THE IMPACT OF FINANCIAL INCLUSION ON FOOD SECURITY: A
COMPARATIVE APPROACH OF MALAWI AND ZIMBABWE

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I, Musapatika Cosmas hereby declare that this work entitled ‘The impact of financial inclusion on food security: a comparative approach of Malawi and Zimbabwe’ is my own independent work except where stated otherwise in acknowledgements or text, and has not been submitted in whole or part of an award to any other institution.

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This dissertation is dedicated to my loving, caring, hardworking wife Analisa and my lovely daughter Nokutenda Brenna who encouraged me to finish the dissertation during difficult times.
ABSTRACT

On the basis of FinSope 2014 Consumer survey data; this study does a comparative analysis of the impact of financial inclusion on food security between Malawi and Zimbabwe. The researcher’s outcome variable of interest is the household’s probability of experiencing food insecurity related to difficulties in access to food as explained by the state of financial inclusion. Furthermore the study assesses the determinants of financial inclusion. To cater for the self-selection bias associated with financial inclusion the study employs inverse probability weighting to identify the impact of financial inclusion on food security. The study offers three major findings. Firstly, the results show that financial inclusion is affected by background characteristics of the household of which household education is standout determinant. Secondly, financial inclusion increases food security. Finally, the results indicate that there is country heterogeneity in the impact of financial inclusion on food security. The last two findings indicate that whilst financial inclusion improves food security, there are decreasing returns to financial inclusion since Zimbabwe, which has higher rates of financial inclusion has comparatively lower returns to financial inclusion.

Keywords: Food security; financial inclusion
JEL classification: D14 G10 I31
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<tr>
<td>NGO</td>
<td>Non-Governmental Organisation</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
<tr>
<td>UNSGSA</td>
<td>United Nation Secretary General’s Special Advocate</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<td>UNCDF</td>
<td>United Nations Capital Development Fund</td>
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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Sustainable development goal number two targets a world that is free from hunger by 2030. 815 million are said to be hungry today and 2 billion are expected to be under nourished by 2050 (United Nations, 2012). At the same time, the proportion of the population that has experienced severe food insecurity because of their inability to access food has risen in the developing countries (Tijani, 2016). There is rapid degradation of resources that support life and rapid climate change which pose a riskier tomorrow (Milman, 2015). The root cause of food insecurity in developing countries is the inability of people to gain access to food due to poverty (Vivas, 2010). While the rest of the world has made significant progress towards poverty alleviation, Africa, in particular Sub-Saharan Africa continues to lag behind (Kuwonu, 2015). Interpolations show that there will be an increase in this calibre unless preventive measures are executed. Food security on the continent has worsened since 1970 and the proportion of the malnourished population has remained within the 33 to 35 percent range in Sub-Saharan Africa (Mwaniki, 2006). The prevalence of malnutrition within the continent varies by region. It is lowest in Northern Africa with 4 percent and highest in Central Africa with 40 percent (Mwaniki, 2006).

With this regard, a multi-sectorial approach has been advocated for in order to eradicate poverty and hunger. Interdependence between different sectors means that poor health, food insecurity and poverty cannot be tackled effectively by addressing one sector in isolation thus influencing sustainable and positive change means adopting a holistic, multi-sectorial approach to development (MDG Center, East and Southern Africa, 2007). Many development economists
came to a consensus that a healthy financial structure is a prerequisite for growth and equity in distribution. In developing nations especially Sub-Saharan Africa, though improved recently, there is still great financial exclusion (Papadavid, 2016). Financial exclusion is obtaining when the majority of the people have no access to financial sector’s products, services and systems either by government policies or lack of funds available to the poor (Barasa V.N and Lugo C, 2015).

Those most vulnerable to poverty live in rural areas and large households that are often headed by women; education is low and they are also most likely to live in countries with real growth rates of less than 5% (World Bank, 2000). Sub-Saharan Africa accounts for nearly one-fourth of the world's poor, where 19 of the 25 poorest countries in the world are found (Dixon et al. 2001).

According to Global Findex data of 2014, 62 percent of the world’s adult population had an account at a formal financial institution or had access to mobile money services in 2014. The data shows a gap between women and men with 58 percent and 65 percent respectively. The geographic regions with the lowest level of financial inclusion are the Middle East and North Africa, and Sub-Saharan Africa (14 percent and 34 percent respectively).

Exclusion from the formal financial system has increasingly been identified as one of the barriers to a world without poverty (Donovan, 2012). The exclusion of the poor from the formal financial system has led to the development of informal instruments which actually limit them from the capacity to save, repay debts and manage their risk (Donovan, 2012). On a macroeconomic level, these financial constraints on the poor can slow economic growth and exacerbate inequality (Demirguc-Kunt, Beck, and Honohan 2008). Extending financial services to the poor, expected to improve productivity by increasing the efficiency and
lowering the cost of transactions, improving security, generating new employment opportunities, and creating a platform on which other businesses can grow (Donovan, 2012).

