saves a minimum of US$25 per month in specified banks/microfinance firms. The life cover benefits increases with the level of savings made over a specified period (www.microensure.com).

The schemes which have been included in this study fall within at least two areas of our operational definition of microinsurance. That is, (1) the premiums are structured to meet the seasonal cash-flow of low-income households; (2) cost of premiums range from less than GHS1.00 to GHS10.00 (UD$0.33 to UDS$3.33) per month; (3) the scheme is distributed very widely at the grassroots by churches, microfinance firms, NGOs and registered agents.

## 3.4. THE METHODOLOGY

### 3.4.1. The Data

The nation-wide household data collected by Finmark Trust (FINSCOPE)[24] with support from the World Bank and UKAid in 2010 was used for this study. One of the objectives of the survey is to aid researchers to undertake impact evaluation of financial services on the Ghanaian market (Finmark Trust, 2010). Stratified multi-stage random sampling comprising geographically enumerated areas (regions, urban and rural) and households were used by the survey. The survey adopted face-to-face interviews and questionnaires to gather the data from 3 643 households in Ghana. The survey collected comprehensive data about households' demographic features, asset ownership, economic conditions, social backgrounds, access to public infrastructure, financial

[22] Edwa Nkosuo means successful market.
[23] Tigo is a mobile telecommunication company.
[24] A plausible dataset would have been the GLSS, however the GLSS (as at the time of the research) did not have information on private microinsurance

status, financial knowledge and risk management, perception about financial institutions and usage of financial products and remittances.

In terms of access to financial services, the dataset can broadly be classified into three sectors: (1) access to formal financial services – notably commercial banks, stock market etc.; (2) access to *other* formal and informal financial services – microfinance, savings club, *susu* schemes, insurance companies, retail credit providers, remittance service providers; and (3) no access at all. For the purpose of this study we extracted the dataset concerning households in the informal and *other* formal sectors for the analysis. As a result 682 observations comprising 438 insured and 244 uninsured households were extracted for the study. The 438 insured households is an aggregate of the products presented in Table 3.2. The ideal situation is to treat each microinsurance product separately in the regression estimation. However none of the products has the required observations to aid regression analysis appropriately. Nevertheless, the aggregation has no adverse effect on our analysis because the focus of the study is not on specific products, but rather on the comparison between insured and uninsured cohorts.

**Table 3.2: The Number of Insured Households**

| Microinsurance Product | No. Observations |
|---|---|
| Life | 73 |
| Property | 62 |
| Funeral and others | 26 |
| Education | 23 |
| Retirement and investment | 19 |
| Health (private) | 28 |
| Health (public; NHIS) | 368 |
| **Total*** | **599** |

Note*: The total is more than the 438 insured households because some clients have more than one product.

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Source: Author's computation based on the 2010 FINSCOPE Data of Ghana.

### 3.4.2. The Profile and Characteristics of Households

In order to be sure that we are dealing with households with relatively similar characteristics we present a chi-square test[25] on the socio-economic characteristics for both insured and uninsured households. Whereas the insured has more access to the credit market, the uninsured receives more remittances. Also the insured appears to have a larger family size and has attained secondary educational level. Apart from these (credit, remittances, education), the trend observed

[25] The chi-square test was used for the categorical variables while the t-test was used for the continuous variables.

across the variables suggests that the insured and uninsured households are not significantly different from each other in terms of their characteristics, living conditions, economic activities and income levels.

**Table 3.3: Chi-Square Test on the Profile of Insured and Uninsured Households**

| Variable | Uninsured HH (%)[C] | Insured HH (%)[C] | Chi-Square ($\chi^2_{.050}$) |
|---|---|---|---|
| Resp. Age[T] (mean years) | 38.02 | 39.81 | -1.7918 (0.0652) |
| ***Resp. Gender*** | | | 0.1014 (0.750) |
| Male | 47.13 | 48.40 | |
| Female | 52.87 | 51.60 | |
| ***Resp. Marital Status*** | | | 2.2049 (0.138) |
| Married | 51.65 | 57.57 | |
| Others | 48.35 | 42.43 | |
| ***Resp. Education Level*** | | | 8.4240 (0.015)** |
| No formal Education | 13.17 | 7.78 | |
| Primary Education | 45.27 | 40.96 | |
| Secondary and above | 41.56 | 51.26 | |
| ***Household Income*** | | | 0.4930 (0.782) |
| 0 – GHS400 | 69.31 | 66.36 | |
| GHS401 – GHS1000 | 24.87 | 26.97 | |
| Above GHS1000 | 5.82 | 6.67 | |
| HH Size[T] (mean size) | 3.418 | 4.004 | -0.586 (0.0034)*** |
| ***House Ownership*** | | | 0.2135 (0.899) |
| Rented | 32.79 | 34.47 | |
| Family Owned | 48.36 | 46.80 | |
| Occupied without payment | 18.85 | 18.72 | |
| ***Location*** | | | 0.0023 (0.962) |
| Urban | 68.44 | 68.26 | |
| Rural | 31.56 | 31.74 | |
| ***Economic Activity*** | | | 0.3053 (0.581) |
| Farming Enterprise | 29.92 | 31.96 | |
| Non-Farming Enterprises | 70.08 | 68.04 | |
| ***Proximity to Financial Inst*** | | | 0.1176 (0.732) |
| 10 – 30 min. walk | 69.23 | 67.62 | |
| Above 30 min. walk | 30.77 | 32.38 | |
| ***Access to Credit*** | | | 5.1651 (0.023)** |
| Never borrowed | 54.51 | 45.43 | |
| Have Borrowed | 45.49 | 54.57 | |
| ***Remittances*** | | | 7.4542 (0.006)*** |
| Do not Receive Remittance | 52.92 | 63.68 | |
| Receives Remittances | 47.08 | 36.32 | |

Note: *** and ** indicate 1 and 5 percent significance levels respectively; [C] indicates that the addition for each variable is by columns; [T] indicates T-test instead of Chi-square.
Source: Author's computation based on the 2010 FINSCOPE Data of Ghana

### 3.4.3. The Estimation Techniques

The ideal empirical technique is to draw a comparison between a group of households' assigned microinsurance "treatment" randomly and a control group lacking access to it (Janzen & Carter, 2013). However microinsurance services are now ubiquitous in Ghana. Thus the fact that microinsurance products were not assigned randomly and their widespread nature limit our option of using a pure control group to evaluate the impact of microinsurance on households' asset

accumulation. So the empirical framework in this study is confined to a sample population in which all households have access to microinsurance services, but where some households decided not to take up these services. The option to take up these services creates self-selection and endogeneity problems which can blur the actual impact of microinsurance, hence the estimation is done to account for selection bias issues by estimating Heckman sample selection and treatment effect models.

#### *3.4.3.1. The Heckman Sample Selection Model*

Heckman's (1974, 1978 and 1979) model for sample selection has made essential contributions to the estimation of impact evaluations. The model which is designed for evaluating nonrandomized programs uses a two-step estimation approach to correct for participants' self-selection bias and selection bias due to program placement (Heckman, 1979). These two-step equations are the selection equation and the outcome (regression) equation.

In the first stage (the selection equation), we run a probit model for microinsurance on factors that determine the uptake of microinsurance. The probit function for microinsurance is a dummy variable which takes the value of one (1) if household *i* has taken up microinsurance and zero (0) otherwise. This is given as follows:

$$INSURE_i = \begin{cases} 1 \; if \; household \; i \; has \; microinsurance \\ 0 \; if \; household \; i \; never \; had \; microinsurance \end{cases} \quad 3.1$$

The first-step equation or the selection equation is thus given as:

$$INSURE_i = z_i\delta + \mu_i \quad 3.2$$

Where $Prob(INSURE_i = 1|z_i) = \Phi(z_i\delta)$ and $Prob(INSURE_i = 0|z_i) = 1 - \Phi(z_i\delta)$

Where $z_i$ is a vector of exogenous variables determining treatment (the uptake of microinsurance) and $\boldsymbol{\Phi}(\cdot)$ is the standard normal cumulative distribution function and $\mu_i$ is the error term. The inverse Mills ratio is then constructed from the estimated coefficients of the probit model. The inverse Mills ratio, also referred to as 'hazard lambda' or 'control function', controls for selection bias and accounts for the omitted variables or the unexplained variations in the error term. The inverse Mills ratio is given as:

$$\lambda_i = \frac{\phi(z_i\hat{\delta})}{\Phi(z_i\hat{\delta})} \quad 3.3$$

Where $\boldsymbol{\lambda_i}$ is the inverse Mills ratio, $\boldsymbol{\phi}$ is standard normal density function, and $\boldsymbol{\Phi}$ is as defined in the probit model above. In the second step, the outcome equation (that is, the impact of microinsurance on asset accumulation) is then estimated with the inverse Mills ratio as an additional independent variable (Lin, 2007; Janzen & Carter, 2013).

$$AST_i = \beta_0 + \beta_1 INSURE_i + \beta_2 \lambda_i + \varepsilon_i \quad 3.4$$

Where $AST_i$ is the asset index, the error terms ($\boldsymbol{\mu_i}$ and $\boldsymbol{\varepsilon_i}$) of both the selection and the outcome equations are bivariate normal with mean zero.

#### *3.4.3.2. The Treatment Effect Model*

In the treatment effect model a binary variable representing the treatment condition *INSURE*$_i$ that is *INSURE*$_i$ = 1 if household *i* is insured (received "treatment") and *INSURE*$_i$ = 0 if household *i* is uninsured (not "treated") is directly captured in the outcome equation and thus the outcome variable – the asset index – is observed for both the treated and the untreated. The selection and outcome models are specified in equations (5) and (6) respectively.

$$INSURE_i^* = z_i\delta + \mu_i, INSURE_i = 1 \; if INSURE_i^* > 0, and \; INSURE_i = 0 \; otherwise \quad 3.5$$

$$AST_i = x_i\beta + INSURE_i\gamma + \varepsilon_i \quad 3.6$$

Where $\mu_i$ and $\varepsilon_i$ are the error terms which are bivariate normal with zero mean. Since $INSURE_i$, is an endogenous binary variable and given the assumption of sample selection, the impact evaluation under this model uses the observed features of households to estimate the parameters of β and also to account for selection bias due to non-ignorable placement of the insurance service. In order to obtain the regression models for the two regimes, the treated and the untreated, we substitute *INSURE*$_i$ in equation (3.6) with equation (3.5) as follows:

When $INSURE_i^* > 0, INSURE_i = 1: AST_i = x_i\beta + (z_i\delta + \mu_i)\gamma + \varepsilon_i$ 3.7

And when $INSURE_i^* \leq 0, INSURE_i = 0: AST_i = x_i\beta + \varepsilon_i$ 3.8

This implies that for treated households the outcome equation is $AST_i = x_i\beta + (z_i\delta + \mu_i)\gamma + \varepsilon_i$ and for the untreated households the outcome equation is $AST_i = x_i\beta + \varepsilon_i$. These two equations are estimated in a two-step approach just like the Heckman model.

#### *3.4.3.3. The Instrumental Variable Model*

Although the Heckman sample selection and the treatment effects models may help us to control for selection bias, the uptake of microinsurance service may be influenced by certain unobserved features such as fear, motivation or entrepreneurial skills (Janzen & Carter, 2013). Hence we use instrumental variable (IV) model not only to capture the unobserved variables, but also to check the

consistency and the rigor of our estimates. As noted by Janzen and Carter (2013:10), the IV accounts for "endogenous insurance participation".

To address the challenge of endogeneity bias, the IV model demands the usage of an observed variable that is (1) correlated with the uptake of microinsurance; and (2) uncorrelated with the error term or the unobserved factors influencing asset accumulation. We selected three instruments, namely insurance identity card, proximity to insurance company and whether or not one has heard of an insurance product. The uptake of microinsurance is highly correlated with one's knowledge about insurance (e.g. see Akotey *et al.,* 2011) and the proximity to an insurance firm has the potential of reinforcing households' awareness of microinsurance services. The insurance identity card is also a pre-requisite for all households intending to take up insurance, especially the health insurance scheme. Thus these three instruments have direct and substantial correlation with a decision to buy microinsurance, but with little or no association with asset accumulation.

Following the theoretical exposition of Wooldridge (2002) about IV, we used these instruments to estimate the local average treatment effect of microinsurance on households' asset index. Similar steps of the treatment effect model above and the IV's two-stage least squares were used to obtain the estimations of the IV model.

It is noteworthy that the analysis of impact evaluation involves the estimation of several models such as OLS, Heckman sample selection, treatment effect model and instrumental variables (direct-2SLS, IVprobit and probit_2SLS). However some of these have problems with bias and consistency. For instance, the OLS does not address the problems of selection and endogeneity biases. Though the instrumental variable model can deal with the problems of endogeneity bias, the IVprobit (a variant of the IV model) is designed to fit a model with a binary dependent variable and a continuous endogenous variable which is not the case in this study. Hence the estimates of the IVprobit were dropped. Therefore only the models that yield the most consistent and robust results have been reported. These are Heckman sample selection, treatment effect model and instrumental variable modelling (direct-2SLS and probit-2SLS)[26] have been reported.

### 3.4.4. The Construction of the Asset Index

An asset index is a welfare composite indicator constructed from specific underlying households' assets (Johnston & Abreu, 2013; Booysen *et al.,* 2008). Hence, an asset index $AST_i$ is a function of specific underlying variables (properties) $P_{ij}$, such that $P_{ij}$ represents household *i*'s ownership or lack of asset/property *j.*

$$AST_i = f\{P_{ij}\} \qquad 3.9$$

[26] The direct-2SLS was used to estimate the results of Chapters 3 and 6 while the probit-2SLS was used to estimate the results of Chapter 4.

This is expanded as: $AST_i = P_{i1} + P_{i2} + \ldots + P_{im}$ 3.10

Where $P_{ij}$ is a binary or categorical variable and takes the value 1 if household *i* owns asset *j*, and 0 if otherwise. Following the methods of Benzecri (1973), van Kerm (1998), Booysen *et al.* (2008), Asselin (2009) and Echevin (2011), the weights of the individual assets were then computed using multiple correspondence analysis (MCA). The basic form of the asset index is given as:

$$a_i = \sum_{k=1}^{k} F_{1k}\, d_{ki} \quad 3.11$$

The *i*th household asset index is $a_i$, $d_{ki}$ is the *k*th value of the categorical variables (with k=1,…, K) indicating the households' assets variables included in the index construction. $F_{1k}$ is the MCA weights generated for the analysis. The extended form of the asset index for this study is given as:

$$AST_i = P_{i1}W_1 + P_{i2}W_2 + \cdots P_{ij}W_j \quad 3.12$$

Where $AST_i$ is the welfare composite index of household *i,* the response of household *i* to category/asset *j* is represented by $P_{ij}$ and $W_j$ is the MCA weight for dimension one applied to category *j* (Booysen *et al.,* 2008).

### 3.4.5. Justification of the Control Variables

#### *3.4.5.1. Household Characteristics*

Personal characteristics of a household head and the living conditions of the household can influence the demand for microinsurance. In particular age is an important determining factor for the uptake of micro life insurance policies. As observed by Arun *et al.* (2012), older households increase their demand for life insurance in order to indemnify their family in the event of death. The effect of age on other types of microinsurance is however mixed. For instance, whereas Gaurav *et al.* (2011), Dercon (2011) and Jehu-Appiah (2011) have indicated that older persons are more likely to increase their demand for insurance schemes, Cole *et al.* (2013) found mixed results for selected villages in India. So we expect the age of the household head to have either a direct or indirect correlation with the uptake of microinsurance.

Gender is also reported to have mixed effect on the demand for microinsurance. Jehu-Appiah *et al.* (2011) and Owusu *et al.* (2012) report from studies on Ghana that females are most likely to buy microinsurance products. This may be due to the fact that pregnancy and childbearing exposes females to more risks than males (Banthia *et al.,* 2009). However, Schneider and Diop (2004), De Allegri *et al.* (2006) and Bonan *et al.* (2011) have indicated that males are more likely to demand microinsurance than females. Marriage has also been found to exert a positive influence on the demand for microinsurance as married couples tend to cover their children against socio-economic

risks. In addition the size of a household has been shown to increase the uptake of microinsurance (Chankova *et al*., 2008; Nketiah-Amponsah, 2009).

Many empirical works have reported a positive link between level of education and microinsurance demand especially health insurance (Chankova *et al.* 2009; Brugiavini & Pace, 2011; Jehu-Appiah *et al.,* 2011). However, Akotey *et al.* (2011) provide evidence that the level of education do not have a significant effect on microinsurance demand. They argue that one's years of schooling is not enough to lead to the purchase of microinsurance, but rather one's knowledge or awareness about microinsurance is the most vital factor for microinsurance demand.

An individual's level of income and wealth is expected to enhance the likelihood for microinsurance demand. For instance, Akotey *et al.* (2011) report that income has a positive significant influence on the demand for microinsurance. Similarly Bhat and Jain (2006), Hwang and Gao (2003), Jehu-Appiah *et al.* (2011) and Nketiah-Amponsah (2009) have shown that income and wealth have positive correlation with insurance demand.

In terms of asset accumulation, these personal characteristics: age, education, income and being married, are expected to have a positive correlation with increase stock of household assets. However, household size may lead to lower asset build up if many of the household members are dependents (especially children and elderly persons) and thus do not earn income.

#### *3.4.5.2. Risk Profiles*

According to the expected utility theory, the aversion for uncertain outcomes induce risk averse individuals to buy insurance to protect themselves against the uncertainty of incurring future financial losses. We thus expect the risk profiles of households to have a positive association with microinsurance demand.

#### *3.4.5.3. Interaction with the Financial Institutions*

Under this we look at the interactions between households and financial institutions especially insurance companies and how such interactions influence the demand for microinsurance. For instance, the proximity of households to a financial institution can enhance their awareness and knowledge about microinsurance schemes. This may thus lead to the take up of microinsurance services. Prospective policyholders are also required to provide certain documents as part of the conditions for buying microinsurance. The nature of such documentation and legal requirements can either enhance or discourage the demand for microinsurance. According to Dror and Jacquier (1999), the simplicity of the procedure for joining a microinsurance scheme and for making claims can enhance the purchase of microinsurance. Due to this the market guidelines of NIC (2011) requires microinsurance providers to make microinsurance contract very simple to understand with

less legalese and no or few exceptions. It further requires claims to be dealt with expeditiously within 7 to 10 days.

Trust is also another interactive variable that can influence the perception of households about the ability of insurers to pay valid claims when the need arises. The trust that policyholders have in insurers, in the product itself and in peers (Patt *et al.,* 2009) can have a great deal of influence on the uptake of microinsurance (De Allegri *et al*., 2006; Bhat & Jain, 2006; McCord, 2008; Akotey *et al.,* 2011; Cole *et al*., 2011; Dercon *et al*., 2011).

The price of microinsurance products is the most important variable that influences the decision of many low-income households to buy microinsurance. It has also been argued by several studies that the crucial aspects of price as far as microinsurance is concerned are affordability of premiums in terms of absolute levels and periodicity of payments (Dror & Jacquier, 1999; Churchill, 2007; Akotey *et al.,* 2011). Therefore aligning insurance premiums payments with the uneven cash flow and relatively low income levels of households living and working in the informal sector can lead to high demand for microinsurance products.

#### *3.4.5.4. Trade Credit and Microcredit*

Trade credit allows households owning small enterprises such as petty traders and smallholder farmers to buy certain items including household assets on credit. On the other hand, microcredit is small loans given to households by microfinance institutions for the financing of household assets, consumption smoothing and for productive purposes. It is therefore expected that trade credit and microcredit can lead to the accumulation of more assets.

#### *3.4.5.5. Economic Activity*

The economic activities of low-income households can be categorised into farm-based and non-farm based enterprises. The farm-based include smallholder farmers, fishmongers, fruits and vegetables sellers while the non-farm enterprises consist of dressmakers and tailors, carpenters, truck pushers, “head-porters”, chop-bar operators and provisions sellers.

The GLSS VI (GSS, 2014) reports that the incidence of poverty is highest among households engaged in farm-based enterprises while those involved in non-farm businesses are less likely to be poor. It is thus expected that households engaged in farm-based enterprises may accumulate less assets than those involved in non-farm enterprises. They may however be able to achieve better food consumption smoothing since they are involved in subsistence farming.

#### *3.4.5.6. Rural and Urban Locations*

Both the GLSS V and VI Reports (GSS, 2008 & 2014) indicate that poverty in Ghana is still a disproportionately rural phenomenon. It has also been argued severally that rural dwellers are unambiguously disadvantaged in terms of acquisition of critical assets for welfare enhancement (see e.g. Sahn & Stifel, 2003; Ravallion *et al.,* 2007; Booysen *et al.,* 2008; Echevin, 2011). It is therefore expected that rural households may have low level of assets, high asset inequality and poor smoothing of consumption.

## 3.5. DISCUSSION OF THE RESULTS

### 3.5.1. Test for Multicollinearity: Correlation Analysis

The strength of relationship among the explanatory variables can influence the validity of the estimations. A correlation matrix is thus estimated to test for multicollinearity and the robustness of the regression results. The correlation matrix presented in Table 3.4 shows strong multicollinearity of 82 percent between private microinsurance and government microinsurance. Hence we have dropped the government microinsurance from the empirical analysis.

**Table 3.4: Correlation Matrix**

| Variables | AST | P.MI | G.MI | Marital | Age | Gender | Edu | HH.Siz | HH.Siz≥15yrs | Income | Non-Farm | Tradecredit | Credit | Rural | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AST | 1.00 | | | | | | | | | | | | | | |
| Private MI | 0.10 | 1.00 | | | | | | | | | | | | | |
| Gov't MI | 0.02 | 0.82 | 1.00 | | | | | | | | | | | | |
| Marital | 0.07 | -0.05 | -0.05 | 1.00 | | | | | | | | | | | |
| Age | -0.11 | 0.09 | 0.06 | -0.19 | 1.00 | | | | | | | | | | |
| Gender | 0.05 | 0.02 | 0.04 | 0.09 | -0.03 | 1.00 | | | | | | | | | |
| Education | 0.52 | 0.15 | 0.11 | 0.09 | -0.19 | -0.16 | 1.00 | | | | | | | | |
| HH.Siz | -0.22 | 0.11 | 0.11 | -0.14 | 0.03 | 0.03 | -0.19 | 1.00 | | | | | | | |
| HH.Siz≥15yr | -0.03 | 0.06 | 0.04 | -0.08 | 0.07 | 0.00 | -0.09 | 0.71 | 1.00 | | | | | | |
| Income | 0.12 | -0.07 | -0.09 | 0.17 | -0.14 | 0.13 | 0.01 | 0.04 | 0.08 | | 1.00 | | | | |
| Non-Farm | 0.44 | -0.06 | -0.07 | 0.17 | -0.20 | 0.17 | 0.22 | -0.18 | -0.08 | | 0.14 | 1.00 | | | |
| Tradecredit | 0.13 | -0.05 | -0.09 | 0.05 | -0.05 | 0.04 | 0.03 | 0.04 | 0.08 | | 0.08 | 0.10 | 1.00 | | |
| Credit access | -0.01 | 0.10 | 0.11 | -0.06 | 0.03 | -0.08 | 0.06 | 0.03 | 0.01 | | -0.11 | -0.04 | -0.26 | 1.00 | |
| Rural | -0.52 | 0.01 | 0.04 | -0.07 | -0.03 | -0.07 | -0.19 | 0.14 | -0.01 | | -0.11 | -0.34 | -0.05 | -0.07 | 1.00 |

Source: Author's computation based on the 2010 FINSCOPE data of Ghana

Note: AST = Asset index; Private MI (P.MI) = Private micro-insurance; Gov't MI (G.MI) = Government micro-insurance; Edu = education; HH.Siz = Household size.

### 3.5.2. The Summary Statistics

Tables 3.5 and 3.6 respectively report the descriptive statistics and percentile distributions of the asset index. Although the uninsured households have higher maximum assets, their average asset holding (mean) is lower than that of insured households. Both households have a negatively skewed asset distribution, an indication that majority of the households have assets worth insuring. However, one group of households (the uninsured) chose not to take up the microinsurance policies offered. Some of the reasons underlying their inability to buy microinsurance policies (as captured by the survey) are: (1) inability to afford the premium payments; (2) lack of knowledge about how insurance functions; (3) no need for insurance since risk are destined by providence; and (4) lack of trust in insurers.

**Table 3.5: Descriptive Statistics of the Asset Index**

| Statistic | Insured Households | Uninsured Households |
|---|---|---|
| Mean Asset Holdings[27] | 2.8629 | 2.6777 |
| Skewness | -0.5783 | -0.3953 |
| Kurtosis | 2.6130 | 2.3310 |
| Standard Deviation | 0.9774 | 1.0321 |
| Minimum | 0.3197 | 0.0026 |
| Maximum | 4.3930 | 4.4946 |
| Observations | 438 | 244 |

Source: Author's computation based on the 2010 FINSCOPE dataset of Ghana.

The percentile distribution indicates that the insured households at the bottom percentile levels (1% to 25%) have relatively more assets than the uninsured households. Both households' asset holdings however converge at the top from the 90$^{th}$ to 99$^{th}$ percentile.

**Table 3.6: Percentile Distribution of the Asset Index**

| Percentile | Insured Households | Uninsured Households |
|---|---|---|
| *Bottom Percentiles* | | |
| 1% | 0.5459 | 0.3714 |
| 5% | 0.9520 | 0.9027 |
| 10% | 1.2998 | 1.0402 |
| 25% | 2.2846 | 1.9644 |
| *Medium Percentile* | | |
| 50% | 3.0253 | 2.8569 |
| *Top Percentiles* | | |
| 75% | 3.5449 | 3.4357 |
| 90% | 4.0808 | 3.9559 |
| 95% | 4.2464 | 4.2464 |
| 99% | 4.3343 | 4.3343 |

Source: Author's computation using the 2010 FINSCOPE data of Ghana

[27] The mean is the average units of physical assets owned by a household.

### 3.5.3. The Empirical Results

The first step estimation to obtain the estimates for the inverse Mills ratio for the correction of sample bias is outlined in Table 3.7. The education level of the household head and family size has a significant positive effect on the uptake of microinsurance. A large family size may induce microinsurance uptake in order to avoid the tendency of drawing down on scarce savings to meet hospital bills and cope with other risks. Similarly, the two risk profile variables – threat to income and death of breadwinner – are positive and significant. This may imply that households who have experienced these risks in the past are most likely to take up microinsurance cover. Among the three potential instruments, proximity to financial institution (including insurance) is not statistically significant. It was therefore dropped, and insurance ID card and knowledge about insurance will be used for the IV estimation.

**Table 3.7: The Results of the Probit Model**

| Microinsurance | Coeff | Std. Error | P-Value |
|---|---|---|---|
| ***HH Characteristics*** | | | |
| Marital | -0.1517 | 0.1309 | 0.247 |
| HH Size | 0.0783 | 0.0406 | 0.054* |
| Age | -0.0070 | 0.0233 | 0.765 |
| Age Square | 0.0001 | 0.0002 | 0.759 |
| Male | -0.0948 | 0.1256 | 0.451 |
| HH Income | 0.0028 | 0.0015 | 0.062* |
| *Edu_Ref_No Formal Edu* | | | |
| Primary Education | -0.0826 | 0.2372 | 0.727 |
| Secondary Education | 0.1078 | 0.2657 | 0.685 |
| Tertiary Education | 0.4791 | 0.2674 | 0.073* |
| *Location_Ref_Urban* | | | |
| Rural | -0.0551 | 0.1348 | 0.682 |
| ***Risk Profile*** | | | |
| Threat_Income | 0.0207 | 0.0075 | 0.006*** |
| Death_Breadwinner | 0.0869 | 0.0328 | 0.008*** |
| ***Interactions with Financial Institutions*** | | | |
| Knowledge_Insurance | 0.4523 | 0.1413 | 0.001*** |
| Insurance ID Card | 1.9181 | 0.1361 | 0.000*** |
| Cost (Premiums) | -0.0432 | 0.0208 | 0.038** |
| Requirement_Financial_Inst | 0.0174 | 0.0229 | 0.446 |
| Proximity_Fin_Inst. | 0.0105 | 0.0078 | 0.180 |
| Trust_Financial_Inst | 0.0336 | 0.0328 | 0.305 |
| Constant | -2.6937 | 0.7916 | 0.001*** |
| *Observations* | *676* | | |
| *Prob >Chi2* | *0.000* | *Pseudo R-Sq.= 0.35* | |

Note: ***, ** and * represent 1, 5 and 10 significance levels respectively.

Source: Author's computation based on 2010 FINSCOPE data of Ghana.

The detailed results of the three estimation techniques are presented in Table 3.8. Each model makes a unique contribution to the whole impact evaluation. They do not necessarily address the same issues, however their combined effects facilitate impact outcomes which are rigorous and resilient. For instance, the Heckman model resolves the problems of selection bias by using the observed variables of only the treatment group for the estimation. The treatment effect model moves the Heckman model further in two ways: (1) it accounts for selection bias through the inverse Mills ratio (hazard lambda); and (2) it undertakes the estimation for both the treatment and control groups simultaneously. The results show a statistically insignificant inverse Mills ratio (hazard lambda): an indication that the sample size does not suffer from selection bias. The result of the treatment effect model indicates a significant positive impact of microinsurance on household asset accumulation. This suggests that microinsurance may equip low-income households to prevent asset loss and thus accumulate more assets.

Even though selection bias, as reported by the inverse Mills ratio (hazard lambda), is not associated with our sample and thus may not blur the findings, we still have cause for concern about crucial unobserved variables such as motivation, risk appetite and entrepreneurial passion which may influence the demand for microinsurance and its subsequent impacts. However, the Heckman and treatment effect models are not able to account for such situations. The IV corrects this shortcoming by capturing the essential unobserved variables and account for the endogeneity bias inherent in microinsurance uptake. The IV results indicate that microinsurance has a positive impact at the 5 percent significance level on households' asset accumulation. That is, the insured households stand a better chance of preventing asset loss and thus increase their asset holdings by about 19 percent.

All together these findings imply that having microinsurance cover reduces asset loss and enhances welfare. This is in line with the assumption that microinsurance prevents asset loss and promotes households' asset growth and stability due to the indemnity under the insurance cover. As noted by Smith (1998), depletion of accumulated assets is the most likely first step to cope with life-cycle risks by people without insurance. However, under microinsurance cover, assets depletion is minimized or eliminated entirely. More importantly, microinsurance that covers the healthcare cost of households prevents asset pawning and liquidation of essential household assets at 'give away' prices. In other words, insurance policies, especially medical insurance, reduce the tendency of disposing off important household assets to raise money for medical treatment and care. Although this result confirms the findings of Janzen and Carter (2013), Morsink *et al.* (2011), Mosley (2009) and Wagstaff and Pradhan (2005), it contradicts that of Cheung and Padieu (2011).

**Table 3.8: The Empirical Results**[28]

| Variables | Heckman | Treatment | IV |
|---|---|---|---|
| Microinsurance | 0.0712 | 0.1843 | 0.1899 |
| | (0.338) | (0.048) ** | (0.050)** |
| Microcredit | -0.0035 | -0.0019 | -0.0082 |
| | (0.951) | (0.972) | (0.887) |
| Inv.Mills ratio | -0.0589 | -0.0619 | |
| | (0.333) | (0.350) | |
| Not Married | -0.0938 | -0.0981 | -0.0935 |
| | (0.118) | (0.098)* | (0.119) |
| Education | 0.1772 | 0.1775 | 0.1772 |
| | (0.000)*** | (0.000)*** | (0.000)*** |
| T_HH_Size | -0.0605 | -0.0610 | -0.0614 |
| | (0.000)*** | (0.000)*** | (0.000)*** |
| HH Size≥15 | 0.0706 | 0.0731 | 0.0712 |
| | (0.005)*** | (0.003)*** | (0.004)*** |
| Resp.Age | -0.0076 | -0.0078 | -0.0072 |
| | (0.495) | (0.482) | (0.520) |
| Resp.Age Sq | 0.0001 | 0.0000 | 0.0001 |
| | (0.446) | (0.430) | (0.469) |
| Male | 0.0786 | 0.0743 | 0.0772 |
| | (0.166) | (0.188) | (0.175) |
| Income | 0.0666 | 0.0727 | 0.0732 |
| | (0.398) | (0.353) | (0.356) |
| Tradecredit | 0.1895 | 0.1911 | 0.1927 |
| | (0.009)*** | (0.007)*** | (0.008)*** |
| Rural | -0.7700 | -0.7721 | -0.7703 |
| | (0.000)*** | (0.000)*** | (0.000)*** |
| Non-Farming | 0.4313 | 0.4331 | 0.4318 |
| | (0.000)*** | (0.000)*** | (0.000)*** |
| *Constant* | 1.1240 | 1.009 | 1.3547 |
| | (0.003)*** | (0.004)*** | (0.002)*** |
| *Observations* | *667* | *667* | *667* |
| *Adj. R-Squ.* | *0.51* | *0.51* | |
| *P>F* | *0.000* | *P>Chi2=0.000* | *P>F=0.000* |

Note: ***, ** and * indicate 1%, 5% and 10% significance levels respectively.
Source: Author's computation based on the 2010 FINSCOPE data of Ghana

[28] In order to ensure consistency of results and heteroskedastic consistent estimates, robust standard errors have been performed on the variables. The results of the robust standard errors do not statistically differ from what is reported here. See Table A.1 in appendix A for the results of the robust standard errors.

## 3.6. CONCLUSIONS AND POLICY RECOMMENDATION

The study has assessed the strength of microinsurance services in reducing the risk of insured households to have to resort to asset loss to pay for risks that are not insured and to accumulate assets. Three empirical techniques, namely Heckman sample selection, treatment effects and instrumental variable models, were employed for the impact assessment. In line with theoretical and empirical postulations the results show that microinsurance schemes enable households to reduce asset loss and even increase their asset holdings.

In the event of substantial negative shocks such as fire, motor accidents, severe illness or even death, households without the necessary insurance cover liquidate essential assets in order to raise money for the mitigation of the risky event. Some of these assets, which are mostly liquidated below market prices, might have taken low-income households a considerable number of years to accumulate. Such a situation has the tendency to worsen the economic status of uninsured households. This underscores the need to integrate this financial package into private and public welfare interventions directed at low-income households. To the extent that microinsurance is inextricably linked to households' livelihood, integrating it into the various poverty interventions for low-income households will empower them to make steady asset build-up in order to escape poverty and sustain the welfare gains achieved. Indeed, microinsurance can equip households to break the interconnection between risks, vulnerability and asset loss, and turn the vicious-cycle of poverty into a virtuous cycle of well-being.

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# CHAPTER 4
# RISK COPING STRATEGIES AND CONSUMPTION SMOOTHING AMONG LOW-INCOME HOUSEHOLDS IN GHANA: DOES MICROINSURANCE MATTER?

## 4.1. INTRODUCTION

Low-income households employ a diversity of strategies to smooth consumption because the welfare consequences of consumption shocks are usually very high. These diverse risk coping mechanisms range from the disposal of productive assets, withdrawal of children from school, and child labour to a reduction in meals. However the empirical evidence from various developing countries suggests that these risk coping mechanisms are not good smoothers and do not improve the long term survival and well-being of households. Rather they almost always disrupt the growth path of low-income households, impoverish them and set them back into transient and chronic poverty. For instance, reducing meals may lead to malnourishment with pernicious health conditions, while withdrawing children from school and child labour may disrupt human capital development (Janzen & Carter, 2013a; Chakrabarty, 2012; Morsink *et al.,* 2011).

Microinsurance has been proposed as a better alternative for empowering low-income households to cope with risks effectively. It is a risk management tool that uses the concept of risk pooling to indemnify low-income persons against specific risks in exchange for affordable premiums which are mostly paid at irregular times and in uneven amounts. A substantive body of insurance literature has recognized microinsurance as a risk transfer instrument which does not only reduces the usage of detrimental coping strategies, but also empowers the poor to manage risks effectively and make a sustainable exit from poverty (e.g. see Janzen & Carter, 2013a; Morsink *et al.,* 2011; Dercon *et al*., 2008; Barnett *et al.,* 2008; Cohen *et al*., 2005; Churchill, 2002; Siegel *et al.,* 2001). The microinsurance pay-out received in the event that an insurable risk occurs, prevents asset pawning and emergency borrowing and, as noted by Giesbert (2010), equips low-income households to avoid using insufficient and costly alternative ways of coping with shocks.

The international development community (especially ILO, GIZ and USAID)[29] has also recognized microinsurance as a welfare enhancing tool. This has motivated some governments in sub-Saharan Africa to initiate financial reforms to encourage greater insurance inclusion for households living and working in the informal sector. Some of these reforms have led to the rolling out of

[29]ILO is International Labour Organization; GIZ is Deutsche Gesellschaft für Internationale Zusammenarbeit; USAID is United States Agency for International Development.

microinsurance to cover health risks and rural farmers in Kenya, Senegal, Malawi, South Africa, Uganda and Ghana.

Ghana in particular has witnessed the rolling out of both public and private microinsurance schemes for more than a decade. However there has been little or no empirical investigation into their impacts on consumption smoothing. Since the inception of formal[30] microinsurance schemes in 2003, the number of policies has grown quite impressively with about one million policies written as at 2011 (NIC & GIZ, 2012). Against this backdrop, it will be very interesting to ascertain whether microinsurance has reduced clients' dependence on costly coping strategies which undermine proper human capital development. Hence the current study undertakes an investigation into whether microinsurance facilitates consumption smoothing necessary for improved health and human capital growth. In particular we ask: can microinsurance empower low-income households to eliminate the reduction in meals as a coping strategy?

We use data from the 2010 FINSCOPE Survey which has very rich and in-depth information on 3 642 households' usage of financial services, risk management tools and shock coping strategies. The survey was conducted, among other things, to aid financial practitioners and analysts investigation into the impact of various financial products on households' welfare. This study is one of the first attempts to understand the effects of microinsurance on coping strategies from the perspective of Ghana.

The National Insurance Commission (NIC) has indicated its intention to upgrade its policy on microinsurance in order to make it more accessible and responsive to the needs of low-income households. The findings of this study will inform this policy upgrade by providing timely and invaluable grass root information about how microinsurance influences the choice of costly risk-coping strategies in Ghana.

The rest of this chapter is organized as follows: the literature review is captured in Section 4.1, Section 4.2 provides the patterns and trends of consumption poverty and an overview of microinsurance in Ghana, the methodology is in Section 4.3, the results are presented in Section 4.4 and the conclusion and policy recommendations are presented in Section 4.5.

## 4.2. LITERATURE REVIEW

### 4.2.1. Theoretical Literature

#### *4.2.1.1. The Life Cycle Theory*

This theory argues that the maximization of personal utility is achieved through the allocation and balancing of current and future earnings with a lifelong pattern of consumption (Modigliani &

[30] The *susu* type of microinsurance begun in the 1980s but folded up due to operational challenges.

Brumberg, 1954; Modigliani & Ando, 1957; Ando & Modigliani, 1963). It assumes that individuals' earnings and consumption expenditure follow a pattern of accumulation stage, consolidation stage, spending stage and gifting stage (Reilly & Norton, 1999). The implication is that the younger population saves less, because much of their current earnings are used to accumulate assets and pay off their car, college and housing loans. Hence the net worth of the younger population is smaller. The middle class on the hand consolidates and saves more because they may have paid off much of their loans and also may be earning more income. The older population is assumed to be in the spending and gifting stage and thus dissave. For individuals to achieve consumption smoothing, the theory suggests that savings at the different stages of life should be align with life cycle consumption patterns. Savings in this sense can be categorised into contractual and discretionary savings (Prinsloo, 2000). The contractual savings entails the subscription to insurance policies or retirement plans (pensions) for the management of risks and future consumption smoothing. Insurance as an aspect of savings may ensures that the consumption pattern of individuals at different stages of their lives is not disrupted by risk and inadequate current earnings.

#### *4.2.1.2. The Permanent Income Theory*

The permanent income hypothesis (PIH) was developed by Milton Friedman in 1957. It states that the average individual does not allow consumption to swing with income fluctuations in the short run. This is because an individual's consumption at a point in time does not necessarily depend on their current earnings, but mostly importantly on future income. Thus consumption smoothing is driven by changes in the lifetime income – permanent income – but not on the transitory or current income. This theory has practical implications for the insurance market. The payments made by individuals into a pool of an insurance policy entitle them to a future stream of income (claims) which can aid them to smooth out consumption even in times of income shocks.

### 4.2.2. The Empirical Literature

Households' consumption as noted by Morduch (1995) does not match income particularly well, hence a diversity of smoothing behaviours however inadequate has been developed by low-income households to deal with consumption shocks. These diverse strategies designed to maintain long-term survival and welfare can broadly be decomposed into two: risk management tools and risk coping strategies (Morduch, 1995; Alderman & Paxson, 1992). The risk management tools are *ex-ante* instruments adapted to manage income shocks and smooth out income. They are steps taken by the poor to protect their livelihood from negative income shocks before they occur (Morduch, 1995). Such strategies range from the combination of various economic activities including farm and non-farm activities in order to diversify income. Others are income skewing operations; that is, engaging in low risk production and employment at the expense of high returns

(Morduch, 1995; Alderman & Paxson, 1992; Rosenzweig & Binswanger, 1993; Dercon, 2002). The choice of these low-risk low-return economic activities can consign households to a lower level of well-being with adverse long run effects. Precautionary savings and investment in livestock as buffer against shocks have also been identified as risk management strategies among low-income households (Deaton, 1991; Rosenzweig and Wolpin, 1993).

Risk coping strategies are designed *ex-post* in response to the economic consequences of income shocks in order to achieve consumption smoothing. Examples of such strategies are assets disposal, informal insurance and reduction in daily meals. In Burkina Faso Fafchamps *et al.* (1998) report that income loss and consumption shocks due to drought are marginally dealt with through livestock sales. In contrast, Kazianga and Udry (2006) find no evidence concerning the usage of livestock as buffer stock to offset consumption shortfalls among households in rural Burkina Faso.

Informal insurance is also used by extended families, village committees and trade associations to cope with hardships (Lund & Fafchamps, 1997; Townsend, 1994). Informal financing from family and friends, *susu*[31] and ROSCAS[32] are also employed to cope with the consequences of financial shocks (Dercon, 2002; Bouman, 1995; Besley *et al.,* 1993; Rosenzweig, 1988). These social insurance networks are however only effective in dealing with idiosyncratic risks. The financial base of such networks is usually not sufficient for handling covariant risks.

Certain investments and expenditures which are critical for the proper development of human capital are sometimes sacrificed by the poor to cope with the adverse effects of repeated exposure to socio-economic downturns. Sometimes children are taken out of school to engage in child labour in order for the family to raise money to cope with financial distress (Chakrabarty, 2012), and this does not only impair a family's human capital growth, but can also have adverse trans-generational consequences on the capacity of a household to escape the traps of chronic poverty. Reduction in daily meals is another coping method that can have long-term deleterious impacts on the physical and intellectual development of household's members. Children are particularly very vulnerable since reduced nutrition can lead to irreversible impairment in health such as stunted growth, slower cognitive and motor development and high morbidity rates (Ray, 1998; Martorell, 1999).

Kochar (1995) indicated increased hours of working as critical for coping with hardships in rural India. Rahmato (1991) earlier reported a similar approach as well as wild fruit and firewood gathering as coping mechanisms adopted by the poor to cope with the severe famine that hit Ethiopia from 1984 to 1985. Recent evidence advanced by Berloffa and Modena (2013) suggest that Indonesian households use a similar mechanism to deal with crop loss in order to maintain a

[31] The regular contribution of smaller amounts of money towards a specified target.
[32] Rotating, savings and credit associations.

stable consumption path. Specifically, they report that while the non-poor smooth consumption through asset disposal and savings, the asset poor increase their labour supply to compensate for the decline in income and to overcome a drop in consumption.

Despite the diversity of strategies adopted by low-income households to cope with the financial consequences of risks, majority are still poor and very vulnerable to repeated episodes of socio-economic shocks. In the next few paragraphs we review the literature on how microinsurance can be a better alternative for influencing households' *ex-ante* decisions and for coping with *ex-post* risks.

Microinsurance plays a dual role in dealing with vulnerability and poverty traps: the indemnity cover and the pay-out in the occurrence of an insurable loss. Whereas the indemnity cover affects *ex-ante* decisions, the pay-out influences the choice of *ex-post* coping mechanism. First, the indemnity cover can have a positive influence on the *ex-ante* behavioural patterns of the poor by motivating them to invest in high yield high risk ventures. Such high yielding ventures can improve the economic growth path of the poor by aiding them to move steadily to a higher equilibrium and make a sustainable exit from poverty. It can also provide an "atmosphere of peace" and a "sense of hope" to the poor that they need not be anxious about future economic shocks. Secondly, the microinsurance pay-out that households receive if an insurable loss occurs has the potential to reduce the use of costly coping strategies such as the disposal of productive assets, taking children out of school, child labour and meal reduction. The evidence in the literature to some extent supports this two-pronged impact of microinsurance on households' welfare.

On households' *ex-ante* behavioural changes, Janzen *et al.* (2013) argue that the presence of microinsurance provides households with positive expectations about their future well-being and a positive probability of escaping the poverty trap. They further aver that households forgo precautionary investments in low yielding endowments as a coping strategy in order to take up microinsurance. This is expected to motivate low-income households to invest in higher yielding activities and propel them to a higher equilibrium of well-being. The findings of Janzen *et al.* (2013) corroborate an earlier work on the Malawian market by Nicola (2011) that weather insurance enhances the adoption of more productive farming technologies that improve farmers' welfare.

In India Mobarak and Rosenzweig (2012) report from a randomized study on the uptake and impact of rainfall index-based insurance that the risk appetite of households to invest in higher yielding seeds increases under formal insurance. A similar rainfall index-based insurance for farmers in northern Ghana was studied by Karlan *et al.* (2014). The findings indicate that insurance encourages increased investment into agriculture ventures and production choices which provide better returns to farmers.

Cai (2013) employed difference-in-difference and triple difference to evaluate the impact of agricultural insurance on farm production, credit financing and savings among households in rural China. The evidence from the study suggests that insurance (1) raises crop production by 20 percent and lowers farmers' tendency to diversify farm production; (2) reduces precautionary savings by about 30 percent and (3) increases the demand for credit by 25 percent. The crux effect of microinsurance on households' *ex-ante* behaviours is the empowerment of households to engage in productive activities that increase human and physical asset accumulation necessary for welfare enhancement.

The *ex-post* evidence is however inconclusive, ranging from positive impacts (Janzen & Carter, 2013a, 2013b; Morsink *et al.,* 2011; Hamid *et al.,* 2010) to negative impacts (Gnawali *et al.,* 2009) and mixed results or no impacts at all (Dercon *et al.,* 2012; Cheung & Padieu, 2011; Hsu *et al.,* 2011; Wagstaff *et al.,* 2009). The evidence on Kenya provided by Janzen and Carter (2013a and 2013b) indicates that microinsurance pay-out promotes asset retention, reduces the tendency to cut down on meals and equips households to escape poverty traps. Similarly Morsink *et al.* (2011) report from the Philippines that microinsurance has a declining effect on households' frequency of falling into the vulnerability – poverty vicious cycle and from Bangladesh, Hamid *et al.* (2010) also indicate that food sufficiency is greatly enhanced among insured households.

As indicated earlier, empirical information about the African experience concerning the impact of microinsurance on consumption smoothing has been very limited. Apart from the work of Janzen and Carter (2013a and 2013b) on the Kenyan drought-index microinsurance, evidence on whether the growing outreach of microinsurance has improved consumption smoothing among low-income households is virtually non-existent in Africa.

Besides the context-specific contribution indicated in the introduction, this study makes unique contribution to the empirical literature in two main ways: (1) Unlike the studies of Janzen and Carter which cover only northern Kenyan, this study covers rural and urban households across the whole of Ghana; (2) whereas the focus of most studies have been on rural farmers and weather-index microinsurance, this study extends the coverage to both farmers and non-farmers. The current study also extends the analysis to other microinsurance product such as life, property and health schemes.

## 4.3. OVERVIEW OF CONSUMPTION POVERTY AND MICROINSURANCE IN GHANA

This section presents the trend of consumption poverty across gender and geographical locations in Ghana. This overview provides the context within which the effect of microinsurance on consumption smoothing, which has direct consequences on consumption poverty, is evaluated. Consumption poverty is the standard of living at which the required calories intake falls below the

poverty line (GSS, 2007). It defines the nutritional requirements of each household member and the minimum amount of money necessary to provide the defined calories. The Ghana Statistical Service (GSS, 2014) has set the consumption poverty line at 2,900 kilocalories per equivalent adult, which translates into GHS1314.00 per equivalent adult per year in the January 2013 prices of Greater Accra Region. In international purchasing parity terms, this is US$1.83/day which is slightly higher than the World Bank's poverty benchmark of US$1.25 a day in 2008 prices.

Using this poverty benchmark, Ghana has reduced the incidence of consumption poverty by about half from a staggering percentage of 51.7 in 1991 to 28.5 percent in 2006 and to 24.2 percent in 2013 (GSS, 2008 & 2014). This indicates that Ghana may be able to achieve the first Millennium Development Goal (MDG) of reducing the poverty rate by half by the year 2015.

The gender dimension of consumption poverty indicates that male-headed households are on average much poorer than female-headed households (GSS, 2007 & 2014). This contradicts the perception that most women are much poorer than men. The rural-urban divide also shows that consumption poverty is disproportionately high in rural communities, with about 78 percent of households living below the poverty line residing in rural localities (GSS, 2014). Whereas about 2 percent of the poor population reside in urban coastal towns as high as 40 percent dwell in rural savannah (GSS, 2014). Though the regional distribution indicates a general decline of consumption poverty in all the regions, the rates of the three northern regions – Northern Region (50.4%), Upper East (44.4%) and Upper West (70.7%) – are above the national average.

Many programs have been initiated by the government and private entities not only to sustain the gains made in reducing consumption poverty, but also to accelerate the efforts of reducing all forms of poverty to the barest minimum. Examples of such programs are the Livelihood Empowerment against Poverty (LEAP), free meals for basic school children, capitation grants for basic schools, free maternal health care and microinsurance services.

The concept of microinsurance begun in Ghana in the 1980s through the traditional *susu* scheme. However it collapsed due to challenges with premium collections and other high transactional costs (NIC, 2008b). In the last decade the National Insurance Commission (NIC) has mounted a concerted campaign to overcome market and institutional barriers in order to achieve greater insurance inclusiveness for the lower end of the market. This led to the establishment of GLICO's[33] *Anidaso* scheme and SIC's[34] *Sika* Plan in 2003 and *Edwadifu Ahobanbo* by Downwell Insurance in 2005. Several other schemes have been established since 2005 (see Table 4.1).

[33] Gemini Life Insurance Company
[34] State Insurance Company

The NIC's campaign on microinsurance has increased the scale and outreach of microinsurance to more than 1 million lives, with about GHS11 703 488 (US$6 087 473) collected as premiums and GHS4 421 494 (US$2 299 803) paid as claims (NIC & GIZ, 2012; Buabeng & Gruijters, 2012). The product portfolio of the market is dominated by health, savings-linked and funeral/term life policies. Other products on the market are rainfall index, credit-linked and property policies. Commercial insurers sell these products in partnership with microfinance institutions, rural and community banks, post offices, telecoms, direct sales agents and nodal agencies such as trade associations and churches.

The efforts of the various stakeholders to increase access to microinsurance have been boosted by innovations from mobile phone technology, which is used to sell, collect premiums and effect claims payments. This has reduced the high overhead costs usually associated with the underwriting of several thousands of small policies. For example, Tigo and Airtel mobile telecommunications are in partnership with MicroEnsure and Star Microinsurance Services Ltd. respectively to extend microinsurance services to low-income households.

Although the microinsurance market has recorded increased market activity, its full potential remains largely untapped. The NIC has therefore initiated a new agenda to grow the microinsurance market and make it more proactive in addressing the needs of low-income households. Its proposed policy document on microinsurance states that "insurers cannot designate a product as microinsurance unless it considers that the product satisfied the following criteria: (1) target at low-income households; (2) affordable for low-income households and (3) accessible to low income households" (NIC, 2011:3). It also requires insurers to make microinsurance contracts very simple to understand with less legalese and no or few exceptions. It further requires claims to be dealt with expeditiously within 7 to 10 days (NIC, 2011).

**Table 4.1: Microinsurance Products**

| Insurer | Microinsurance Product | Class of Policy |
|---|---|---|
| GLICO | Anidaso Hospital Cash, Children's Education | Life, Family Life, Endowment, |
| Donewell Insurance | Edwadifus Ahobanbo | Life, Savings-linked |
| SIC Life | Sika Plan | Life, Savings-linked, Funeral |
| Star Life Assurance | Various | Life, Health, Funeral, Property |
| Vanguard Insurance | Shop Owner's Policy | Property, Goods in Transit |
| Ghana Agricultural Insurance Pool | Drought-Index | Crop insurance, Food Chain Policy |
| Credit Unions | Life Savings | Life |

Source: Adapted from Wiedmaier-Pfister and McCord, 2009.

## 4.4. METHODOLOGY

### 4.4.1. The Data

The study used the Ghana household survey undertaken in 2010 by Finmark Trust for the empirical analysis. In all 3 643 households from rural and urban settings in all ten regions of the country were randomly selected and interviewed. It has in-depth data on households' demographics, income, economic activities, education, asset ownership, financial knowledge, access to financial services and risk coping strategies. The dataset is divided into three categories based on access to financial services: (1) access to formal financial services such as commercial banks; (2) access to other formal financial services such as microfinance firms, insurance firms, savings and loans companies, rural and community banks; informal financial services such as savings clubs, *susu*, ROSCAS; and (3) no access at all. Since this study's focus is on low-income households we extracted the dataset of 800 households who use informal and *other* formal financial services for the empirical estimations. After cleaning the dataset of outliers, 682 datasets consisting of 438 insured and 244 uninsured households were used for the empirical analysis. The individual microinsurance products did not have enough observations to aid effective regression estimations, hence the 438 insured households is an aggregation of the following products: property, life, health, education, funeral, investment plan and livestock. The aggregation however has no negative influence on our analysis, because the focus of the study is not on individual microinsurance products, but rather on the comparison between insured and uninsured cohorts.

### 4.4.2. The Profile and Features of the Sampled Households

The result of a chi-square test on the degree of differences between the insured and the uninsured households is reported in Table 4.2. The literature on household economics indicates that the probability for a household to reduce meals may be influenced by the level of income. Indeed insufficient income can compel households to reduce the number of daily meals consumed. The chi-square test indicates that insured households do not significantly differ from the uninsured in terms of income levels. To this extent effective consumption smoothing among either the insured or the uninsured cannot be attributed to differences in their income levels. The test on the other variables of interest also shows that the two groups of households do not differ significantly from each other in terms of economic activities, proximity to financial services or rural-urban location, however they differ in terms of access to credit, remittances, education and family size. Whereas the insured has more access to the credit market, the uninsured receives more foreign remittances.

**Table 4.2: Chi-Square Test on the Profile of Insured and Uninsured Households**

| Variable | Uninsured HH (%)[C] | Insured HH (%)[C] | Chi-Square ($\chi^2_{.050}$) |
|---|---|---|---|
| Resp. Age[T] (mean years) | 38.02 | 39.81 | -1.7918 (0.0652)[T] |
| ***Resp. Gender*** | | | 0.1014 (0.750) |
| Male | 47.13 | 48.40 | |
| Female | 52.87 | 51.60 | |
| ***Resp. Marital Status*** | | | 2.2049 (0.138) |
| Married | 51.65 | 57.57 | |
| Others | 48.35 | 42.43 | |
| ***Resp. Education Level*** | | | 8.4240 (0.015)** |
| No formal Education | 13.17 | 7.78 | |
| Primary Education | 45.27 | 40.96 | |
| Secondary and above | 41.56 | 51.26 | |
| ***Household Income*** | | | 0.4930 (0.782) |
| 0 – GHS400 | 69.31 | 66.36 | |
| GHS401 – GHS1000 | 24.87 | 26.97 | |
| Above GHS1000 | 5.82 | 6.67 | |
| HH Size[T] (mean size) | 3.41 | 4.00 | -0.586 (0.003)***[T] |
| ***House Ownership*** | | | 0.2135 (0.899) |
| Rented | 32.79 | 34.47 | |
| Family Owned | 48.36 | 46.80 | |
| Occupied without payment | 18.85 | 18.72 | |
| ***Location*** | | | 0.0023 (0.962) |
| Urban | 68.44 | 68.26 | |
| Rural | 31.56 | 31.74 | |
| ***Economic Activity*** | | | 0.3053 (0.581) |
| Farming Enterprise | 29.92 | 31.96 | |
| Non-Farming Enterprises | 70.08 | 68.04 | |
| ***Proximity to Financial Inst*** | | | 0.1176 (0.732) |
| 10 – 30 minute walk | 69.23 | 67.62 | |
| Above 30 minute walk | 30.77 | 32.38 | |
| ***Access to Credit*** | | | 5.1651 (0.023)** |
| Never borrowed | 54.51 | 45.43 | |
| Have borrowed | 45.49 | 54.57 | |
| ***Remittances*** | | | 7.4542 (0.006)*** |
| Do not Receive Remittance | 52.92 | 63.68 | |
| Receives Remittances | 47.08 | 36.32 | |

Note: *** and ** indicate 1 and 5 percent significance levels respectively; [C] indicates that the addition for each variable is by columns; [T] indicates T-test instead of Chi-square.

Source: Author's computation based on the 2010 FINSCOPE Data of Ghana.

### 4.4.3. The Empirical Estimations

The microinsurance products under study were not randomized. Households have free will to either buy or reject these products. The option to choose creates room for self-selection and endogeneity bias. Since selection bias and endogeneity problems can cloud effective impact assessment, we resolved this by employing three models for the empirical analysis: Heckman

sample selection, treatment effects model and instrumental variable modelling. Each of these models has a unique advantage in correcting selection and endogeneity bias.

#### *4.4.3.1. Heckman Sample Selection Model*

Heckman's model corrects selection bias associated with participation in non-randomized programs. It is a two-step estimation comprising a probit model and an outcome regression (Heckman, 1974, 1978 and 1979). The probit model is used to estimate the demand for microinsurance in the following set up:

$$insure_i = \begin{cases} 1 \; if \; household \; i \; has \; microinsurance \\ 0 \; if \; household \; i \; never \; had \; microinsurance \end{cases} \quad 4.1$$

The above set up is given as:

$$insure_i = z_i\delta + \mu_i \quad 4.2$$

Thus $Prob(insure_i = 1|z_i) = \Phi(z_i\delta)$ and $Prob(insure_i = 0|z_i) = 1 - \Phi(z_i\delta)$

Where $z_i$ is a vector of exogenous factors influencing the demand for microinsurance and $\Phi(\cdot)$ is the standard normal cumulative distribution function. The inverse Mills ratio or the hazard lambda which controls for selection bias is then calculated from the estimated co-efficients of the probit model and used as an additional explanatory variable in the outcome regression (Janzen and Carter, 2013b; Lin, 2007). The inverse Mills ratio is given as:

$$\lambda_i = \frac{\phi(z_i\hat{\delta})}{\Phi(z_i\hat{\delta})} \quad 4.3$$

Where $\lambda_i$ is the inverse Mills ratio, $\phi$ is the standard normal density function, and $\Phi$ is as defined in the probit model above. The second step equation – that is, the impact of microinsurance on food reduction – is then estimated with the inverse Mills ratio[35] as an explanatory variable.

$$FOR_i = \beta_0 + \beta_1 insure_i + \beta_2\lambda_i + control_i + \varepsilon_i \quad 4.4$$

Where $FOR_i$ is food reduction as a coping strategy by household $i$; $insure_i$ is microinsurance; $control_i$ is a vector of control variables such as education, age, marital status, income and economic activity, rural-urban setting and regional effects; and the error terms $(\mu_i; \varepsilon_i)$ of both equations (2) and (4) are bivariate normal with mean zero.

[35] The ivtreatreg STATA program designed by Cerulli (2012) estimates the inverse Mills ratio (Heckman correction terms) automatically from the probit model.

#### *4.4.3.2. The Treatment Effect Model*

Whereas the Heckman model uses the observed variables of only the participants, the treatment effect model uses the observed variables of both the program participants and the non-participants for the estimation. It is a two-stage technique involving the selection and outcome model which can be estimated simultaneously.

First stage: selection model:

$$insure_i = 1 \; if \; insure_i^* > 0, and \; insure_i = 0 \; otherwise$$

Thus $insure_i^* = z_i\delta + \mu_i,$ 4.5

$$FOR_i = x_i\beta + insure_i\gamma + control_i + \varepsilon_i \quad 4.6$$

The errors terms ($\mu_i$ and $\varepsilon_i$) are bivariate normal with zero mean. To obtain the outcome models for both program participants and non-participants, equation (4.5) is put into equation (4.6). That is:

When $insure_i^* > 0, insure_i = 1: FOR_i = x_i\beta + (z_i\delta + \mu_i)\gamma + \varepsilon_i$ 4.7

And when $insure_i^* \leq 0, insure_i = 0: FOR_i = x_i\beta + \varepsilon_i$ 4.8

Where the $FOR_i = x_i\beta + (z_i\delta + \mu_i)\gamma + \varepsilon_i$ is the participants outcome model while the non-participants outcome model is $FOR_i = x_i\beta + \varepsilon_i$. These are evaluated simultaneously.

#### *4.4.3.3. Instrumental Variable Model (IV Model)*

The demand for microinsurance is not only influenced by observed factors, but also by unobserved factors such as risk appetite, entrepreneurial passion, motivation or even fear. Such unobserved variables are however not likely to be captured by either the Heckman or the treatment effect models. We have therefore estimated an instrumental variable model to take account of the unobserved variables and also to control for endogeneity bias. The instrumental variable approach requires an observed variable that is (1) highly correlated with the demand for microinsurance, but (2) uncorrelated with the unobserved factors influencing households to use *food reduction* to cope with shocks. The assumptions of the IV model referred to as "exclusion restriction" by Khandker *et al.* (2010:88) are summarised as:

$$correlated \; with \; insure: cov\,(Z, insure) \neq 0$$

$$uncorrelated \; with \; error \; term \; (\varepsilon): cov\,(Z, \varepsilon) = 0$$

Where *Z* is the chosen instrument. We chose two nationally recognised identity cards as the possible instruments: the National Health Insurance Scheme's identity card (NHIS ID) and the Electoral Commission's identity card (the voter's ID). Although the NHIS ID is issued by the National Insurance Authority to clients of the government health insurance scheme, private

insurance companies have come to accept this card as a form of identification. The voter's ID is also issued by the Ghana Electoral Commission for the purpose of voting in national and local elections. Financial institutions including insurance companies have however adopted this card as a major identification of their clients. These two ID cards are major forms of identification that every individual intending to purchase microinsurance is expected to hold. So they are key determinants of the uptake of microinsurance. Any one of them is accepted as a prerequisite for the purchase of microinsurance. Whereas these cards influence one's decision to purchase microinsurance, they do not influence the decision to skip or cut the number of meals per day.

Wooldridge (2010) and Cerulli (2012) explain that the most efficient instrument is the predicted probability of getting treatment; comprising the selected instruments (in this case the ID cards) plus the other exogenous (control) variables influencing the outcome variable. That is the predicted probability of microinsurance,$[P(\widehat{insure}_i|x_i z_i)]$, derived by regressing $insure_i$ on $x_i$ and $z_i$ is used as the instrument because its generates efficient and consistent estimates and in the words of Cerulli (2012) "is the best instrument because it generates the smallest projection error". We have followed this estimation strategy under the IV approach by using an identification strategy which involves an imposition of an exclusion restriction, the instruments, which predict only the selection process, but not the outcome. This implies that selection into the program relies on the same factors that affect the outcome plus the instruments $z_i$ which do not affect directly the outcome, but indirectly through their effect on $insure_i$ (Cerulli, 2012; Awel & Azomahou, 2014).

Under the IV approach different estimation models have been designed to evaluate programs such as microinsurance. Examples of such models are the IV-probit, direct-2SLS and probit-2SLS. Although the IV-probit is good for estimating a model with binary dependent and an endogenous variable – just as in this case where the dependent variable, $FOR_i$, is binary and $insure_i$ is endogenous – it assumes that the endogenous variable is continuous and thus not appropriate for estimating a model with discrete endogenous variable[36]. It is therefore not suitable for the present study because our endogenous variable, $insure_i$, is discrete. The direct-2SLS is also not appropriate because it is designed for the estimation of linear regression.

The probit-2SLS fits properly a model where the endogenous variable is binary. First, we estimated a probit model of $insure_i$ on $x_i$ and $z_i$ to derive the predicted probability of $insure_i$. Second, we used the predicted probabilities as instruments of $insure_i$ to estimate the two-stage least squares (2SLS) model. This approach is known to yield consistent estimates and is also more efficient than the direct-2SLS (Cerulli, 2012).

[36] See Newey (1987) for the underlying theory of instrumental variables with probit modelling.

The probit-2SLS also allows for the determination of homogenous and heterogeneous treatments outcomes. It is thus very appropriate for this study. Following Cerulli (2012) and Awel and Azomahou (2014), we operationalised the probit-2SLS in three stages:

1. Run a probit of $insure_i$ on $x_i$ and $z_i$ to obtain $P_{insure}$, that is the predicted probability of $insure_i$. That is: $insure_i = \gamma Z_i + \phi X_i + \mu_i$
2. Estimate an OLS of $insure_i$ on $x_i$ and $P_{insure}$ to obtain the fitted values of $insure_{2fv,i}$.
3. Estimate a second OLS of the outcome variable $FOR_i$ on $x_i$ and $insure_{2fv,i}$.

The parameter of $insure_{2fv,i}$ is the best estimate of the average treatment effect. Also this approach does not demand for consistency that the selection model be properly specified (Wooldridge, 2010; Cerulli, 2012).

## 4.5. RESULTS AND DISCUSSION

The results of all the three models in Table 4.3 show a significant inverse impact of microinsurance on the reduction in the number of daily food intake. In particular, the Heckman model shows that households accessing microinsurance services are less likely to reduce daily meals just to cope with risks. The treatment effects model shows a similar result. The effect of microinsurance on household consumption is even larger if unobserved factors are accounted for through the instrumental variable technique. The instrumental variable approach indicates that insured households are 22 percent less likely to forgo daily food just to cope with socio-economic shocks. This finding corroborates the Kenyan evidence adduced by Janzen and Carter (2013a and 2013b).

The summary of the three estimations is that microinsurance improves consumption smoothing and food security among insured households by eliminating under-nutrition and malnourishing actions such as reduction in food intake. By providing households with better strategies to deal with risk, microinsurance does not only leads to adoption of more efficient *ex-ante* behaviours, it also plays a crucial role in improving households' health outcomes through better smoothing of consumption.

In the event of shocks low-income households are mostly compelled to sell essential asset and or cut meals to raise money to cope (Janzen & Carter, 2013b). In most cases household food consumption is the first victim to be compromised in the form of reduced meals in order to cope with shocks. However, the consequential effects of forgoing meals can be very damaging to the health of a household especially children. Thus using microinsurance to eliminate or reduce the usage of meals as a coping mechanism can have long-term positive implication on households' welfare.

By facilitating proper consumption smoothing, microinsurance reduces consumption poverty. This implies that the inadequacy of current earnings would not force households into consumption poverty if such households are insured. This is in line with the life cycle theory that consumption can be smoothen over time and over states of nature if insurance is used as a vehicle to accumulate financial savings during periods of earnings to cover the possibilities of future shocks in earnings. It also confirms the permanent income hypothesis and the empirical findings of Hamid *et al.* (2010) and Janzen and Carter (2013a, 2013b).

The policy implications of the current findings are quite enormous. For instance the Government of Ghana is running a poverty reduction program – the Livelihood Empowerment against Poverty (LEAP) – through which extremely poor households are given monthly cash transfers. The program which forms part of the National Social Protection Strategy has recognised the welfare value that microinsurance can add to the LEAP cash transfer. Thus free health insurance has been added to the social cash transfer in order to properly empower the beneficiaries to use the cash transfer for the necessary household consumption expenditures. Although the inclusion of the health insurance is good, the gains may be substantial if other microinsurance products such as life, crop and fire are integrated into the program. This can be done through a public private partnership agreement where private insurers will provide these products at subsidized premiums paid by the government.

**Table 4.3: The Impact of Microinsurance on Consumption Smoothing**

| Variables | Heckman | Treatment | IV |
|---|---|---|---|
| ***Financial Variables*** | | | |
| Microinsurance | -0.2072 | -0.1927 | -0.2231 |
| | (0.006)*** | (0.007)*** | (0.007)*** |
| Microcredit | -0.0541 | -0.0499 | -0.0501 |
| | (0.241) | (0.262) | (0.293) |
| Savings | -0.0668 | -0.0579 | -0.0623 |
| | (0.214) | (0.264) | (0.251) |
| Susu_Box (Piggy_Bank) | -0.0860 | -0.0862 | -0.0767 |
| | (0.014)** | (0.010)** | (0.035)** |
| Hide_Money_(underground) | 0.0305 | 0.0259 | 0.0332 |
| | (0.221) | (0.282) | (0.212) |
| Gone Without Cash | -0.0074 | -0.0081 | -0.0072 |
| *(5=Never)* | (0.039)** | (0.020)** | (0.010)** |
| Financial Assistance | -0.0029 | -0.0030 | -0.0030 |
| | (0.058)* | (0.044)** | (0.017)** |
| Income Source | -0.0012 | -0.0015 | -0.0009 |
| (*3=Salaries)* | (0.864) | (0.828) | (0.903) |
| Barter Trade | -0.0257 | -0.0265 | -0.0371 |
| | (0.248) | (0.207) | (0.099)* |
| Assistance_Food (Goods) | -0.0025 | -0.0063 | 0.0027 |
| | (0.940) | (0.843) | (0.925) |
| Trade Credit | -0.0026 | -0.0150 | -0.0144 |
| | (0.960) | (0.764) | (0.771) |
| Hire Purchase | -0.0974 | -0.0881 | -0.0817 |
| | (0.163) | (0.191) | (0.240) |
| Receive_Remittance | 0.0163 | 0.0191 | 0.0180 |
| (*1=yes*) | (0.726) | (0.672) | (0.707) |
| ***Household Characteristics*** | | | |
| Resp. Education | 0.0109 | 0.0106 | 0.0096 |
| | (0.370) | (0.366) | (0.422) |
| Resp. Age | -0.0081 | 0.0050 | -0.0363 |
| | (0.547) | (0.516) | (0.166) |
| Resp. Age Square | 0.0001 | -0.0001 | -0.0004 |
| | (0.436) | (0.353) | (0.158) |
| Female | -0.1180 | -0.1218 | -0.1246 |
| | (0.011)** | (0.007)*** | (0.009)*** |
| HH_Size | 0.0227 | 0.0214 | 0.0287 |
| | (0.123) | (0.127) | (0.068) |
| HH_Head | 0.0299 | 0.0295 | 0.0080 |
| | (0.578) | (0.561) | (0.889) |
| Marital | 0.0151 | 0.0221 | 0.0218 |
| | (0.597) | (0.207) | (0.590) |
| Bread Winner | -0.0487 | -0.0397 | -0.0404 |
| (1=Yes) | (0.127) | (0.190) | (0.147) |
| Financing_HH_Education | 0.0373 | 0.0385 | 0.0331 |
| | (0.108) | (0.0.84)* | (0.198) |
| Economic Activity | 0.1307 | 0.0953 | 0.1416 |
| | (0.138) | (0.068)* | (0.248) |
| Illness | -0.0252 | -0.0265 | 0.0090 |
| | (0.472) | (0.172) | (0.866) |
| Threat to Income | 0.0048 | -0.0008 | 0.0060 |
| | (0.274) | (0.740) | (0.320) |
| Rural Areas | -0.0762 | -0.0508 | -0.1524 |
| | (0.366) | (0.321) | (0.170) |
| ***Household Assets*** | | | |
| Access to Water | -0.0097 | -0.0104 | -0.0094 |
| | (0.058)* | (0.035)** | (0.064)* |
| Access to Electricity | -0.0074 | 0.0486 | 0.0682 |
| | (0.039)** | (0.473) | (0.336) |
| Access to Cooking Stove (Electric) | 0.0931 | 0.0943 | 0.0661 |
| (1=yes) | (0.345) | (0.320) | (0.540) |
| Access to Cooking Stove (Gas) | 0.0645 | 0.0556 | 0.0714 |
| (1=yes) | (0.222) | (0.277) | (0.198) |
| Access to Microwave | 0.0321 | 0.0316 | 0.0382 |
| (1=yes) | (0.658) | (0.654) | (0.615) |
| ***Inverse Mills Ratio*** | | | |
| _WL1 | 0.0179 | | |
| | (0.832) | | |
| _WL0 | -0.1047 | | |
| | (0.111) | | |
| Hazard Lamda | 0.0601 | | |
| | (0.238) | | |
| Constant | 0.7706 | 0.7117 | 1.2623 |
| | (0.164) | (0.121) | (0.069)* |
| *R – Square* | *0.13* | *Wald=119.49* | *R-Square = 0.10* |
| *Prob>F* | *0.001* | *Prob>Chi2=0.000* | *Prob>F=0.000* |

Note: ***, ** and * indicate 1%, 5% and 10% significance levels respectively. P-values are in parenthesis

## 4.6. CONCLUSION AND POLICY RECOMMENDATIONS

In the event of socio-economic shocks low-income households adopt a variety of strategies, including reducing the number of daily meals consumed, in order to cope. Sacrificing the quality and quantity of daily meals can have pernicious and irreversible consequences on the health and development of a household. Indeed underfeeding can lead to malnourished children and subsequent damage to their motor functions and cognitive skills. In this study we have delved into the capacity of microinsurance to equip low-income households to smooth out consumption by avoiding meal reduction as a risk coping strategy. In particular we have examined the effect of microinsurance as an alternative to costly coping mechanisms such as meals reduction which undermine the health and welfare of households. The empirical investigations indicate that insured households are less likely to forgo daily meals.

The policy implications of these findings are enormous. The value of microinsurance is not just the transfer of risk, but most essentially the empowerment of low-income households to adopt effective consumption smoothing actions which are critical for healthy living and human capital growth. This has implications for financial sector policies in developing countries. In particular policies that promote microinsurance and access to microinsurance will have a tremendous impact on the government policy of reducing poverty through human development.

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# CHAPTER 5
# EXPLORING THE EFFECT OF MICROINSURANCE ON ASSET INEQUALITY AMONG HOUSEHOLDS IN GHANA[37]

## 5.1. INTRODUCTION

Unexpected events such as accidents and death can force certain households to dispose of essential assets to cope. By insuring households against future welfare losses, microinsurance helps in the reduction of asset loss, vulnerability and poverty. The indemnity enjoyed by the insured prevents the liquidation of essential assets at below market prices. This facilitates household financial stability and the steady build-up of essential assets by families. The long-term benefits of the avoidance of asset loss and financial stability are sustained poverty reduction and reduction in asset inequality among low-income households. Asset loss, poverty and inequality go hand in hand, but microinsurance can break a part of the cycle that ties them together.

However the issue of whether microinsurance can reduce asset inequality is relatively new to the literature and evidence on it from the perspective of Africa is non-existent. Hence this study delves into the trends of asset inequality among households in Ghana and determines whether microinsurance schemes provided by the private sector and the government help to reduce asset inequality. In particular we ask: can microinsurance be used to bridge the asset inequality gap among households in Ghana?

The level of the global household wealth was estimated at US$222.7 trillion in 2012: if shared equally, this translates into US$48 500 per adult of the 4.6 billion global adult population (Credit Suisse, 2012). The distribution of this wealth, however, reveals incredible levels of inequalities within and between countries. For instance, Switzerland has household wealth per adult of US$470 000; Australia has US$350 000; Norway has US$330 000 while India, Ghana and Burundi have US$4 250; US$2 009 and US$283 respectively (Credit Suisse, 2012). The continental dynamics indicate that Africa is second to Latin America as the most inequitable region of the globe. Indeed, six of the ten countries with the highest levels of inequalities are in Africa (AfDB, 2012a).

In Ghana the Food and Agricultural Organization (FAO, 2012) reports of (1) severe economic inequalities and poverty in the three northern regions of the country, and (2) persistent employment inequalities among male and female and across the rural-urban divide. These economic and

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employment inequalities impede the efforts of individuals and households in accumulating private assets. Van de Poel *et al.* (2008) provide evidence from a socio-economic inequality study involving 47 developing countries that a "queuing effect" exists in Ghana's socio-economic inequality since the upper class are better off while the bottom class is expected to wait for a "trickle-down" effect. Similarly, the most recent living standard survey (GLSS 5) conducted by the Ghana Statistical Service indicates wide inequalities in per capita consumption expenditure. The highest quintile has an average per capita expenditure of about GHS1 261 (US$1 261)[38]. This is nine and half times higher than the per capita expenditure of households in the lowest quintile (GHS132.00 or US$132.00) and about two times more than the national average of GHS644.00 (US$644.00).

The findings of this study will not only guide the government on how to reduce these inequalities, but it will also fulfil the urgent need in the literature about the effect of microinsurance on asset inequality. It will also influence the National Insurance Commission's (NIC) policy on the microinsurance industry.

Another unique feature of this study is its focus on asset inequality instead of income inequality as a welfare measure. There is a debate (e.g. see Harttgen *et al.,* 2013) about whether assets are a better measure of welfare than income and consumption expenditures. Several studies (see e.g. Moser & Felton, 2007; McKenzie, 2004) claim that household assets are practically more accurate and consistent in measuring poverty because assets do not suffer from the issues of recall bias, mis-measurement, and households' reluctance to divulge sensitive information regarding income and consumption expenditures.

However, Harttgen *et al.* (2013) argued that assets are not good proxies for trends in income or consumption and hence cannot be used to gauge poverty levels or economic improvement. We add a new dimension to this debate by focusing on asset inequality instead of asset poverty or income poverty. Also most studies do not analyse how government policy interventions have influenced the observed levels of inequalities. In this study we employed the Gini coefficient to estimate asset inequality and then proceed to determine whether both the government and private microinsurance schemes have had a reducing effect on levels of asset inequalities among low-income households.

The rest of this chapter is organized as follows: Section 5.1 provides a brief review of the relevant literature; an overview of poverty and inequalities situation in Ghana is captured in section 5.2; an overview of the microinsurance sector is presented in section 5.3; the methodology is outlined in

[38] Based on the 2007 exchange rate between Ghana and the United States of America.

section 5.4; the results are presented in section 5.5 and the conclusion are presented in section 5.6.

## 5.2. LITERATURE REVIEW

Ray (1998) explains inequality as a fundamental disparity which allows a person access to certain opportunities and material choice, but deny another person those very same opportunities. Asset inequality is a disparity in wealth and living standards across groups of people. It is the accumulation of more private assets and or access to more public assets by certain households while the capacity of others to own such assets is limited by socio-economic circumstances. An uninsurable risk is one major situation that can weaken the capacity of individuals to build a stock of assets, necessary for closing the asset inequality gap. In the absence of insurance, risk as pointed out by Smith (1997:5) “may limit the ability of households to hold onto their previously accumulated wealth”.

An insurance cover facilitates asset retention and may equip individuals and economic entities to overcome asset disparities in a gradual manner. The following conceptual framework sheds light on how insurance can influence asset inequality among households. As illustrated in Figure 5.1, both insured and uninsured households are assumed to have begun from the same level towards the desired equality benchmark. After years of acquiring assets through either savings or bank credit, both households are assumed to have suffered from a risky event such as fire. With the aid of the insurance cover, the insured is restored to his original position just as it was before the fire. The assets of the uninsured are however lost to the fire, due to lack of insurance cover, and his position is possibly made worse since he may have to sell some more assets to resettle and return to normalcy. This tends to widen the asset build-up gap between the insured and uninsured and their inequality levels in relation to the equality benchmark. The end effect is that the insurance policy helps the insured to prevent asset loss and hence reduce the asset inequality gap in relation to the equality benchmark while the inequality gap of the uninsured almost always widens.

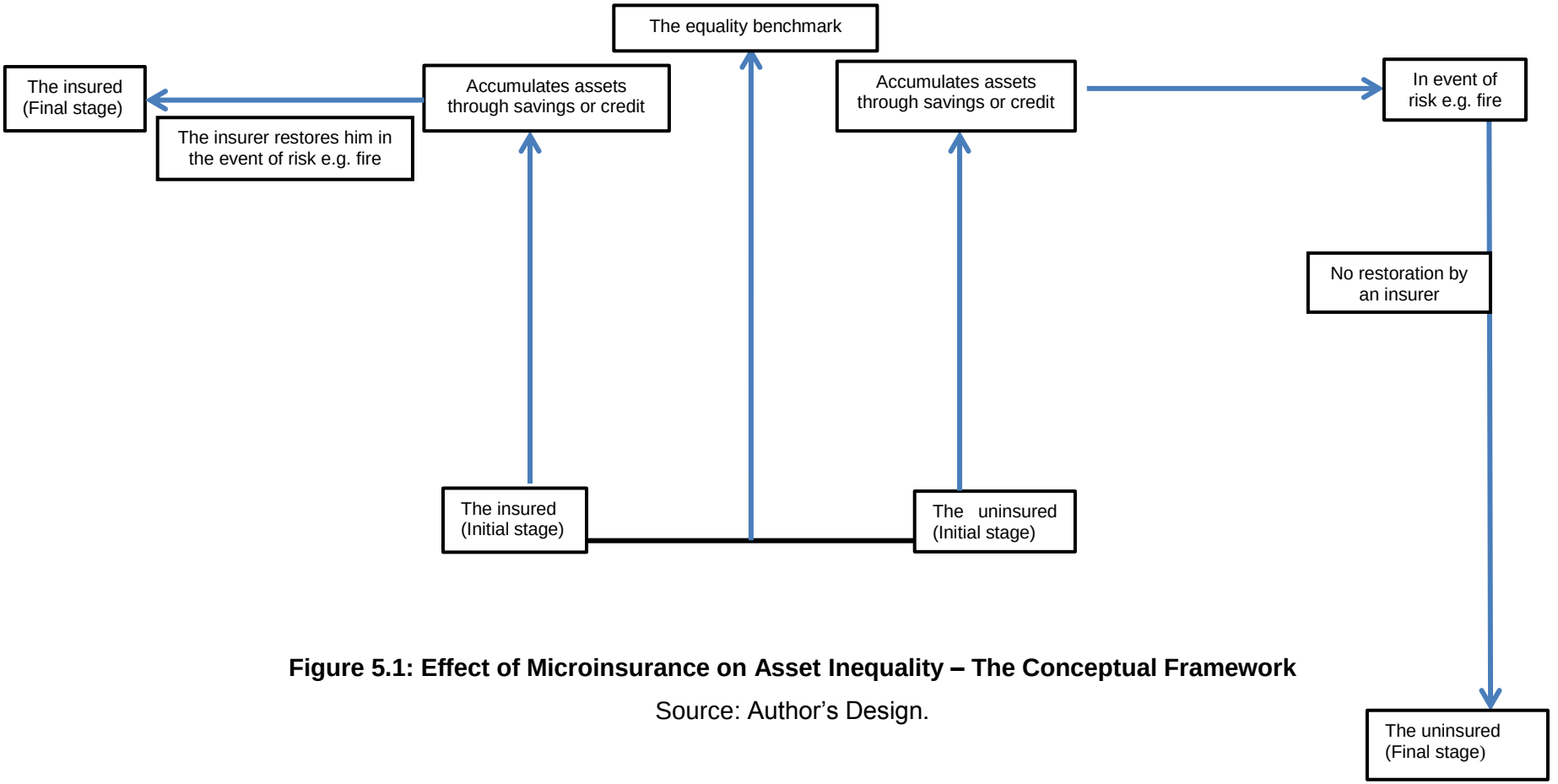


**Figure 5.1: Effect of Microinsurance on Asset Inequality – The Conceptual Framework**

Source: Author's Design.

This phenomenon regarding the effect of microinsurance on asset inequality is relatively new to the literature, hence empirical evidence on it is non-existent. The available literature, which is mainly focused on health insurance, is also diverse and inconclusive. A priori insurance may influence the levels of socio-economic inequalities among groups and across space. In particular employment fringe benefits related to health and accident insurance, which are most likely to favour skilled employees (the majority of whom are already in the high income bracket), may widen or sustain the inequality gap among groups of people (Burkhauser & Simon, 2010). However, insurance can close the inequality gap if tax laws require employers to pay equal insurance fringe benefits to employees regardless of the differences in their basic salaries (Burkhauser & Simon, 2010). Thus, insurance can have a double-edged sword effect on economic inequalities among groups of people.

Studies on the welfare impact of insurance programs have yielded mixed results. For instance, Wu *et al.* (2004) investigated the impacts of welfare insurance programs on rural and urban inequalities in the United States of America. The authors employed the Atkinson welfare index, the Gini index, the coefficient of income variation and the relative mean deviation of income as well as panel regression techniques for their analysis. Their findings indicate among others that whereas disability insurance has a statistically significant reducing impact on both pre-tax and post-tax income inequality, unemployment insurance and supplementary social insurance do not reduce income inequality in both the pre-tax and post-tax regimes. This mixed result may be a pointer that even within the same national borders different insurance interventions depending upon their designs and the status of the recipients could have declining or no effect at all on income inequalities.

Another set of mixed results was provided by Levy (2006) in a study of how wage disparities respond to health insurance in the USA. The finding indicates a declining effect of health insurance on the gender-wage differential, but a negligible impact on the race-wage disparity.

The European evidence is as diverse and inconclusive as the American experience. For instance, in a household study of five European countries Jones *et al.* (2004) show that private health insurance leads to inequity in the use of specialist medical personnel. However Van Doorslaer *et al.* (2002) produce opposing findings by showing that the rate of “pro-rich” inequity declines if private insurance usage is controlled for. The findings of Van Doorslaer *et al.* (2002) and Jones *et al.* (2004) are at variance as far as the effect of private health insurance on health inequality is concerned.

Other studies have shown that insurance can reduce socio-economic inequalities. Burkhauser and Simon (2010) report that employer health insurance reduces income inequality among American

households. They further show that the government social health insurance schemes – Medicaid and Medicare – also decrease inequalities very substantially.

The study by Burkhauser and Simon (2010) lends support to an earlier work on the Canadian welfare insurance done by Erksoy *et al.* (1995) and Countryman (1999). Erksoy *et al.* (1995) observe that tight restriction on access to unemployment insurance leads to an increase in income equality. Countryman (1999) combined the Gini coefficient, the mean logarithmic deviation and the Atkinson measure to investigate the effect of unemployment insurance on income inequality among households across the provinces of Canada. He reports that unemployment insurance reduces income inequality among households across all the provinces, an indication that unemployment insurance is an equality enhancing scheme, especially for low-income households. His findings also point to significant distributional benefits from unemployment insurance.

At the aggregate level, asset and income inequalities have been found to be a catalyst for socio-political unrest, macroeconomic instability and the stagnation of economic growth (see e.g. Benabou, 1996; Alesina & Rodrik, 1994; Persson & Tabellini, 1994). Birdsall and Londono (1997) investigated the effects of asset inequalities on poverty alleviation and economic growth of Latin America countries. In summary their findings show: (1) incomes of the very poor are highly sensitive to economic growth; (2) asset accumulation is the major determinant of growth in the income of the poor; (3) land and human capital inequalities have more severe adverse effects on the poor than on the rest of the population; (4) the initial threshold of asset and human capital inequalities impact subsequent economic growth negatively; and (5) income inequality has an inverse relationship with economic growth and this relationship mirrors the dynamics of asset accumulation and ownership in various Latin America countries.

## 5.3. OVERVIEW OF POVERTY AND INEQUALITY TRENDS IN GHANA

Ghana is one of the fastest growing economies on the Africa continent and has since 2003 been growing faster than the average growth rate of both West Africa and the entire continent (AfDB, 2012b). This has resulted in the reduction of poverty from 51.7 percent in 1991 to 24.2 percent in 2013 (GSS, 2014). Indeed, her poverty reduction rates have been acclaimed as one of the best in the West Africa sub-region (IFAD, 2012). In spite of this progress, poverty is still widespread in Ghana, although not evenly dispersed. Recent estimates indicate that about 37.9 percent of rural and 10.6 percent of urban population live below the poverty line (UNDP, 2011; GSS, 2014). Closely associated with the level of poverty are income, wealth, health and asset inequalities between genders and across geographical areas.

The report of the 5$^{th}$ Ghana living standard survey (GLSS V) indicates improved health outcomes among Ghanaians. This has translated into the country recording one of the highest life

expectancies in sub-Saharan Africa. The life expectancy of Ghana has witnessed a consistent increase from 46 years in 1960 to 64 years in 2011, as against the average of 56 years for sub-Saharan Africa (World Bank, 2011). Health expenditure per capita at purchasing power parity has also doubled from US$42 in 1995 to US$90 in 2011 (World Bank, 2011). Nevertheless, there are wide disparities in health outcomes. For instance, in Accra – the capital city – the percentage of children below the age of 1 year who had not been vaccinated was zero while in the rural forest and rural savannah the non-vaccination rates were 6.4 percent and 10.8 percent respectively (GSS, 2008).

The gap between rural-urban health indicators is even more disturbing in the distribution of sanitation and water facilities, as shown in Table 5.1. The rural areas have much less access to quality sanitation and water facilities and are thus prone to cholera and water-borne diseases. Since 1990 the average sanitation facilities in the urban dwellings has consistently been two and three times more than the national and rural average access respectively. Despite the wide inequalities, the water sub-sector has received much investment, leading to 122 percentage improvement in the rural areas in the last two decades.

**Table 5.1: Access to Sanitation and Water Facilities from 1990-2010, Ghana**

| Years | Improved Sanitation Facilities | | | Improved Water Facilities | | |
|---|---|---|---|---|---|---|
| | Rural[a] | Urban[b] | Total[c] | Rural[a] | Urban[b] | Total[c] |
| 1990 | 4 | 12 | 7 | 36 | 84 | 53 |
| 1991 | 4 | 12 | 7 | 38 | 84 | 55 |
| 1992 | 4 | 13 | 7 | 40 | 84 | 57 |
| 1993 | 4 | 13 | 7 | 43 | 85 | 59 |
| 1994 | 5 | 13 | 8 | 45 | 85 | 61 |
| 1995 | 5 | 14 | 9 | 47 | 85 | 62 |
| 1996 | 5 | 14 | 9 | 49 | 86 | 64 |
| 1997 | 5 | 14 | 9 | 51 | 86 | 66 |
| 1998 | 5 | 15 | 9 | 53 | 87 | 67 |
| 1999 | 6 | 15 | 10 | 56 | 87 | 71 |
| 2000 | 6 | 16 | 10 | 58 | 87 | 71 |
| 2001 | 6 | 16 | 10 | 60 | 88 | 73 |
| 2002 | 6 | 16 | 11 | 62 | 88 | 74 |
| 2003 | 7 | 17 | 12 | 64 | 88 | 75 |
| 2004 | 7 | 17 | 12 | 66 | 89 | 77 |
| 2005 | 7 | 17 | 12 | 69 | 89 | 79 |
| 2006 | 7 | 18 | 12 | 71 | 89 | 80 |
| 2007 | 7 | 18 | 12 | 73 | 90 | 81 |
| 2008 | 8 | 19 | 13 | 75 | 90 | 82 |
| 2009 | 8 | 19 | 14 | 77 | 91 | 84 |
| 2010 | 8 | 19 | 14 | 80 | 91 | 86 |

Notes: [a] = % of rural population with access; [b] = % of urban population with access and [c] = % of the total population with access.

Source: Author's construction based on the data of World Development Indicators, 2011.

It is also estimated that on average, the annual per capita consumption expenditure in Ghana is GHS644 (US$644), implying an overall average expenditure of about GHS2.00 (US$2.00) per person per day. In terms of the quintile groups, the highest quintile has an average per capita expenditure of about GHS1261 (US$1261). This is nine and half times higher than the per capita expenditure of households in the lowest quintile (GHS132.00 or US$132.00) and about two times more than the national average of GHS644.00 (GSS, 2008).

The GLSS V report further indicates that about 31 percent of adults (representing a little over 4 million people) have never been to school. A further 17 percent (representing 2.3 million people) attended school, but did not obtain MSLC/BECE[39] certificate. It also shows a clear gender gap in education with almost twice as many females (2.7 million) as males (1.4 million) never attending school. In addition, there are fewer females (0.7 million) than males (1.1 million) with secondary or higher qualification.

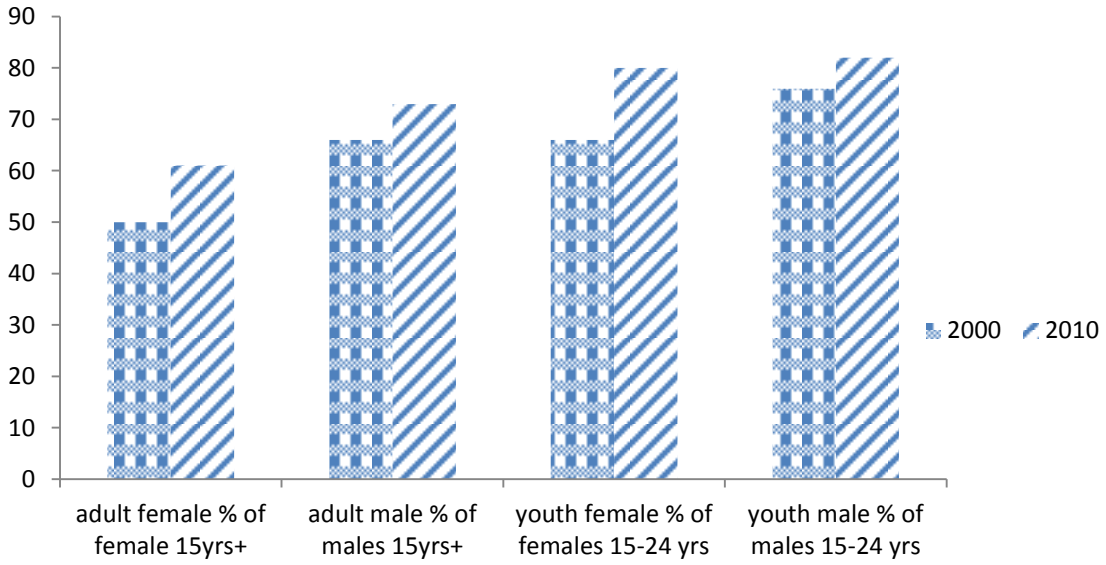


**Figure 5.2: Literacy Rates of Females and Males**

*Source: Author's construction based on the data of World Development Indicators, 2011.*

According to the FAO (2012), the large gender and rural-urban education inequalities have a consequential impact on the labour force of the country as observed in the rural areas where as high as 53 percent of the labour force has no primary education. The rural-urban gap shows that 30 percent of urban females in the workforce have secondary or higher education. The rural situation is alarming because only 3 percent of employed rural women have secondary or higher education (FAO, 2012). However, as illustrated in Figure 5.2, the literacy rate among female youth has improved quite remarkably: a 14 percentage increase was recorded from 2000 to 2010. This is

[39] Middle School Leaving Certificate or Basic Education Certificate Examinations

more than twice the 6 percent literacy growth of the male youth for the same period (World Bank, 2011). A similar trend is observed for the female and male adults presented in Figure 5.2.

The efforts made in the last decade to improve access to education, especially through free primary education, free distribution of school uniforms and books, and capitation grants (free meals for pupils) policies should be expanded to cover many more rural areas. This will not only bridge the inequality gap, but also develop a skilled labour force with enhanced entrepreneurial abilities to create and/or access better employment opportunities. This will equip them to break the grip of poverty and achieve sustainable prosperity.

## 5.4. BRIEF OVERVIEW OF THE MICROINSURANCE INDUSTRY IN GHANA

The microinsurance market in Ghana, although in a nascent stage has witnessed impressive growth in the number of firms, policyholders and underwriting activities. For example, as at the end of 2011, the market had about 1 259 055 microinsurance policyholders, contributed about GHS11 703 488 (US$6 087 473) in premiums and claims of GHS4 421 494 (US$2 299 803) have been paid (Buabeng & Gruijters, 2012). The microinsurance firms in Ghana are subsidiaries/agencies of commercial insurance companies. They provide both life and non-life products such as personal life cover, family life cover, accident cover, fire cover, employer life cover, funeral, medical cover, property, education insurance and savings-linked insurance.

The distribution, premium collections and claims processing and payments are done by the commercial insurers in partnership with rural banks and microfinance institutions located in both the urban and rural areas of the country. What distinguishes these insurance services offered to the informal sector from those of the formal sector are the distribution channels and the structure of the premium payments. For instance, the premium payments are tailor-made to meet the seasonal cash flow of informal sector workers. The clients are sometimes allowed to pay premiums at irregular times and in uneven amounts (Tan, 2012). The insurers have agents who go to the market centres (or place of work) and homes of policyholders almost every week to collect the premiums. The claims processes are less complicated and are normally determined within 7 days and paid within 10 days of receipt (NIC, 2011). The flexibility in the distribution and the premium payments as well as the expeditious processing of claims is the backbone for the extension of insurance to low-income households.

However the growth of the microinsurance industry is challenged by low levels of financial literacy, lack of trust in insurers and the notion that risky events are by providence (Finmark Trust, 2010). The industry is regulated by the same laws meant for the “formal” insurance industry. This law – the Insurance Act, 2006 (Act 724) – according to the insurance regulatory body[40], has significant

[40] The regulatory body of the Ghanaian insurance industry is the National Insurance Commission (NIC).

gaps and is not abreast with the current issues in the industry (NIC, 2011). Since microinsurance is unique, with sector-specific features, and has new emerging characteristics (such as the bundling of premium payments with airtime), its regulation by the "formal" insurance laws may impede its rapid expansion. It is however noteworthy that the NIC has initiated steps to address some of these challenges.

On the other hand the national health insurance is provided by the National Health Insurance Authority (NHIA). It started operations in 2003 as part of the government social intervention program to increase access to health care by eliminating medical payment at the point of delivery. It operates through 145 municipal and district mutual health insurance schemes. Each district distributes its scheme at designated places in rural and urban areas through registered agents and scheme officers who call at homes and work places to register and collect premiums from policyholders. It has over 5 000 service providers which are drawn from public and private hospitals, clinics and pharmacies. For beneficiaries to access health care they are required to follow the "gate-keeper system", that is, first report to a primary care facility, and subsequently to the second and third levels of care by way of referral (NHIA, 2010).

Formal sector workers pay compulsory monthly premiums to NHIA through their social security contributions which entitle them to the service of the health insurance scheme. Informal sector workers are however not bound to join the scheme. They do so voluntarily after paying the required premiums which range from GHS12 to GHS15 (US$8 to US$10) per person yearly. Currently, about 66 percent of the population has signed up for the scheme, of which 4.5 million are from the informal sector. It covers about 95 percent of health conditions in the country and has been recognized as a reliable social intervention policy for financing health care. It has increased access to professional medical care and skilled birth attendance, and protects policyholders, especially low-income households, against emergency borrowing to meet out-of-pocket expenditures. With increasing coverage, health services utilization has also grown, averaging two visits per head per year for insured persons, compared to the national level estimated at 0.5 visits (Matul *et al*., 2010).

## 5.5. THE METHODOLOGY

### 5.5.1. The Data

The 2010 FINSCOPE national household survey on Ghana is used in the current study for the assessment of the influence of microinsurance policies on asset inequality among low-income households. The dataset contains rich information on 3 643 households' demographics, human capital conditions, income and asset distributions, gender characteristics, rural-urban and regional dynamics, financial literacy and access to financial services, risk coping strategies among households, and remittances.

In terms of access to financial services, the dataset can broadly be classified into three categories: (1) access to formal financial services; (2) access to other formal and informal financial services; and (3) no access at all. For the purpose of this study we extracted the dataset concerning the informal and other formal for the analysis. As a result the dataset involving 800 households was extracted for the asset inequality assessment. In this study microinsurance is defined as the extension of insurance services to low-income households living and working in the informal sector. Our definition follows the microinsurance conditions outlined by the National Insurance Commission (NIC, 2011) which stipulates that an insurer cannot designate a product as microinsurance unless it is accessible, affordable and targeted at low-income households. Thus the dataset concerning low-income households living and working in the informal sector who are clients of the National Health Insurance Scheme (NHIS) and private microinsurance companies have been used for the analysis.

### 5.5.2. The Construction of the Asset Index

The asset index has mainly been used to investigate the dynamics and incidence of poverty especially in developing and emerging economies (see e.g. Sahn & Stifel, 2000; Booysen *et al.,* 2008; Njong & Ningaye, 2008; Echevin, 2011; Filmer & Scott, 2012; Harttgen *et al.,* 2013). Its usage as an indicator of inequalities among households, which is relatively new to the empirical literature, has mainly been in the field of educational outcomes. For instance, McKenzie (2004) examined the feasibility of using an asset index to measure inequalities in the absence of reliable income and expenditure data. He then applied the method to Mexican data to estimate inequalities in school attendance among boys and girls and across geographical areas. His empirical findings confirm the theoretical underpinnings that asset indicators provide a better measurement of wealth and good proxies for inequalities in living standards.

The same method was used earlier by Filmer and Pritchett (2001) to estimate wealth levels and school enrolment in India and also by Filmer and Pritchett (1999) for the evaluation of household wealth on educational achievement across 35 counties. McKenzie (2004) and Filmer and Pritchett (1999 and 2001) employed the first principal component analysis (PCA) for the creation of the asset indices. The challenge, however, is that the first principal component is generally appropriate for the estimation of continuous variables and does not assume that the underlying variables (assets) are normally distributed (Booysen *et al.*, 2008). Hence instead of the PCA we have used multiple correspondence analyses (MCA) for the creation of the asset index.

The MCA is a new version of the PCA and is designed for the analysis of categorical variables. Its ability to analyse categorical variables such as yes-no questions and asset ownership questions makes it very suitable for this study. Following Asselin (2009) and Echevin (2011) we created the asset index under this basic form:

$$a_i = \sum_{k=1}^{k} F_{1k}\, d_{ki} \qquad 5.1$$

The *i*th household asset index is $\alpha_i$, $d_{ki}$ is the *k*th value of the categorical variables (with k=1… K) indicating the household's asset variables included in the index construction, and $F_{1k}$ is the MCA weights generated for the analysis. The asset index comprises twelve (12) private households' assets ranging from ownership of television or radio to refrigerator and two public utilities, access to water and electricity.

**Table 5.2: Weights Generated from the MCA[41]**

| Variables | Categories | Weights |
|---|---|---|
| ***Private Assets*** | | |
| Mobile Phone | Owns a mobile phone | 0.2020 |
| | Does not own a mobile phone | -2.7910 |
| Microwave | Owns a microwave | 2.1460 |
| | Does not own a microwave | -0.4130 |
| TV | Owns a TV | 0.6200 |
| | Does not own a TV | -1.2250 |
| Refrigerator | Owns a refrigerator | 1.1060 |
| | Does not own a fridge | -1.2630 |
| Kitchen condition | Has built-in sink | 2.0060 |
| | No built-in sink | -0.5100 |
| Radio | Owns a radio | 0.1960 |
| | Does not own a radio | -1.2260 |
| DVD Player | Owns a DVD player | 0.9320 |
| | Does not own a DVD player | -1.7690 |
| Motor Cycle | Owns a motor cycle | 0.1620 |
| | Does not own a motor cycle | -0.0130 |
| Cooking fuel | Electricity | 1.8000 |
| | LPG gas | 1.3260 |
| | Kerosene | 1.1100 |
| | Charcoal/wood | -2.6800 |
| | Others | -0.1060 |
| Tractor | Owns a tractor | 2.0090 |
| | Does not own a tractor | -0.0150 |
| Toilet | Flush toilet | 1.4660 |
| | Pit latrine | -1.2620 |
| | Bush/beach/open field | -2.0520 |
| | Others | -0.8530 |
| House Ownership | Rented | 0.3980 |
| | Family owned | -0.3190 |
| | Occupied without payment | 0.0780 |
| | Others | 0.2290 |
| ***Public Facilities*** | | |
| Electricity | Has electricity | 0.4730 |
| | Does not have electricity | -2.7490 |
| Water Source | Piped into house | 1.9310 |
| | Well in house | 0.7320 |
| | Public pipe | -2.6250 |
| | Public well | -1.7380 |
| | Surface water | -14.240 |
| | Others | -0.8530 |

Source: Author's coputation based on the 2010 FINSCOPE data of Ghana.

The use of household assets instead of income or expenditure to measure welfare levels has been argued to be more theoretically appropriate and empirically reliable. For development reasons the asset index may capture wealth inequalities much better than income or expenditure inequalities. Practically data about households' income face challenges in accuracy and measurement (Moser & Felton, 2007) due to recall bias, mis-measurement and the seasonal flow of income of most informal sector workers (McKenzie, 2004). In addition income of informal workers may be highly

[41] Since it is not possible to get negative asset (wealth), the negative asset index values were converted into positive values by adding a common value (2.8) across both the negative and positive asset index values.

variable and lumpy thus less reliable for measuring wealth inequality than workers in the formal sector receiving regular income (Moser & Felton, 2007).

Using an asset index to measure welfare resolves the measurement limitations, recall bias and households reluctance to divulge sensitive information concerning their income or expenditure levels. For instance it is much easier for households to respond to yes–no questions concerning whether the household owns a radio or, has electricity, toilet, piped water etc., than to divulge information about sources and level of income or to recall consumption expenditure incurred over the previous month (McKenzie, 2004).

In addition, assets are less volatile than income and consumption expenditure and hence short to medium-term economic changes in households' conditions may not alter their asset levels substantially (Booysen *et al.*, 2008). The build-up of assets takes longer time and therefore provides better insight into the long-term living standards of households than income and consumption expenditure (Moser & Felton, 2007). The theoretical underpinnings of using wealth levels or asset-based indicators to estimate physical and human capital investment and economic growth has also been proven in studies such as Birdsall and Londono (1997), Banerjee and Newman (1993), Galor and Zeira (1993), Bardhan *et al.* (1999) and McKenzie (2004).

### 5.5.3. The Asset Inequality Estimations through the Gini Coefficient

After the creation of the asset index through the MCA, the Gini coefficient was then used to estimate the asset inequality across gender and the rural-urban parity in all ten regions of Ghana. The calculation of the asset Gini follows the procedure for estimating the income Gini. The Gini index is used to calculate inequality levels among groups of people regarding the distribution of income, wealth, assets, land, education, food consumption, health and social class. It is calculated from a particular Lorenz curve (Farris, 2010) and hence is expressed visually in Figure 5.3 as the area between the Lorenz curve and the line of perfect equality, divided by the total area under the line of perfect equality (McKay, 2002). From the following Lorenz curve, the basic Gini co-efficient formula is given as:

$G = \frac{A}{(A+B)}$, where $(A + B) = 0.5$, hence, $G = 2A = 1 - 2B,$ 5.2

In the absence of a Lorenz curve, equation (5.3) can be used to determine the Gini inequality index (Damgaard, 2000).

$$\mathrm{L(y)} = \frac{\int_0^y x dF(x)}{\mu} \qquad 5.3$$

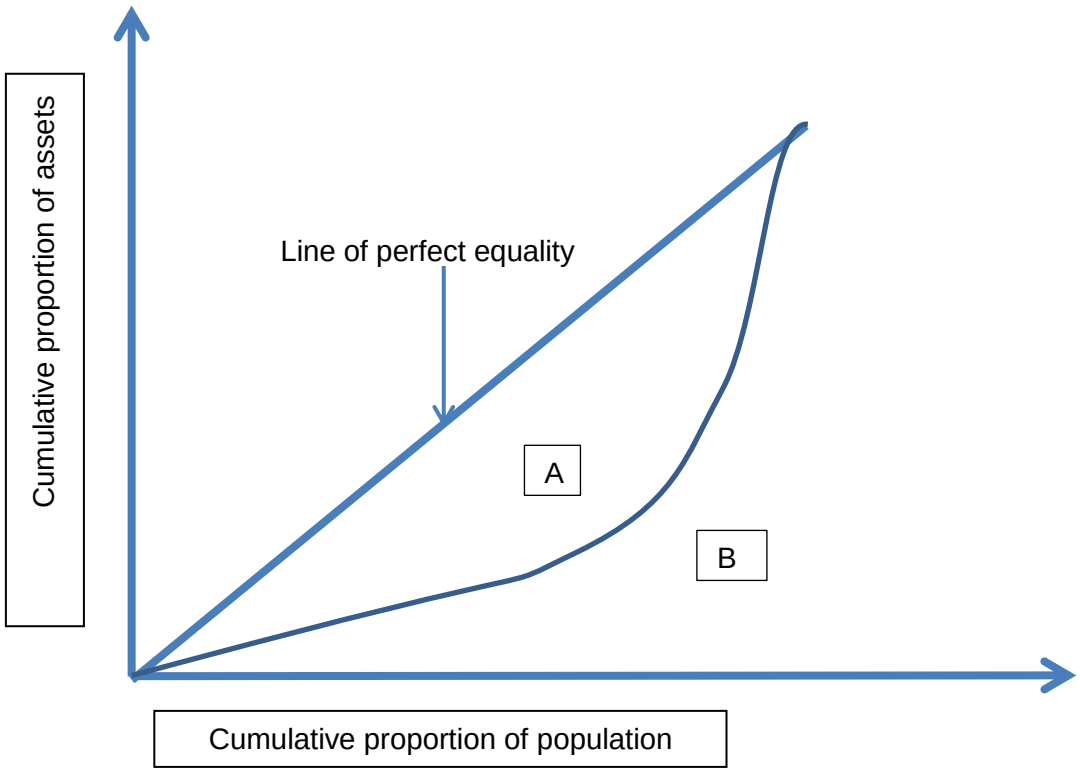


**Figure 5.3: The Lorenz Curve**

The Gini index is mostly used to evaluate income inequality, and has rarely been used to determine asset inequality. In this study we have adopted the income Gini outlined by Dorfman (1979) to suit our measurement of households' asset inequality.

$$G = 1 - \frac{1}{\mu} \int_0^{y^*} (1 - F(y))^2 dy \qquad 5.4$$

Where $F(y)$ is the cumulative proportion of household assets; $\mu$ is the mean of the distribution and y* is its upper limit. The asset Gini index ranges from zero (perfect equality) to a maximum value of one (that is, perfect inequality, an extreme situation in which one household has all the assets).

## 5.6. RESULTS AND DISCUSSION

### 5.6.1. The Profile and Characteristics of the Sampled Households

In order to ascertain that the households under study are relatively similar in characteristics and socio-economic strength, a chi-square distribution of both the insured and uninsured households is presented in Table 5.3. The percentage trend indicates that insured and uninsured households have similar living standards and socio-economic characteristics. In particular, the income of insured households is not significantly different from that of uninsured households. Income is noted in the household economics literature to be an important determinant of asset accumulation. The

chi-square test indicates that the income of uninsured households does not differ from that of the insured. To the extent that income is not statistically significant, asset inequality between the two groups of households may not be influenced by income.

**Table 5.3: Chi-Square Test on the Profile of Insured and Uninsured Households**

| Variable | Uninsured HH (%)[C] | Insured HH (%)[C] | Chi-Square ($\chi^2_{.050}$) |
|---|---|---|---|
| Resp. Age[T] (mean years) | 38.02 | 39.81 | -1.7918 (0.0652)[T] |
| ***Resp. Gender*** | | | 0.1014 (0.750) |
| Male | 47.13 | 48.40 | |
| Female | 52.87 | 51.60 | |
| ***Resp. Marital Status*** | | | 2.2049 (0.138) |
| Married | 51.65 | 57.57 | |
| Others | 48.35 | 42.43 | |
| ***Resp. Education Level*** | | | 8.4240 (0.015)** |
| No formal Education | 13.17 | 7.78 | |
| Primary Education | 45.27 | 40.96 | |
| Secondary and above | 41.56 | 51.26 | |
| ***Household Income*** | | | 0.4930 (0.782) |
| 0 – GHS400 | 69.31 | 66.36 | |
| GHS401 – GHS1000 | 24.87 | 26.97 | |
| Above GHS1000 | 5.82 | 6.67 | |
| HH Size[T] (mean size) | 3.41 | 4.00 | -0.586 (0.0034)***[T] |
| ***House Ownership*** | | | 0.2135 (0.899) |
| Rented | 32.79 | 34.47 | |
| Family Owned | 48.36 | 46.80 | |
| Occupied without payment | 18.85 | 18.72 | |
| ***Location*** | | | 0.0023 (0.962) |
| Urban | 68.44 | 68.26 | |
| Rural | 31.56 | 31.74 | |
| ***Economic Activity*** | | | 0.3053 (0.581) |
| Farming Enterprise | 29.92 | 31.96 | |
| Non-Farming Enterprises | 70.08 | 68.04 | |
| ***Proximity to Financial Inst*** | | | 0.1176 (0.732) |
| 10 – 30 minute walk | 69.23 | 67.62 | |
| Above 30 minute walk | 30.77 | 32.38 | |
| ***Access to Credit*** | | | 5.1651 (0.023)** |
| Never borrowed | 54.51 | 45.43 | |
| Have borrowed | 45.49 | 54.57 | |
| ***Remittances*** | | | 7.4542 (0.006)*** |
| Do not Receive Remittance | 52.92 | 63.68 | |
| Receives Remittances | 47.08 | 36.32 | |

Note: *** and ** indicate 1 and 5 percent significance levels respectively; [C] indicates that the addition for each variable is by columns; [T] indicates T-test instead of Chi-square.
Source: Author's computation based on the 2010 Finscope Data of Ghana

### 5.6.2. Tests for Selection Bias

The demand for microinsurance can be influenced by selection bias such as self-selection, endogeneity and program placement bias. Without controlling for these, the actual effect of microinsurance on any welfare indicator can be blurred. To account for selection bias, we run a Heckman selection model to determine whether our sample population suffers from selection bias. The Heckman model uses a two-stage estimation procedure to test and control for selection bias (Heckman, 1979). In the first stage a probit model is estimated to capture the determinants of microinsurance uptake. The estimated parameters of the probit model are then used to calculate the inverse Mills ratio, which is used as an additional explanatory variable in the second stage equation (Lin, 2007; Janzen & Carter, 2013). The results indicate that selection bias as captured by the inverse Mills ratio is not statistically significant, which is an indication that our sample population does not suffer from selection bias. The result of the test is presented in Table B.1 in Appendix B.

### 5.6.3. Asset Inequality

We used the Lorenz curve to graph the level of asset inequality among low-income households across the ten regions of Ghana. It indicates that the poorest 10 percent of the population have 2 percent of the total household assets; the poorest 20 percent have 7 percent, while the richest 20 and 10 percent have 75 and 85 percent of the household assets respectively.

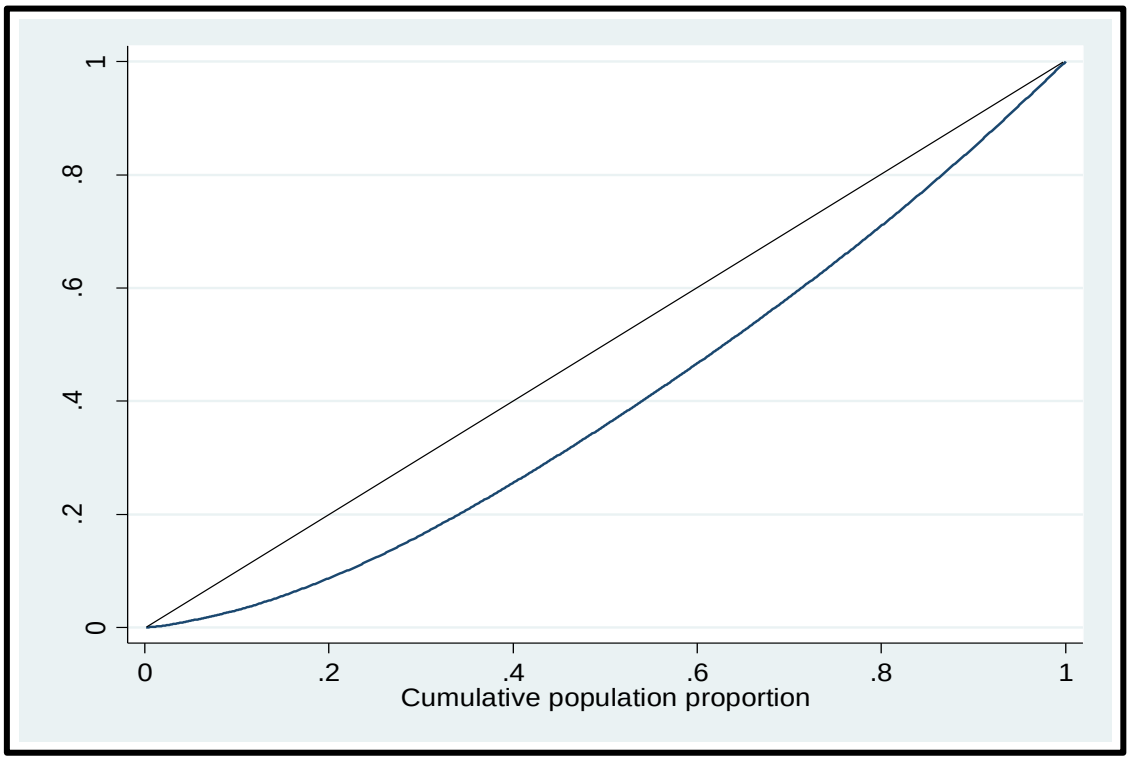


**Figure 5.4: Lorenz Curve for Household Assets**

Source: Drawn by author based on the 2010 FINSCOPE Data of Ghana.

Table 5.4 summarizes the extent of asset inequality between gender and across localities. The overall asset inequality is twice as high in rural areas as in urban settings. This sharp disparity between the rural and urban divide is less profound in the gender ownership of assets. For instance, the gender inequality gap in asset holdings in the urban centres is just 1 percentage point, while that of rural males and females is at par. This seems to suggest that the enormous asset inequality in Ghana has little to do with gender issues. The real differences are however observed between genders across the rural-urban divide. For example, whereas male and female-headed households in urban areas have relatively lower asset inequality rates of 13 and 14 percent respectively, asset inequality of their counterparts in the rural areas is twice high. Surprisingly, male-headed households in rural areas have twice as much asset inequality as female-headed households in urban areas.

**Table 5.4: Asset Gini Coefficient**

| Asset Inequality | | | |
|---|---|---|---|
| Locality | All | Male | Female |
| Urban | 0.14 | 0.13 | 0.14 |
| Rural | 0.28 | 0.28 | 0.28 |

Source: Author's computations based on 2010 FINSCOPE Data, Ghana.

Another useful way of understanding the large degrees of asset inequality is to draw a comparison across the entire sampled population. Table 5.5 accomplishes this comparison by providing the percentile distributions of the asset inequality across intra-genders. Considerable variations in asset ownership exist between the bottom $10^{th}$ percentile and the upper $10^{th}$ percentile. Asset ownership of male-headed households in the top $10^{th}$ percentile is about four times higher than that of the bottom $10^{th}$ percentile, while female asset ownership in the top $10^{th}$ percentile is more than three times as large as the bottom $10^{th}$ of the distribution.

The asset disparity is even more profound between the top and bottom distribution relative to the median. For example, whereas the bottom 1 percentile deviates substantially from the median by as much as 8 times, the top 1 percentile deviate from the median by just 1.5 times. The top and bottom asset ownership disparities are enormous, with the top 1 percentile far outdistancing the bottom 1 percentile by about 12 times.

**Table 5.5: Percentiles Distribution of Assets by Gender.**

| Asset Inequality | | | |
|---|---|---|---|
| Percentiles | All | Male | Female |
| 1 | 0.37 | 0.37 | 0.39 |
| 5 | 0.91 | 0.91 | 0.91 |
| 10 | 1.22 | 1.14 | 1.25 |
| 25 | 2.15 | 2.15 | 2.11 |
| 50 | 2.96 | 2.98 | 2.96 |
| 75 | 3.54 | 3.45 | 3.57 |
| 90 | 4.05 | 3.99 | 4.17 |
| 95 | 4.25 | 4.25 | 4.25 |
| 99 | 4.33 | 4.33 | 4.34 |

Source: Author's computations based on 2010 FINSCOPE Data, Ghana.

Table 5.6 also highlights the extent of disparities in rural and urban areas at selected percentiles of the asset distribution. The bottom $10^{th}$ percentile of urban households' asset ownership is 2.10 while the corresponding asset ownership of rural dwellers is 0.78, indicating a very significant gap of 132 percent. The observed intra-spatial (intra-urban and intra-rural) differences are even more disturbing. The asset ownership gap between the bottom $10^{th}$ and the upper $10^{th}$ percentiles in the urban areas is a remarkable 225 percent, which is an indication that the gap between the urban non-poor and poor even among households in the informal sector is big and thus demands concerted efforts to bring it under control. The story of the rural non-poor and poor is much worse with the non-poor overwhelmingly outpacing the poor by 322 percent.

**Table 5.6: Distribution of Assets, Rural-Urban Divide**

| Asset Inequality | | | |
|---|---|---|---|
| Percentiles | All | Urban | Rural |
| 1 | 0.37 | 1.04 | 0.32 |
| 5 | 0.91 | 1.63 | 0.57 |
| 10 | 1.22 | 2.10 | 0.78 |
| 25 | 2.15 | 2.73 | 1.15 |
| 50 | 2.96 | 3.20 | 1.91 |
| 75 | 3.54 | 3.75 | 2.77 |
| 90 | 4.05 | 4.25 | 3.31 |
| 95 | 4.25 | 4.26 | 3.65 |
| 99 | 4.33 | 4.35 | 4.00 |

Source: Author's computations based on 2010 FINSCOPE Data, Ghana.

### 5.6.4. The Effect of Microinsurance on Asset Inequality

This section advances the analysis by investigating the influence of microinsurance on the levels of inequalities observed among low-income households. In particular, we determine whether commercial microinsurance and the government health insurance products can lower asset inequalities. The computed asset inequality is presented in Table 5.7. The first part[42] of Table 5.7 deals with the influence of private microinsurance on asset inequality, while the second part refers to the effect of the government-based microinsurance on asset inequality. Column 2 shows the average asset Gini for gender, rural-urban divide and the ten administrative regions. Columns 3 and 4 reveal the asset Gini for the uninsured and the insured respectively; while column 5 presents the differences between the asset Gini of the uninsured and the insured households.

The total asset inequality (column 2) indicates no gender disparity among low-income households in asset holdings. This result suggests that among low-income households, female-headed households do not lag behind their male counterparts in asset ownership. Unsurprisingly, the result shows that rural households have twice as much asset inequality as urban households. This finding confirms the empirics (see e.g. Ravallion *et al.,* 2007; Booysen *et al.,* 2008; Echevin, 2011; Sahn & Stifel, 2003) that rural dwellers are unambiguously disadvantaged in terms of acquisition of critical assets for welfare enhancement.

The regional trend indicates higher asset inequalities in Brong Ahafo, Upper East and West, with the Northern region having the highest asset inequality which is three times greater than that of Greater Accra region. Even among insured households, the trend observed in both Brong Ahafo and Northern regions is unusual. They are the only regions where insured households' asset inequality is higher than both the regional averages and uninsured households. This unusual trend is observed for Brong Ahafo region in both the government and private microinsurance schemes and for Northern region in only the private schemes. The contextual issues of these regions may be the possible reasons underlying these unusual observations. They have the largest land size in Ghana. The geographical area of Northern and Brong Ahafo regions are 70 384 sq.km and 39 557 sq.km respectively (GSS, 2013), which translates into 46.1 percent of the total land size of Ghana. Nevertheless, they are among the most least developed and poorest regions of the country, with little access to amenities to needed for asset build-up. This may imply that insurance matters, but in the absence of development or in the presence of development gaps which may limit asset availability, insurance may not do much to bridge the inequality gap.

The Upper East region has the highest inequality gap between insured and uninsured households under both schemes. The asset inequality of uninsured households in the region is 26 percent

[42] The definitions of the columns in the first part of Table 7 apply to the second part.

greater than that of insured households under the private microinsurance schemes. A similar trend of 16 percent is observed for the same region under the government scheme.

**Table 5.7: Gini Coefficient of the Asset Index**

| Variables | Private Microinsurance Schemes | | | | Government Health Insurance Scheme | | | |
|---|---|---|---|---|---|---|---|---|
| | Average Gini | Uninsured | Insured | (UNI-INS) | Average Gini | Uninsured | Insured | (UNI-INS) |
| Asset Gini | 0.20 | 0.22 | 0.19 | 0.03 | 0.20 | 0.22 | 0.18 | 0.04 |
| ***Gender*** | | | | | | | | |
| Male | 0.20 | 0.22 | 0.19 | 0.03 | 0.20 | 0.21 | 0.19 | 0.02 |
| Female | 0.20 | 0.22 | 0.18 | 0.04 | 0.20 | 0.22 | 0.17 | 0.05 |
| ***Locality*** | | | | | | | | |
| Urban | 0.14 | 0.16 | 0.12 | 0.04 | 0.14 | 0.15 | 0.12 | 0.03 |
| Rural | 0.27 | 0.29 | 0.26 | 0.03 | 0.27 | 0.31 | 0.25 | 0.06 |
| ***Regions*** | | | | | | | | |
| Western | 0.22 | 0.24 | 0.21 | 0.03 | 0.22 | 0.26 | 0.19 | 0.07 |
| Central | 0.20 | 0.24 | 0.17 | 0.07 | 0.20 | 0.24 | 0.15 | 0.09 |
| Greater Accra | 0.11 | 0.13 | 0.10 | 0.03 | 0.11 | 0.12 | 0.11 | 0.01 |
| Volta | 0.24 | 0.38 | 0.21 | 0.17 | 0.24 | 0.23 | 0.20 | 0.03 |
| Eastern | 0.19 | 0.25 | 0.16 | 0.09 | 0.19 | 0.27 | 0.16 | 0.11 |
| Ashanti | 0.13 | 0.14 | 0.13 | 0.01 | 0.13 | 0.15 | 0.13 | 0.02 |
| Brong Ahafo | 0.25 | 0.20 | 0.29 | -0.09 | 0.25 | 0.25 | 0.29 | -0.04 |
| Northern | 0.34 | 0.34 | 0.35 | -0.01 | 0.34 | 0.39 | 0.30 | 0.09 |
| Upper East | 0.29 | 0.47 | 0.21 | 0.26 | 0.29 | 0.38 | 0.22 | 0.16 |
| Upper West | 0.25 | 0.32 | 0.25 | 0.07 | 0.25 | 0.38 | 0.25 | 0.13 |
| Total | **3.23** | **3.82** | **3.02** | **0.80** | **3.23** | **3.78** | **2.91** | **0.87** |

Note: UNI is Uninsured Households; INS is Insured Households.

Source: Author's computations based on the 2010 FINSCOPE data of Ghana

A comparison between average asset Gini and insured households indicate a consistent lower asset inequality among the insured across both genders, in the rural-urban setting and in eight of the ten regions. The overall asset Gini of insured households (under the private microinsurance schemes) is 21 percent less than the average asset Gini across all the variables. In contrast, the Gini inequality among the uninsured households (column 3) is persistently higher than the average asset inequality between genders and across all the geographical variables except in two regions. Indeed the combined asset inequality of the uninsured households is 59 percent higher than the average asset inequality across gender and locations. The asset inequality of uninsured female-headed households is 4 percent higher than that of insured female-headed households. This trend is also observed in the government schemes among insured female-headed households and uninsured female-headed households. Similarly, the asset inequality of uninsured rural dwellers is greater than that of insured rural dwellers by 3 percent and 6 percent under the private and government schemes respectively.

The general influence of the government health insurance scheme in lowering asset inequality is even more substantial than the private microinsurance. It has an asset inequality lower than the average asset inequality by 31 percent, compared to 21 percent for the private microinsurance. The regional breakdown indicates that, apart from Brong Ahafo, households with the government health insurance scheme have asset inequality levels below or equal to the average asset inequality index. With regard to gender, female-headed households under the government scheme have lower asset inequality than male-headed households. Interestingly, uninsured female-headed households have much higher asset inequality than both uninsured males and insured male-headed households. This may imply that insured female-headed households are much better off than uninsured female-headed households.

The overall trend in the results shows that insured households have relatively lower levels of asset inequality than the uninsured. This confirms the findings of Burkhauser and Simon (2010), Erksoy *et al.* (1995) and Countryman (1999). Insurance may not necessarily lead to direct purchases of more assets and hence reduce inequality, however, the indemnity cover enjoyed by the insured prevents asset losses and thus frees up other financial resources, such as savings, for more asset acquisitions. This relationship between insurance indemnity and asset loss prevention is the most important factor that reduces asset inequality among insured households as witnessed in the analysis above.

## 5.7. CONCLUSION AND POLICY RECOMMENDATIONS

Microinsurance is noted for its ability to enable low-income households to manage risks proactively, prevent asset loss and make a sustainable exit from poverty. In this study we have

assessed the influence of private and government microinsurance schemes on asset inequality among low-income households in Ghana.

The results indicate that insured households have lower levels of asset inequality than uninsured households. Interestingly, insured female-headed households benefit more from both schemes than insured male-headed households, while uninsured female-headed households are worse off than their uninsured male counterparts. The geographical dimension shows that insured rural dwellers have lower asset inequality than the rural uninsured. However, the analyses of Northern and Brong Ahafo regions reveal that large developmental gaps may limit the effect of microinsurance on the asset inequality gap.

The findings of this study require policy directions and actions that will encourage more low-income households to take up microinsurance schemes. For instance, microinsurance firms have been using the regulations of the “formal” insurance companies to regulate their activities. However, the unique nature of the microinsurance industry demands a separate policy and regulatory framework to operate effectively. A strong and robust regulatory framework that meets international standards will encourage more microinsurance firms to enter the market.

Large scale extension of microinsurance to the urban poor and millions of poor people living in geographically disperse and remote rural areas entail a lot of efforts and high transaction costs. Indeed high transaction costs involved in reaching the lower end of the market have compelled most insurers to locate in the national capital and other large towns. A public policy that will reduce the cost of transactions may incentivize more insurers to extend microinsurance services to many remote areas. For example, the current rural banking policy that gives tax exemptions to rural banks in their first five years of establishment could be replicated in the microinsurance sector.

Achieving depth and large scale extension in a cost-effective manner can also be done through the use of mobile phone technology. The concept of mobile banking has proven to be cost effective in extending banking services to millions of poor households who were previously excluded from formal banking. A “mobile microinsurance” can be designed along the lines of the mobile banking concept to meet the specific needs of microinsurance transactions. Already two mobile companies have started bundling microinsurance with their services. A formal policy and regulatory backing will increase the confidence of the public in “mobile microinsurance” and possibly encourage other entities to venture into it. This will not only increase the uptake of microinsurance, but it will equip low-income households to protect their assets against risk, escape poverty and gradually bridge the asset inequality gap. Future studies may consider using panel data to analyse the dynamic influence of microinsurance on asset inequality.

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# CHAPTER 6
# DOES MICROCREDIT INCREASE HOUSEHOLD WELFARE IN THE ABSENCE OF MICROINSURANCE?[43]

## 6.1. INTRODUCTION

Micro financial services – microcredit, microsavings and microinsurance – can help households manage exposure to risks and improve household welfare through income and consumption smoothing, asset accumulation and women empowerment. Microcredit provides low-income households with funding in a timely manner to acquire essential assets and meet certain unexpected expenses. This has facilitated the growth of its customers in developing countries from 16.5 million in 1997 to 154.8 million clients in 2007 representing 838.2 percent growth (Daley-Harris, 2009). Microcredit, especially productive loans, has been found to increase per capita household income (Imai & Azam, 2010), enhances households' multidimensional well-being and improves the living standards of rural folks (Adjei *et al.,* 2009; Imai *et al.,* 2010).

Similarly, microinsurance is the defence of low-income households living and working in the informal sector against specific risks in exchange for regular premium payments proportionate to the probability and cost of the risk involved (Churchill, 2007). It is a risk transfer tool that helps low-income households to escape poverty traps (Dercon, 2003) by protecting them against the financial consequences of life-cycle risks (Binnendijk *et al*., 2012). Combining microinsurance with microcredit or microsavings services may ensure that income and consumption smoothing is done with ease. It may eliminate asset pawning or liquidation at "give-away" prices and thus promotes financial stability among low-income households. These three micro financial services complete the risk management toolkit needed by low-income households to manage risk effectively and efficiently in order to improve their welfare outcomes.

Although microcredit has a lot of potential for extending markets, increasing welfare and fostering socio-economic change, it presents a number of puzzles, many of which have not yet been resolved conclusively (Armendariz and Morduch, 2010). In particular the available empirical evidence about its impact on households' welfare has been inconclusive and controversial. Whereas one group of researchers (such as Schuler *et al.,* 1997; Pitt and Khandker, 1996) provide evidence of the beneficial socio-economic impact, others such as Adams and Von Pischke (1992) and Rogaly (1996) indicate otherwise.

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[43] Under review at *World Development.*
An extract from this paper was presented at the Economic Society of South Africa Biennial Conference, 25-27 September, 2013, University of the Free State, Bloemfontein, South Africa.

The current study seeks to stimulate discussion into new ways of making microcredit a welfare enhancing instrument. This discussion may help researchers and policy makers to resolve the controversies generated among the three strands of the literature. Microcredit may be good, but its true potential to improve the welfare of the poor is best realized in combination with an appropriate microinsurance scheme. The trap of poverty is not only the lack of credit, but also life cycle and economic risks that threaten the very survival of the poor. Thus giving them credit without indemnifying them against risks may have little or no positive impact on them. Whereas microinsurance covers the health, funeral, fire, theft, drought and economic risks of the poor, microcredit enhances their income generating capacity through the financing of new machines, improved seeds for cultivation, improved animal breeds and expansion of microenterprises.

In the event of risk the pay-out from microinsurance ensures that microcredit funds are not diverted to resolve the risky event. Hence advancing microcredit to the poor in combination with microinsurance will equip them to face the shackles of poverty head-on and make a permanent escape from poverty. The evidence emerging from this line of thought confirms that microcredit if combined with microinsurance can improve the well-being of the poor. For instance, Chakrabarty (2012) reports that microcredit in combination with microinsurance has a very strong effect in reducing child labour among extremely poor households in Bangladesh.

Much of the attention of the studies on combined microfinance – microcredit in combination with microinsurance or microsavings – has been focused on microfinance institutions' (MFIs) product diversification (see e.g. Caplan, 2008; Labie, 2009; Kwon, 2010) and on MFIs sustainability and productivity (Rossel-Cambier, 2012). The literature indicates that combined microfinance can be beneficial to MFIs in the form of reduced overhead costs resulting from integrated client administration, lower transaction cost, wider outreach and client loyalty (Morduch, 2004; ILO, 2007). It also improves loan repayments rates (Bond and Rai, 2009) as well as the efficiency and productivity of MFIs (Rossel-Cambier, 2012).

This study seeks to re-focus the research into combined microfinance on the clients rather than on MFIs in order to determine whether combined microfinance inure to the benefits of low-income households. In particular we ask: are combined microfinance products better than stand-alone products in improving the welfare of low-income households? To this extent, it is worth exploring whether the combination of microcredit with microinsurance either enhances the welfare of low-income households or makes them even more vulnerable.

We examine this research question through the use of an asset index instead of money metric income and consumption expenditure as a measure of welfare of low-income households. To control for selection bias and endogeneity we employed three empirical models: Heckman sample

selection, treatment effects and instrumental variable models to estimate the individual and the combined effects of microcredit and microinsurance on household welfare.

This chapter is organized as follows: the review of the literature is captured in section 6.1, section 6.2 provides an overview of the microfinance industry in Ghana; the methodology is in section 6.3, the results are presented and discussed in section 6.4 and the conclusion is presented in section 6.5.

## 6.2. LITERATURE REVIEW

Microfinance exists to meet the needs of those households and microenterprises which have been excluded or segmented out of the formal financial market due to reasons such as clients lack of tangible collateral, perceived as highly risky due to informational opacity and the high transaction cost involved in intermediating for such low-income clients (Abor & Biekpe, 2006; Tagoe *et al.,* 2005). The extension of credit to low-income earners assists in the creation of households microenterprises, which helps to generate employment and extra income for poor households and villages (Bateman, 2010). The additional income generated enhances the welfare of households through improved nutrition and consumption, investment in household members' education, and some modest investment in productive and households' durable assets.

According to Bateman (2010:25), "poverty is not simply a lack of income; it is also a lack of income at the time it is needed". Hence for the poor, getting microcredit to smooth out certain key household consumption expenditures is a great relief afforded them by MFIs. For instance, during the lean or dry season, rural farmers are assisted by microloans to meet their households' health and education expenditures. Such loans, which are then repaid during the harvesting period, enable poor farmers to compensate for the ups and downs of economic life and overcome vulnerability (Bateman, 2010). By aiding households to smooth out consumption of essential expenditures such as health and education, microfinance enhances the capacity of the poor to increase their skills and value on the job market, which is critical for sustainable poverty reduction.

Despite acknowledging the potential welfare enhancing effect of microcredit services, Bateman (2010) provoked an intense debate about the ability of microfinance to lead to sustainable improvement in the welfare of poor households. He argued that the so-called welfare impact vehicles – income and employment generation, consumption smoothing, gender empowerment and a helper of the helpless (poorest) – through which microfinance is acclaimed to impact positively on the poor are all myths and "largely built on hype and on egregious half-truths". He further posits quite strongly that "microfinance is largely *antagonistic* to sustainable economic and social development, and so also to sustainable poverty reduction. Put simply, microfinance does

not work" (Bateman, 2010:1). The crux of his argument is that microfinance is a poverty trap and an anti-development policy.

### 6.2.1. The Empirical Literature

The empirical literature concerning the microfinance industry is growing in leaps and bounds and so are the controversies regarding its capacity to equip the poor to escape the poverty trap. The evidence concerning its effects on welfare is very much inconclusive, ranging from the very radical position of Bateman (2010) that microfinance does not work as well as the near zero impact in Thailand (Cull *et al.,* 2009) to the remarkable positive effects in Bangladesh (Imai & Azam, 2010). This section reviews three strands of the empirical literature: studies showing positive, negative and mixed/zero impacts of microcredit.

On the positive side, Imai *et al.* (2010) used the nation-wide cross sectional data of India collected by the Small Industries Development Bank of India (SIDBI) on 5 260 clients and non-clients of 20 MFIs affiliated to SIDBI. The authors used an index based on households' food security and socio-economic characteristics to rank households on five index-based ranking indicators ranging from the very poor households to households with surplus resources. They then employed the treatment effect model to estimate the effects of microfinance productive loans on household poverty alleviation. Propensity score matching and Tobit regression were used to augment and check the robustness of the results. Their findings indicate that microfinance productive loans have a significant positive influence on households' welfare outcomes and that this positive impact is more profound in rural areas than in urban centres.

In a similar study Imai and Azam (2010) used four series of national panel data of the Bangladesh Rural Employment Support Foundation (PKSF) collected on 3 000 participants and non-participants households of 13 MFIs across Bangladesh. The study reports that access to MFIs' productive loans has a significant increasing impact on households' per capita income, but access to general loans does not. The paper further indicates that the analysis of each series of the panel data shows a reducing trend of the strength of microfinance to equip households to reduce poverty: that is, the capacity of microfinance to reduce poverty, even though positive, is at a reducing rate. The authors thus conclude by calling for the re-focusing of microfinance on its primary objective of reducing poverty and the need to monitor loans utilization.

A similar study in Ghana on a cross-section survey of 547 households was conducted by Adjei *et al.* (2009) to evaluate how the products of one microfinance institution – Sinapi Aba Trust (SAT) – facilitates asset build-up among the program participants. In particular, the study assessed how access to loans and loan amount influenced the tendency of participants to save money and to join a welfare scheme. In addition, the impacts of access to loans and loan amount on clients' human

capital and physical capital was evaluated. The study reports that participation in the SAT program enhances clients' savings culture and increases enrolment in the welfare scheme, which in turn reduces clients' vulnerability to crisis. It further indicates that clients are better equipped by SAT to provide better education and health care for their households and to acquire durable assets.

The distributional impact of the financial system with and without the microfinance industry of Bangladesh was evaluated by Mahjabeen (2008). The social accounting matrix data of Bangladesh for the period 1999 to 2000 was analysed through the basic and extended version of general equilibrium techniques by the author to ascertain the real impacts of MFIs. The evidence provided by the study indicates that microfinance has a positive impact on households' income and expenditure levels, decreases inequalities and improves welfare. This finding lends support to earlier studies about Bangladesh (Pitt & Khandker, 1998; Khandker, 2005) that microfinance is a potent developmental tool and has the potential to lift the poor from poverty trap, reduce economic inequalities and facilitate the rapid attainment of the millennium development goals.

Other studies on microfinance and women empowerment (Pitt *et al.,* 2006; Pitt *et al.,* 2003; Pitt *et al.,* 1999; Pitt & Khandker, 1998; Sharma & Zeller, 1997; Hulme & Mosley, 1996) have indicated that microfinance programs enhance female participants': (i) business acumen and decision making skills; (ii) financial and economic resourcefulness; (iii) formation of social capital networks; and (iv) better parenting control in the education, nutrition and health of households members. Female borrowers have also been noted as credit-worthy and thus their participation in a microcredit program improves the productivity and self-sustainability of MFIs (Sharma & Zeller, 1997; Hulme & Mosley, 1996). Similarly, Afrane (2002) provides evidence from quantitative and qualitative studies on two microfinance schemes from Ghana and South Africa that microcredit empowers women to growth their businesses and even perform better than men in enterprise development. He further indicates that microcredit improves the financial independence, self-worth and confidence of women.

Despite the general positive impacts of microfinance on households' welfare, some studies found that MFIs have either negative or no impacts at all on households' poverty reducing efforts. Adams and Von Pischke (1992) argue that microcredit cannot help the poor to escape poverty nor can it improve the economic welfare of the vulnerable. Two studies which have heightened the debate on the welfare enhancing effects of microfinance are that of Pitt and Khandker (1998) and Morduch (1998) on Bangladesh. Whereas Pitt and Khandker (1998) report that microfinance has a positive marginal impact on households' consumption, Morduch (1998) finds an inverse impact of microfinance on consumption.

Morduch's (1998) analysis further reveals that the educational outcomes of program participating households are in fact below that of the control group. The difference between these two studies is

probably due to the selection of the control group since this has been the major hindrance to effective impact evaluation. As Morduch admits, although the control group do not have access to formal microfinance credit, they are nevertheless served by NGOs and other informal lenders. This might have blurred the actual differences between the control group and the treatment group.

Although Coleman (1999) did extremely well to correct selection bias, endogenous program placement and the control group deficiencies, the results reveals that microfinance has no impact on households' poverty reducing efforts. In particular the findings show that: (i) rural banks have a significant adverse effect on men's healthcare expenditure; (ii) some of the women have been trapped in a vicious cycle of high interest debt because they borrow from moneylenders to service the village bank loans; and (iii) the loans are not being invested in any productive venture. Coleman attributed some of the findings to the small loan size and context-specific issues.

Similarly, Annim, Dasmani and Armah (2011:1) report from an investigation into the effect of credit on household food consumption that "access to credit does not contribute to the smoothening of household consumption". Therefore the authors, among others recommend the bundling of insurance with credit in order to enhance the benefits that households derive from credit.

Another group of studies produce mixed results on the welfare effects of microfinance. For example, Kondo *et al.* (2008) indicate that whereas access to loans has a significant positive effect on income and expenditures of richer households, its influence on poorer households is retrogressive. The link between household asset accumulations, human capital investments and micro financial services was also found to be non-existent. Coleman (2006) undertook a survey of 444 households in 14 villages in northeast Thailand between 1995-96 to assess the outreach and the true beneficiaries of micro financial services. Eight villages out of the 14 were randomly selected as treatment villages and, after controlling for program placement bias as well as participants' selection bias, weighted logit regression was used for the econometric estimation. The findings were mixed. Whereas the well to-do participants, especially the village committee members, derived significant positive impacts, the impact on the ordinary members was negligible.

Makina and Malobola (2004) report from their evaluation of the Khula Enterprise Finance Limited of South Africa that microfinance has a significant positive influence on clients' welfare, women's economic empowerment and on microenterprises' access to finance. However, the study also indicates that the desired impact on poor rural communities is minimal. This is an indication that microfinance may not necessarily be for the "very poor" communities as it is originally meant to be. In a cross-country study Hulme and Mosley (1996) also found that the positive impact of microfinance is much more substantial to richer clients than the ultra-poor.

## 6.3. AN OVERVIEW OF THE MICROFINANCE INDUSTRY IN GHANA

Urban areas dominate most sub-Saharan Africa financial markets (Mpuga, 2004) to the detriment of rural folks and microenterprises which remain excluded from the formal financial sector (Hofmeister, 1999). Much of the efforts to extend formal financial services to the excluded have come from MFIs through the support of the international development community. Anecdotal evidence indicates that the journey of the microfinance industry in Ghana began in the Northern Region in 1955 with the establishment of a credit union by Roman Catholic Church missionaries from Canada (Bank of Ghana, 2007; Nanor, 2008). This microfinance idea spread to other parts of the country and, together with the *susu* and rotating savings and credit concepts, the rural financial architecture was laid.

Financial sector reforms and certain key regulations, such as the PNDC Law 328 that allowed the operations of different variant of MFIs, have facilitated the evolution and growth of the microfinance industry tremendously. Firms in the microfinance industry are licensed and regulated by the Bank of Ghana (BoG). As at March 2013, the BoG had licensed 133 rural and community banks (RCBs), 144 savings and loans companies (SLCs), 24 moneylenders and 3 financial NGOs (FNGOs) (see Table 6.1).

**Table 6.1: Types and Number of Registered MFIs in Ghana**

| Type of MFI | Number Registered |
|---|---|
| ***Formal MFIs*** | |
| Rural and community banks | 133 |
| Savings and loans companies | 144 |
| ***Semi-Formal MFIs*** | |
| Credit Unions | 380 |
| Financial NGOs | 3 |
| ***Informal MFIs*** | |
| Traditional money lenders | 24 |

Source: BoG, 2007; ARB Apex Bank, 2012

MFIs are licensed into three business categories: formal MFIs, semi-formal MFIs and informal MFIs (Bank of Ghana, 2007). Examples of the formal MFIs are rural and community banks (RCBs), and savings and loans companies (SLCs). The formal MFIs accept deposits and make loans. They provide financial intermediation to rural communities, create a culture of formal banking among rural dwellers and facilitate the financing of rural microenterprises (Bank of Ghana, 2006). For example, RCBs provide the largest financial intermediation to rural communities and their branch network is about 50 percent of the banking outreach in Ghana (IFAD, 2008).

The semi-formal MFIs are mutual or member-based financial societies. They provide savings and credit products to a defined community such as a trade union, church or any recognized society. In most cases the clients are also the owners and hence such MFIs normally do not offered financial services to the general public. Examples of the semi-formal MFIs are credit unions, financial NGOs and cooperatives. Although the credit unions are under the general supervision of the BoG, they are registered and regulated by the Credit Unions Association of Ghana. They are registered as workplace-based, faith-based or community-based credit unions. The informal MFIs are the traditional moneylenders, *susu* collectors, and the rotating, savings and credit associations (ROSCAs) (Bank of Ghana, 2007).

The MFI sector is faced with enormous challenges which can broadly be decomposed into four: (1) inadequate regulatory and supervisory structures resulting in the setting up of Ponzi schemes and mushrooming[44] of MFIs across the country; (2) very weak governance and risk management structures in most MFIs; (3) low levels of skills and lack of professionalism among most managers of MFIs; (4) low levels of equity capital (Nanor, 2008). Addressing these challenges will unleash the immense potential of MFIs to increase outreach and extend formal financial services to the poor and the "missing middle".

## 6.4. THE METHODOLOGY

### 6.4.1. The Data

The household survey on access and usage of financial services collected by Finmark Trust in 2010 for Ghana was used for this study. The sampling technique involved stratified multi-stage random sampling comprising households in geographically enumerated rural and urban settings in all ten regions of the country. Face-to-face interviews and semi-structured questionnaires were used to gather the data from 3 643 households. The survey contains very rich information on households' demographic features, economic conditions, social backgrounds, asset and income levels, access to social amenities, financial knowledge and risk management, perception about financial institutions, remittances and access to credit, and insurance and savings products.

In terms of access to financial services, the dataset can be broadly classified into three categories: (1) access to formal financial services such as commercial banks; (2) access to other formal financial services (such as microfinance firms, insurance firms, savings and loans companies, rural and community banks) and informal financial services (such as savings clubs, *susu,* ROSCAS); and (3) no access at all. For the purposes of this study we extracted the data set concerning households' usage of informal financial services and other formal financial services. In all 800 households were drawn for the empirical investigation.

[44] The Bank of Ghana has closed down some of these MFIs.

### 6.4.2. The Profile and Characteristics of the Sampled Households

A chi-square[45] test on the profile and economic characteristics of households using microcredit *(HH_Credit)* and those without microcredit *(HH_No Credit)* is reported in Table 6.2. The chi-square distribution indicates that apart from gender and income levels, the two groups of households do not differ statistically from each other in age, family size, education, housing, location, economic activity and access to financial services. Whereas the income of *HH_Credit* is concentrated in the medium quintile (GHS401-GHS1000), households without microcredit are within the bottom and upper quintiles of the income bracket.

**Table 6.2: Chi-Square Test on the Profile of Microcredit participants and Non-participants**

| Variable | HH_Credit (%)[C] | HH_No Credit (%)[C] | Chi-Square ($\chi^2_{.050}$) |
|---|---|---|---|
| Resp. Age[I] (mean years) | 39.568 | 38.744 | -0.8245 (0.234)[I] |
| ***Resp. Gender*** | | | 4.0880 (0.043)** |
| Male | 51.71 | 43.98 | |
| Female | 48.29 | 56.02 | |
| ***Resp. Marital Status*** | | | 1.7085 (0.191) |
| Married | 57.88 | 52.89 | |
| Others | 42.12 | 44.11 | |
| ***Resp. Education Level*** | | | 0.7988 (0.671) |
| No formal Education | 9.20 | 10.24 | |
| Primary Education | 41.38 | 43.67 | |
| Secondary and above | 49.43 | 46.08 | |
| ***Household Income*** | | | 6.8700 (0.032)** |
| 0 – GHS400 | 63.12 | 71.88 | |
| GHS401 – GHS1000 | 31.18 | 21.09 | |
| Above GHS1000 | 5.70 | 7.03 | |
| HH Size[T] (mean size) | 3.79 | 3.79 | -0.0049 (0.490)[T] |
| ***House Ownership*** | | | 1.4629 (0.481) |
| Rented | 36.00 | 31.63 | |
| Family Owned | 45.71 | 49.10 | |
| Occupied without payment | 18.29 | 19.28 | |
| ***Location*** | | | 2.6316 (0.105) |
| Urban | 71.14 | 65.36 | |
| Rural | 28.86 | 34.64 | |
| ***Economic Activity*** | | | 1.2227 (0.269) |
| Farming Enterprise | 33.14 | 29.22 | |
| Non-Farming Enterprises | 66.86 | 70.78 | |
| ***Proximity to Financial Ins*** | | | 1.3151 (0.251) |
| 10 – 30 minute walk | 70.40 | 65.38 | |
| Above 30 minute walk | 29.60 | 34.62 | |
| ***Remittances*** | | | 2.4247 (0.119) |
| Do not Receive Remittance | 37.28 | 43.16 | |
| Receive Remittances | 62.72 | 56.84 | |

Note: ** indicate 5 percent significance level; [C] indicates that the addition for each variable is by columns; [I]indicates T-test instead of Chi-square.

Source: Author's computation based on the 2010 FINSCOPE Data of Ghana.

### 6.4.3. The Estimation Techniques

This study seeks to determine whether access to microcredit without microinsurance might increase household welfare. The sample population is divided into three: (1) households using microcredit, but not microinsurance; (2) households using microcredit and microinsurance; and (3)

[45] The chi-square and the t-test were used for the categorical and continuous variables respectively.

households without microcredit or microinsurance. The microfinance programs under this study were not assigned randomly, hence the estimation technique is confined to a sample population in which all households have access to microfinance services (microcredit and microinsurance), but some decided not to take up these financial products. The non-randomization of the products creates selection bias and endogeneity problems associated with the uptake of microfinance programs. Hence the estimation is done to account for selection bias and endogeneity problems by using the following techniques: Heckman sample selection method, treatment effect model and instrumental variable modelling.

#### *6.4.3.1. The Heckman Sample Selection Model*

Heckman's (1974, 1978 and 1979) model for sample selection is a two-step technique for evaluating nonrandomized programs. It is used to correct selection bias. The first step involves the estimation of a probit function on the determinants of the uptake of microcredit[46]. The probit model for microcredit is a binary variable which takes the value of one (1) if household *i* has taken up microcredit otherwise zero (0). This is given in the following set up as:

$$CREDIT_i = \begin{cases} 1 \; if \; household \; i \; has \; microcredit \\ 0 \; if \; household \; i \; never \; had \; microcredit \end{cases} \quad 6.1$$

The above set up is given as:

$$CREDIT_i = z_i\delta + \mu_i \quad 6.2$$

Thus $Prob(CREDIT_i = 1|z_i) = \Phi(z_i\delta)$ and $Prob(CREDIT_i = 0|z_i) = 1 - \Phi(z_i\delta)$

Where $\boldsymbol{z_i}$ is a vector of exogenous variables determining treatment (the uptake of microcredit) and $\boldsymbol{\Phi(\cdot)}$ is the standard normal cumulative distribution function. The parameters of the probit function are then used to calculate the inverse Mills ratio (hazard lambda) which is then included in the outcome equation as an additional independent variable (Janzen and Carter, 2013; Lin, 2007). The inverse Mills ratio accounts for possible selection bias and omitted variables or the unexplained variations in the error term, and is given as:

$$\lambda_i = \frac{\phi(z_i\hat{\delta})}{\Phi(z_i\hat{\delta})} \quad 6.3$$

Where $\boldsymbol{\lambda_i}$ is the inverse Mills ratio, $\boldsymbol{\phi}$ is standard normal density function, and $\boldsymbol{\Phi}$ is as defined in the probit model above. The second step equation (that is, the effect of microcredit on household welfare) is then estimated with the inverse Mills ratio as an additional independent variable.

$$WELF_i = \beta_0 + \beta_1 CREDIT_i + \beta_2\lambda_i + control_i + \varepsilon_i \quad 6.4$$

[46] The estimations of the microinsurance model follow the same procedure.

Where $WELF_i$ is the household welfare indicator; $CREDIT_i$ is the uptake of microcredit; $control_i$is a vector of control variables such as education, age, marital status, rural-urban setting, income and economic activity; and the error terms ($\mu_i$; $\varepsilon_i$) of equations (6.2) and (6.4) are both bivariate normal with mean zero.

#### *6.4.3.2. The Treatment Effect Model*

The treatment effect model performs the estimation for both the program participants and non-participants simultaneously. The selection and outcome equations are indicated in (6.5) and (6.6) respectively.

$CREDIT_i = 1\ if\ CREDIT_i^* > 0, and\ CREDIT_i = 0\ otherwise$

Thus $CREDIT_i^* = z_i\delta + \mu_i,$ 6.5

$WELF_i = x_i\beta + CREDIT_i\gamma + \varepsilon_i$ 6.6

Where $\boldsymbol{\mu_i}$ and $\boldsymbol{\varepsilon_i}$ are the error terms which are bivariate normal with zero mean. Since $CREDIT_i$ is an endogenous binary variable, the treatment effect model uses the observed characteristics of the participants and the non-participants for the estimation of the parameters of $\boldsymbol{\beta}$ and also control for selection bias due to non-ignorable placement of microfinance. Substituting equation (6.5) into equation (6.6) gives the outcomes models for both the participants and the non-participants.

When $CREDIT_i^* > 0, CREDIT_i = 1: WELF_i = x_i\beta + (z_i\delta + \mu_i)\gamma + \varepsilon_i$ 6.7

And when $CREDIT_i^* \leq 0, CREDIT_i = 0: WELF_i = x_i\beta + \varepsilon_i$ 6.8

Where the $WELF_i = x_i\beta + (z_i\delta + \mu_i)\gamma + \varepsilon_i$ is the participants outcome model while the non-participants outcome model is $WELF_i = x_i\beta + \varepsilon_i$**.** These two models are estimated simultaneously.

#### *6.4.3.3. Instrumental Variable Model (IV Model)*

An instrumental variable model is included in this study to help us capture certain unobserved features such as entrepreneur passion, fear or motivation which are likely not to be captured by either the Heckman or treatment effect models. It controls for the endogeneity problems associated with the uptake of microfinance products, and also serves as a check on the robustness of the results. In order to resolve the problem of endogeneity bias, the IV model requires an observed variable that is (1) strongly correlated with the demand for microcredit; but (2) uncorrelated with the error term. We chose customers' identity card, bank account and proximity to a financial company. Following the theoretical exposition of Wooldridge (2002) about IV's two-stage least squares, we employed these instruments to estimate the influence of microcredit on household welfare.

### 6.4.4. The Construction of the Asset Index

The ownership of assets such as radio, television, mobile phone, refrigerator, electricity, toilet, and piped water, as well as the type of materials used for the floor and roofing of a house can enhance the well-being of household members. For instance whereas piped water, flush toilet and a cement floor may improve household welfare, drinking from surface water (stream, lake, river), using a pit latrine or defecating in the bush or open field, and using clay to floor a house may expose the household to deadly diseases such as cholera, guinea worm, bilharzia and snake bites. This compromises the health status of households, reduces their productive hours, increases their hospital bills and lowers their well-being. Hence the level of households' wealth or accumulated assets has been used as the measure of welfare in this study. We created an asset index as a composite welfare indicator through multiple correspondence analysis.

Asset index has been used in the mainstream poverty literature to measure poverty levels (see e.g. Booysen *et al.,* 2008; Harttgen *et al.,* 2013; Filmer & Scott, 2012; Echevin, 2011; Sahn & Stifel, 2000; Njong & Ningaye, 2008). This study adds a new innovation to its usage by employing it in the financial literature to measure household welfare. We used twelve private household assets and access to water and electricity for the creation of the asset index. The index, $WELF_i$, is a function of specific underlying variables $P_{ij}$, such that $P_{ij}$ represents household *i's* ownership or lack of asset/property ***j*** (Johnston and Abreu, 2013; Booysen *et al.,* 2008).

$$WELF_i = f\{P_{ij}\} \quad 6.9$$

This is expanded as: $WELF_i = P_{i1} + P_{i2} + \ldots + P_{im}$ 6.10

Where $P_{ij}$ is a binary or categorical variable and takes the value 1 if household ***i*** owns asset ***j***, and 0 if otherwise. Following the methods of Benżecri (1973), Asselin (2009), Booysen *et al.* (2008), Echevin (2011) and van Kerm (1998) the weights of the individual assets were then computed using multiple correspondence analysis. The basic form of the asset index is given as:

$$a_i = \sum_{k=1}^{k} F_{1k}\, d_{ki} \quad 6.11$$

The *i*th household asset index is $\alpha_i$, $d_{ki}$ is the *k*th value of the categorical variables (with k=1… K) indicating the households' assets included in the index construction. $F_{1k}$ is the MCA weights generated for the analysis. The extended form of the asset index for this study is given as:

$$WELF_i = P_{i1}W_1 + P_{i2}W_2 + \cdots P_{ij}W_j \quad 6.12$$

Where $WELF_i$ is the welfare composite index of household ***i,*** the response of household ***i*** to category/asset *j* is represented by $P_{ij}$ and $W_j$ is the MCA weight for dimension one applied to category ***j*** (Booysen *et al.,* 2008).

## 6.5. RESULTS AND DISCUSSION

### 6.5.1. Uses of the Microcredit

It is expected that borrowing to finance productive ventures will grow household income and enhance their wealth. Also, borrowing to invest in household members' education propels their human capital development which can have long-term effects on sustainable poverty alleviation. The descriptive statistics in Table 6.3 indicates that about 53 percent of the microcredit is channelled into productive economic activities and human capital investment. Whereas this may indicate proper utilization of microcredit, the 30.27 percent and 5.4 percent spent on consumption and servicing of old debts may not grow the assets of households in the long run. The over-reliance on debt to finance consumption expenditure can tie households up into the negative effects of credit cycles.

**Table 6.3: Uses of the Microcredit**

| Purpose | Frequency | Total | Percentage (%) |
|---|---|---|---|
| ***Consumption Expenditure*** | | 89 | 30.27% |
| 1. Daily expenses | 39 | | |
| 2. Emergency | 24 | | |
| 3. Social (wedding) | 8 | | |
| 4. Rent | 5 | | |
| 5. Motorcycle/car | 6 | | |
| 6. Household assets | 7 | | |
| ***Housing Expenditure*** | | 34 | 11.57% |
| 1. Purchase land | 5 | | |
| 2. Build a house | 14 | | |
| 3. House renovation | 15 | | |
| ***Business Expenditure*** | | 107 | 36.40% |
| 1. Start-up capital | 20 | | |
| 2. Agric inputs | 29 | | |
| 3. Business expansion | 58 | | |
| ***Human Capital*** | | 48 | 16.32% |
| Education | 48 | | |
| ***Others*** | | 16 | 5.44% |
| 1. Pay old debts | 13 | | |
| 2. Other investment | 3 | | |
| **Total** | | **294** | **100%** |

Source: Authors' computation based on the 2010 FINSCOPE Data of Ghana.

The empirical estimations cover households using (1) only microcredit, (2) only microinsurance and (3) those using both microcredit and microinsurance. The results have been reported in Table 6.5. The results of the probit model to obtain the coefficients for the inverse Mills ratio needed for the correction of selection bias is reported in Table 6.4. The characteristics of households (except income) have no significant effect on the uptake of microcredit, rather some institutional factors and the availability of microcredit substitutes seem to influence the demand for microcredit. For instance financial deepening, measured by the percentage of the population banked, has a very strong positive effect on the uptake of microcredit. This lends support to the finance literature (e.g. see King & Levine, 1993; Knoop, 2013) that financial development facilitates increased credit access to households and economic entities.

The other significant institutional factors are convenience of banking hours, customers' identification card, remittances and savings. The results reveal that customers' identification card is the only valid instrument for the estimation of the IV model, hence proximity to a financial institution and bank account were dropped from the estimation of the IV model. As predicted by financial theory, access to substitutes such as borrowing from family and friends as well as trade credit have significant negative effects on the demand for microcredit.

**Table 6.4: The Probit Model Result for Microcredit**

| Microcredit | Coefficient | Std. Error | P-Value |
|---|---|---|---|
| ***HH Characteristics*** | | | |
| Marital | 0.0681 | 0.1332 | 0.609 |
| Total_HH Size | 0.0449 | 0.0300 | 0.134 |
| HH Size_15yrs | -0.0123 | 0.0527 | 0.815 |
| Education | -0.0439 | 0.0340 | 0.197 |
| Age | 0.0176 | 0.0240 | 0.464 |
| Age Square | -0.0002 | 0.0002 | 0.365 |
| Gender | -0.0534 | 0.1273 | 0.675 |
| Farming | -0.0533 | 0.1456 | 0.714 |
| Receive No Income | -0.3056 | 0.1732 | 0.078* |
| Rural | -0.2186 | 0.1425 | 0.125 |
| ***Interactions with Financial Institutions*** | | | |
| Require_Fin_Inst | -0.0063 | 0.0135 | 0.636 |
| Proxim._Fin_Inst. | -0.0039 | 0.0065 | 0.550 |
| Trust_Fin_Inst | -0.0201 | 0.0224 | 0.369 |
| Banking Hours | 0.0660 | 0.0214 | 0.002*** |
| Bank Account | 0.3742 | 0.2661 | 0.160 |
| Identity Card | 0.6166 | 0.1903 | 0.001*** |
| Savings | 0.8239 | 0.4684 | 0.079* |
| Remittance | 0.3049 | 0.1315 | 0.020** |
| Population Banked | 0.5581 | 0.1985 | 0.005*** |
| ***Microcredit Substitutes*** | | | |
| Tradecredit | -2.2258 | 0.4733 | 0.000*** |
| Borrow_Family_Friends | -1.2082 | 0.1112 | 0.000*** |
| Borrow_Employer | -0.0631 | 0.1664 | 0.705 |
| Constant | 7.7928 | 1.9683 | 0.000*** |
| *Observations* | *638* | | |
| *Prob >Chi2* | *0.000* | *Pseudo R-Square = 0.34* | |

Note: ***, ** and * represent 1, 5 and 10 significance levels respectively.
Source: Authors' computation based on 2010 Finscope data of Ghana.

The empirical estimation shows that selection bias as captured by the inverse Mills ratio is insignificant, thus our sample is not biased. The Heckman and treatment effect models indicate that microcredit has no significant influence on households' asset accumulation. Although its effect under the IV is positive, a comparison of its significance level with that of the combined products under the same IV indicates a weak percentage of 5 as against 1 percent for the combined products. Together the results show that households using only microcredit do not derive much benefit from microcredit in terms of asset build-up. This result seems to confirm the fears of Bateman (2010) and the empirical findings of Coleman (1999), Morduch (1998), and Adams and Von Pischke (1992).

Nevertheless, households using both microcredit and microinsurance derive positive and significant benefits from both products in terms of asset accumulation. The positive and significant benefits that households derived by combining microcredit and microinsurance may be attributed to two reasons: (1) the insurance indemnity and (2) utilization of the credit for the intended

purpose. Microinsurance[47] being a risk management tool, indemnifies policyholders against certain risks at a fee over a period of time. For instance, credit life protects households against the liquidation of assets to repay loans; health insurance prevents the tendency of diverting approved loans to pay for hospital bills; and property insurance (e.g. fire policy) enables households to avoid the tendency of falling on approved loans to rebuild after a fire.

The opportunity cost of poor health and economic shocks are quite unbearable for the poor (Chakrabarty, 2012), thus in the absence of insurance, either microcredit or mostly assets are depleted to cope with risky event (Smith, 1998). Hence advancing microcredit to the poor may not lead to build-up of more assets unless it is combined with an appropriate microinsurance product. The use of microinsurance enables households to avoid the misapplication of microcredit funds, and complements microcredit by equipping households to avoid moral hazards in the utilization of microcredit funds. This finding lends support to similar findings by Chakrabarty (2012) which indicate that the strength of microcredit to reduce child labour among the extremely poor is realized through combination with an appropriate microinsurance policy.

[47] The microinsurance products covered in this study are life, property, health, funeral, education and investment plans.

**Table 6.5: The Estimations of Microcredit and Microinsurance**[48]

| Variables | Microinsurance Only | | | Microcredit Only | | | Microcredit and Microinsurance Together | | |
|---|---|---|---|---|---|---|---|---|---|
| | ***Heckman*** | ***Treatment*** | ***IV*** | ***Heckman*** | ***Treatment*** | ***IV*** | ***Heckman*** | ***Treatment*** | ***IV*** |
| Microinsurance | 0.0710 | 0.1842 | 0.1909 | | | | | | |
| | (0.339) | (0.048)** | (0.050)** | | | | | | |
| Microcredit | | | | 0.0026 | 0.0182 | 0.9779 | | | |
| | | | | (0.969) | (0.850) | (0.022)** | | | |
| Insure_Credit | | | | | | | 0.1523 | 0.3175 | 0.5085 |
| | | | | | | | (0.041)** | (0.014)** | (0.006)*** |
| Inv.Mills Ratio | -0.0589 | -0.0619 | | -0.0389 | -0.0037 | | -0.0125 | -0.1295 | |
| | (0.333) | (0.350) | | (0.509) | (0.956) | | (0.811) | (0.135) | |
| Not Married | -0.0938 | -0.0981 | -0.0936 | -0.0607 | -0.0651 | -0.0852 | -0.1020 | -0.1038 | -0.1075 |
| | (0.117) | (0.097)* | (0.119) | (0.023)* | (0.004)*** | (0.003)*** | (0.099)* | (0.090)* | (0.078)* |
| Education | 0.1772 | 0.1775 | 0.1770 | 0.1822 | 0.1835 | 0.1769 | 0.1815 | 0.1771 | 0.1716 |
| | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** |
| T_HH_Size | -0.0605 | -0.0610 | -0.0615 | -0.0575 | -0.0590 | -0.0662 | -0.0602 | -0.0629 | -0.0668 |
| | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)** |
| HH Size≥15yrs | 0.0706 | 0.0731 | 0.0712 | 0.0647 | 0.0679 | 0.0663 | 0.0691 | 0.0703 | 0.0753 |
| | (0.005)*** | (0.003)*** | (0.004)*** | (0.011)** | (0.006)*** | (0.027)** | (0.007)*** | (0.005)*** | (0.003)*** |
| Resp.Age | -0.0077 | -0.0078 | -0.0073 | -0.0049 | -0.0033 | -0.0193 | -0.0071 | -0.0076 | -0.0100 |
| | (0.490) | (0.479) | (0.511) | (0.657) | (0.757) | (0.180) | (0.537) | (0.502) | (0.380) |
| Resp.Age Sq | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0002 | 0.0000 | 0.0000 | 0.0001 |
| | (0.442) | (0.427) | (0.461) | (0.463) | (0.532) | (0.110) | (0.466) | (0.448) | (0.354) |
| Gender | 0.0788 | 0.0744 | 0.0776 | 0.1194 | 0.1116 | 0.1770 | 0.0879 | 0.0778 | 0.0620 |
| | (0.164) | (0.187) | (0.171) | (0.046)** | (0.051)* | (0.017)** | (0.135) | (0.181) | (0.286) |
| Income | 0.0670 | 0.0730 | 0.0742 | 0.0698 | 0.0512 | 0.1683 | 0.0800 | 0.0950 | 0.1123 |
| | (0.394) | (0.350) | (0.348) | (0.390) | (0.515) | (0.114) | (0.325) | (0.240) | (0.173) |
| Tradecredit | 0.1907 | 0.1917 | 0.1954 | 0.2142 | 0.1960 | 0.5105 | 0.2148 | 0.2295 | 0.2488 |
| | (0.006)*** | (0.000)*** | (0.005)*** | (0.005)*** | (0.010)** | (0.002)*** | (0.005)*** | (0.002)*** | (0.001)*** |
| Rura | -0.7697 | -0.7719 | -0.7695 | -0.7546 | -0.7706 | -0.6766 | -0.7639 | -0.7676 | -0.7632 |
| | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** |
| Non-Farming | 0.4313 | 0.4331 | 0.4320 | 0.4266 | 0.4350 | 0.4589 | 0.4167 | 0.4151 | 0.4255 |
| | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** |
| Constant | 1.1197 | 1.0066 | 1.3421 | 0.9653 | 0.9544 | -0.1512 | 0.8203 | 0.6864 | 1.0102 |
| | (0.002)*** | (0.004)*** | (0.002)*** | (0.007)*** | (0.008)*** | (0.848) | (0.035)** | (0.083)* | (0.028)** |
| *Observations* | 667 | 667 | 667 | 638 | 663 | 671 | 638 | *638* | *667* |
| *Adj.R.sq.* | *0.51* | *Wald=724.25* | *Adj.R.sq=0.51* | *Adj.R.sq=0.51* | *Wald=761.35* | *Adj.R.sq=0.30* | *Adj.R.sq=0.51* | *Wald=686.50* | *Adj.R.sq.= 0.49* |
| *Prob>F* | *0.000* | *P>Chi2=0.000* | *P>F=0.000* | *P>F=0.000* | *P>Chi2=0.000* | *P>F=0.000* | *P>F=0.000* | *P>Chi2=0..000* | *P>F=0.000* |

Note: The P-values are in parenthesis. ***, ** and * indicate 1%, 5% and 10% significance levels respectively.

[48] In order to ensure consistency of results and heteroskedastic consistent estimates, robust standard errors have been performed on the variables. The results of the robust standard errors do not statistically differ from what is reported here. See Table C.1 in Appendix C for the results of the robust standard errors.

## 6.6. CONCLUSION AND IMPLICATIONS

The study has assessed the welfare enhancing ability of microcredit with or without microinsurance. In particular we asked: does microcredit increase households' welfare in the absence of microinsurance? The empirical analyses under Heckman, treatment effect and IV models indicate a weak association between microcredit and household welfare. However it improves households' well-being if combined with microinsurance.

Microcredit may be good, but its real benefits to the poor are best realized if the poverty trapping risks such as poor health, fire, flood, drought and income shocks which are major obstacles to the breaking of the poverty cycle are managed with appropriate microinsurance schemes. This finding underscores the need to advance microcredit and microinsurance to the poor as a single package instead of separate products. To the extent that microfinance is inextricably linked to households' welfare, combining microcredit and microinsurance will equip the poor to achieve steady asset accumulation and make sustainable exit from poverty.

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# CHAPTER 7
# THE CONCLUSION AND POLICY RECOMMENDATIONS

## 7.1. INTRODUCTION

This research is a collection of essays which have examined the welfare benefits of microinsurance from the perspective of Ghana. Specifically the research sought to evaluate the impact of microinsurance on household asset accumulation, and tested whether microinsurance is a viable alternative for coping with risk and for smoothing consumption. The thesis also examined the asset inequality levels of insured and uninsured households and then tested whether microinsurance has any effect on the levels of inequality. Finally it tested whether households gain positive synergy by combining microinsurance and microcredit.

Using data on household living standards from the 2010 FINSCOPE survey, the impact evaluation was undertaken through Heckman sample selection, treatment effects model and instrumental variable modelling. Each of these methods provides a unique benefit to the whole impact estimations. For instance, both the Heckman and treatment models control for selection bias, however whereas the Heckman model uses the observed variables of only the insured to undertake the estimations, the treatment effect model uses the observed variables of both insured and uninsured households. The instrumental variable model controls for endogeneity bias by using the unobserved characteristics of both the insured and the uninsured for the empirical estimations. Together the three models provide results which are consistent and reliable.

On the whole the study makes a unique contribution to the literature in three main ways. First, income has been used quite extensively in welfare economics to measure the level of wealth and welfare. However, incomes, particularly of informal sector workers, are known to be seasonal and suffer from mis-measurement and recall bias (Moser & Felton, 2007; McKenzie, 2004). The accuracy of household income is also hindered by households' reluctance to divulge sensitive information concerning their income and expenditure levels. In order to overcome these challenges associated with income and expenditure data, this study used an asset index created through multiple correspondence analyses to measure the welfare levels of low-income households. Although asset indexes have been used in the mainstream welfare economics, this study is one of the pioneers in the application of the concept in the microinsurance field.

Second, the study initiates a new dimension to the debate and controversies in the microfinance literature by asking whether households using microcredit in combination with microinsurance derive more significant welfare benefits than those using only microcredit schemes. Third, microinsurance schemes have been on the Ghanaian market for more than a decade, however

there has not been any empirical investigation into their impact on household welfare. This research thus addresses this urgent need by providing valuable empirical knowledge needed not only for the growth and development of the sector, but most importantly for improving the welfare of low-income households. The information is also very timely and an important input to the National Insurance Commission's intention to amend the policy guidelines on microinsurance in order to make it more relevant to the conditions of low-income households.

## 7.2. SUMMARY OF THE FINDINGS

The impact of microinsurance on asset accumulation presented in Table 3.8 indicates that insured households derived positive significant gains from microinsurance through the protection of their assets against risks. The indemnity cover under microinsurance empowers low-income households to engage in high risk high yielding ventures necessary for the accumulation of essential assets. More importantly, the results indicate that the pay-out received if an insurable risk occurs prevents asset pawning. This implies that microinsurance protects households against asset liquidation during times of emergency.

The empirical evidence presented in Table 4.3 also reveals that households undertake better consumption smoothing through the use of microinsurance schemes. Specifically, insured households are on average 19-22 percent less likely to forgo daily meals when faced with an income shock. Sacrificing the quality and quantity of food can have pernicious and irreversible consequences on the health of household members, especially children. To the extent that microinsurance eliminates the tendency to cut meals, it promotes healthy living necessary for household development.

With respect to the level of asset inequality within and between the insured and the uninsured households, the analysis under the Gini index shows that insured households have lower levels of asset inequality. More importantly, insured female-headed households have lower inequality than insured male-headed households. But uninsured female-headed households are worse off than both uninsured and insured male-headed households. The geographical dimension shows that insured rural dwellers have lower asset inequality than the rural uninsured. However, the analyses of Northern and Brong Ahafo regions reveal that large developmental gaps may limit the effect of microinsurance in closing the asset inequality gap.

Finally, the study examined the scenarios where some households use only microcredit while others use microcredit in combination with microinsurance. The findings suggest a weak influence of microcredit on household welfare. However households using microcredit in combination with microinsurance derive significant gains in terms of welfare improvement. Microcredit may be good,

but its real benefits to the poor are best realised if the poverty trapping risks are covered with microinsurance.

In all the findings of the four empirical papers corroborate each other by confirming the theoretical underpinnings that indeed microinsurance improves the welfare of low-income households.

## 7.3. CONCLUSION

The combined evidence reveals quite strongly that microinsurance is a very good risk management instrument for improving the welfare of low-income households through asset retention, proper consumption smoothing, reduction in asset inequality and the derivation of positive synergies from microcredit.

## 7.4. RECOMMENDATIONS

The thesis recommends some policy interventions necessary for welfare enhancement through microinsurance schemes. The welfare benefits of microinsurance can be widened to cover more low-income households if the barriers to the uptake of microinsurance are eliminated. Barriers such as lack of substantive legislative backing need to be addressed expeditiously to encourage more insurance firms to enter the microinsurance sector. Of the 44 life and non-life insurance companies in Ghana only 11 are providing microinsurance schemes to the informal sector. Addressing the regulation obstacles may incentivize many more insurers to enter this largely untapped segment of the insurance industry.

There is also a need to upscale microinsurance to enable low-income households to participate and benefit to a larger extent. The key issue is to ensure a design that reduces transaction costs and makes it relatively less expensive to enhance significant participation. Achieving depth and large scale extension in a cost effective manner can be done through the use of mobile phone technology. The concept of mobile banking has proven to be cost effective in extending banking services to millions of poor households who were previously excluded from formal banking at a low transaction cost. “Mobile microinsurance” can be designed along the lines of the mobile banking concept to meet the specific needs of microinsurance transactions at a lower cost, and also result in a lower cost of premium and greater accessibility and depth. Already two mobile companies have started bundling microinsurance with their services. A formal public policy and regulatory backing by the NIC and key stakeholders such as the National Communication Authority will increase the confidence of the public in “mobile microinsurance” and possibly encourage other entities to venture into it. This will not only increase the uptake of microinsurance, but it will also equip low-income households to protect their assets against risk, escape consumption poverty and gradually bridge the asset inequality gap.

The upscaling of microinsurance amongst low-income households can also be enhanced by increasing the density and spread of microinsurance providers. The NIC can encourage more insurers to enter the microinsurance market by setting a different initial regulatory capital for microinsurance providers. Currently the regulatory capital is set at US$5 million for every insurance company irrespective of class of business or size. Requiring all insurers, either life, non-life or microinsurance providers, to start with the same capital may discourage some insurers from entering the microinsurance sector and will also not help in increasing the scale of uptake from low income households. Therefore to encourage more insurers to enter the microinsurance sector, the NIC can use its regulatory powers to lower the regulatory capital for prospective microinsurers. This will reduce the entry cost of microinsurance and increase the number of providers who can provide these services at a lower premium and thereby attract more low income households. The regulatory capital incentive can also be structured to be more favourable to institutions willing to locate in rural and semi-urban areas with high densities of low-income households. Such incentives can encourage significant entry into the industry and also help spread the provision of microinsurance at a relatively lower setup cost to low-income households and result in higher uptake.

In addition microinsurance can be a better enabler for reduction in asset inequality if institutional and developmental gaps are dealt with. Institutional and developmental deficits, such as inadequate hospitals and insurance companies in Brong Ahafo and the three Northern regions have reduced the influence of microinsurance, especially the national health insurance scheme, on asset inequality. It is therefore imperative for the government to initiate policies that will bridge the developmental gaps and increase the access of microinsurance services in these regions.

Microfinance providers can add more to clients' value if they exploit the positive synergies between microcredit and microinsurance by designing products which tie the two products into a single scheme. This requires going beyond the usual credit life products into products that provide credit as well as cover health, fire, drought, theft and disability. To the extent that microfinance is inextricably linked to households' welfare, combining microcredit and microinsurance will equip the poor to achieve steady asset accumulation and make a sustainable exit from poverty.

Sometimes welfare intervention programs suffer major setbacks when the recipients encounter risky events such as crop failure, fires and other shocks. These uninsured shocks can draw the recipients who may otherwise be above the poverty line back into poverty, thereby erasing any meaningful gains made under the welfare intervention. It is therefore essential that the beneficiaries of welfare programs are properly insured against the very risk that impoverishes them. This demands a policy that will integrate microinsurance into the government's strategy on poverty reduction. Integrating microinsurance into the government poverty reduction strategy will

promote a sustainable reduction in poverty and facilitate a systematic empowerment of low-income households to achieve welfare improvements.

Future studies may consider using panel data (where such data is available) to analyse the dynamic influence of microinsurance on household welfare. The availability of panel data may also allow the application of other impact methods such as difference-in-difference to estimate the before and after effects of microinsurance on household welfare.

# APPENDIX A:
# ROBUST STANDARD ERRORS: ASSET ACCUMULATION

**Table A.1: Heteroskedasticity Robust Standard Errors: Asset Accumulation**

| Variables | Heckman | IV |
|---|---|---|
| Microinsurance | 0.0712 | 0.1899 |
| | (0.355) | (0.053)** |
| Microcredit | -0.0035 | -0.0081 |
| | (0.950) | (0.886) |
| Inv.Mills ratio | -0.0589 | |
| | | (0.331) |
| Not Married | -0.0938 | -0.0935 |
| | (0.112) | (0.114) |
| Education | 0.1772 | 0.1771 |
| | (0.000)*** | (0.000)*** |
| T_HH_Size | -0.0605 | -0.0614 |
| | (0.000)*** | (0.000)*** |
| HH Size≥15 | 0.0706 | 0.0712 |
| | (0.006)*** | (0.005)*** |
| Resp.Age | -0.0076 | -0.0072 |
| | (0.502) | (0.526) |
| Resp.Age Sq | 0.0001 | 0.0001 |
| | (0.457) | (0.478) |
| Male | 0.0786 | 0.0771 |
| | (0.162) | (0.172) |
| Income | 0.0666 | 0.0732 |
| | (0.422) | (0.374) |
| Tradecredit | 0.1895 | 0.1927 |
| | (0.004)*** | (0.004)*** |
| Rural | -0.7700 | -0.7703 |
| | (0.000)*** | (0.000)*** |
| Non-Farming | 0.4312 | 0.4318 |
| | (0.000)*** | (0.000)*** |
| *Constant* | 1.1240 | 1.3546 |
| | (0.002)*** | (0.001)*** |
| *Observations* | *667* | *667* |
| *Adj. R-Squ.* | *0.52* | *0.52* |
| *P>F* | *0.000* | *P>F=0.000* |

Note: ***, ** and * indicate 1%, 5% and 10% significance levels respectively.

Source: Author's computation based on the 2010 Finscope data of Ghana.

# APPENDIX B:
# SELECTION BIAS TEST

**Table B.1: The Selection Bias Test, Heckman Model**

| Asset Index | Coeff | Std. Error | P-Value |
|---|---|---|---|
| Microinsurance | 0.0712 | 0.0743 | 0.338 |
| Inverse Mills Ratio | -0.0589 | 0.0609 | 0.333 |
| Microcredit | -0.0035 | 0.0572 | 0.951 |
| Not Married | -0.0938 | 0.0598 | 0.118 |
| Male | 0.0786 | 0.0567 | 0.166 |
| Resp. Education Level | 0.1772 | 0.0145 | 0.000*** |
| Resp. Age | -0.0076 | 0.0112 | 0.495 |
| Resp. Age Square | 0.0001 | 0.0001 | 0.446 |
| Total HH Size | -0.0605 | 0.0148 | 0.000*** |
| HH Size ≥ 15 Yrs | 0.0706 | 0.0249 | 0.005*** |
| Income | 0.0666 | 0.0788 | 0.166 |
| Trade Credit | 0.1895 | 0.0720 | 0.009*** |
| Non-Farming | 0.4313 | 0.0665 | 0.000*** |
| Rural | -0.7700 | 0.0643 | 0.000*** |
| Constant | 1.1240 | 0.3728 | 0.003*** |
| Observations | 676 | | |
| Adj. R-Square | 0.51 | Prob >F = 0.000 | |

***, ** and * represent 1, 5 and 10 significance levels respectively.

Source: Author's computation based on 2010 Finscope data of Ghana.

# APPENDIX C:

# ROBUST STANDARD ERRORS: MICROCREDIT AND MICROINSURANCE

**Table C.1: Heteroskedasticity Robust Standard Errors: Microcredit and Microinsurance**

| Variables | Microinsurance Only | | Microcredit Only | | Microcredit and Microinsurance Together | |
|---|---|---|---|---|---|---|
| | *Heckman* | *IV* | *Heckman* | *IV* | *Heckman* | *IV* |
| Microinsure Only | 0.0710 | 0.1909 | | | | |
| | (0.354) | (0.050)** | | | | |
| Microcredit Only | | | 0.0026 | 0.9779 | | |
| | | | (0.968) | (0.020)** | | |
| Insure_Credit | | | | | 0.1523 | 0.5085 |
| | | | | | (0.037)** | (0.006)*** |
| Inv.Mills Ratio | -0.0589 | | -0.0389 | | -0.0125 | |
| | (0.331) | | (0.442) | | (0.776) | |
| Not Married | -0.0938 | -0.0936 | -0.0607 | -0.0852 | -0.1020 | -0.1075 |
| | (0.112) | (0.114 | (0.020)** | (0.005)*** | (0.093)* | (0.074)* |
| Education | 0.1772 | 0.1770 | 0.1822 | 0.1769 | 0.1815 | 0.1716 |
| | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** |
| T_HH_Size | -0.0605 | -0.0615 | -0.0575 | -0.0662 | -0.0602 | -0.0668 |
| | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** |
| HH Size≥15yrs | 0.0706 | 0.0712 | 0.0647 | 0.0663 | 0.0691 | 0.0753 |
| | (0.006)*** | (0.005)*** | (0.015)** | (0.027)** | (0.009)*** | (0.003)*** |
| Resp.Age | -0.0077 | -0.0073 | -0.0049 | -0.0193 | -0.0071 | -0.0100 |
| | (0.498) | (0.518) | (0.665) | (0.193) | (0.542) | (0.387) |
| Resp.Age Sq | 0.0001 | 0.0001 | 0.0001 | 0.0002 | 0.0000 | 0.0001 |
| | (0.453) | (0.471) | (0.472) | (0.115) | (0.474) | (0.365) |
| Gender | 0.0788 | 0.0776 | 0.1194 | 0.1770 | 0.0879 | 0.0620 |
| | (0.161) | (0.170) | (0.041)** | (0.014)** | (0.129) | (0.285) |
| Income | 0.0670 | 0.0742 | 0.0698 | 0.1683 | 0.0800 | 0.1123 |
| | (0.418) | (0.366) | (0.418) | (0.126) | (0.353) | (0.192) |
| Tradecredit | 0.1907 | 0.1954 | 0.2142 | 0.5105 | 0.2148 | 0.2488 |
| | (0.003)*** | (0.002)*** | (0.001)*** | (0.001)*** | (0.001)*** | (0.000)*** |
| Rural | -0.7697 | -0.7695 | -0.7546 | -0.6766 | -0.7639 | -0.7632 |
| | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** |
| Non-Farming | 0.4313 | 0.4320 | 0.4266 | 0.4589 | 0.4167 | 0.4255 |
| | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** |
| *Constant* | 1.1197 | 1.3421 | 0.9653 | -0.1512 | 0.8203 | 1.0102 |
| | (0.001)*** | (0.002)*** | (0.005)*** | (0.846) | (0.027)** | (0.026)** |
| *Observations* | 667 | 667 | 638 | 671 | 638 | *667* |
| *R.sq.* | *0.52* | *R.sq=0.52* | *R.sq=0.52* | *R.sq=0.31* | *R.sq=0.52* | *R.sq.= 0.50* |
| *Prob>F* | *0.000* | *P>F=0.000* | *P>F=0.000* | *P>F=0.000* | *P>F=0.000* | *P>F=0.000* |

The P-values are in parenthesis. ***, ** and * indicate 1%, 5% and 10% significance levels respectively.