Advancing inclusive access to and usage of affordable formal financial services within the context of robust consumer protection frameworks is a vital mechanism for achieving broader policy objectives, such as promoting financial health, economic empowerment, financial stability, and sustainable growth (Robin Lewis, 2016). Thus, ensuring that individuals are able to identify, access, and leverage financial tools that help them save for the future, protect themselves from economic shocks, support their entrepreneurial goals, and otherwise contribute to their well-being should be a key priority for public sector and non-government entities alike (Robin Lewis, 2016). Holding other things constant, financial inclusion can potentially help to wither the problem of food security.

1.2 Statement of the problem

Being financially excluded deprives the household of access to formal financial instruments and knowledge. This limits their economic potential. When the greater part of the community is financially included, they will have access to financial products and facilities that will improve their insulation against problems of poverty and hunger. Food insecurity will decline and the quality of life will improve as financial inclusion affords the household the wherewith to wither transitory shocks to food security. Households will borrow in times of lower than expected incomes and save during times of excess incomes using formal financial services. While evidence of this relationship has been established in many countries, no comparison has been done between Malawi and Zimbabwe to observe the nature of such relationship. This research paper probes into financial inclusion and food security relationship, by comparing Malawi and Zimbabwe.
1.3 Purpose of the study
   a) This is a quantitative study of the factors that affect financial inclusion
   b) This identifies explicitly the relationship between financial inclusion and food security.
   c) The study will take a comparative approach between Malawi and Zimbabwe using secondary data.
   d) This identifies financial inclusion as the independent variable and takes food security as the dependent variable to expose the impact of financial inclusion on food security.

1.4 Aim and objectives of the study
This research seeks to proffer whether financial inclusion has influence on food security in Malawi and Zimbabwe. A comparative approach is adopted. Determinants of financial inclusion are identified for both nations. An assessment is done to see whether there is heterogeneity in the impact of financial inclusion on food security in Malawi and Zimbabwe or not.

The objectives of the study are to:

1. Find the determinants of financial inclusion in Malawi and Zimbabwe.
2. Establish whether financial inclusion affect food security in Malawi and Zimbabwe.
3. Find out whether there is heterogeneity in the impact of financial inclusion on food security between Malawi and Zimbabwe or not.

1.5 Research questions

1. What determines financial inclusion between Malawi and Zimbabwe?
2. Does financial inclusion affect food security in Malawi and Zimbabwe?
3. Is there heterogeneity in the impact of financial inclusion on food security between Malawi and Zimbabwe?
1.6 Hypotheses

Several papers highlight that financial inclusion depends on access. In as much as financial inclusion affect the quality of life, questions arose that requires answers. However the extent to which financial inclusion affects food security is itself an area to be interrogated by this hypothetical framework section. In responding to the factors that affect food security there are some generally acceptable views which needs to be tested. The following hypothesis provides alternatives answers to the questions highlighted earlier in this paper.

Clamara et al (2014) postulated that the bibliography of households affect their financial inclusion status. This includes their gender, educational background and the production sectors to which they are engaged. Therefore, a hypothesis linking background characteristics and financial inclusion status is proposed.

H1₀: Background characteristics of the household affect financial inclusion

H1₁: Background characteristics of the household do not affect financial inclusion

Studies have also noted financial inclusion affects both firm level and household level outcomes (Chauvet, 2015, Chauvet 2017, Karpowicz, 2014, Owen, 2018 ). Specifically Cull (2014) finds that financial inclusion at the household level allows the household to wither both systematic and idiosyncratic shocks to the food security status of the household. The following hypothesis linking financial inclusion and food security of the household is therefore proposed.

H2₀: Financial inclusion affects food security

H2₁: Financial inclusion does not affect food security

The marginal impact of financial inclusion is likely to be related to the level of financial inclusion that the country has attained. There is likely to be diminishing returns to financial inclusion. Chauvet (2015) noted that, groups of households that have higher levels of financial inclusion
inclusion had lower marginal returns to financial inclusion. The following hypothesis on the heterogeneity to the returns of financial inclusion is therefore proposed:

H30: There is heterogeneity in the impact of financial inclusion on Food security between Malawi and Zimbabwe.

H31: There is homogeneity in the impact of financial inclusion on food security between Malawi and Zimbabwe.

1.7 Research assumptions

Leedy and Ormrod (2010) posited that assumptions are so basic that without them, the research problem itself could not exist. This paper assumes that the population from which the samples were taken are homogeneous for both countries, Malawi and Zimbabwe. The national communities are exposed to same climatic hazards, economic threats and political conditions. The samples are withdrawn from normally distributed populations. Each value is sampled independently.

The researcher further assumes that having a bank account effectively means the interviewee is financially included regardless of use. Moreover involuntary skipping a day without a meal means the interviewee is food insecure. Another assumption is made that the interviewee were made to understand the words used in scoring level of food insecurity from 1-Always, 2-Often, 3-Sometimes, 4-Rarely and 5-Never gone without a meal a day.

1.8 Delimitation/ scope

The results of this study could be generalised to households who are 15 years and above in Malawi and Zimbabwe. The choice of this topic on the impact of financial inclusion on food security emanated from researcher having feeling that there is much marginalisation of many from accessing financial products in countries in Sub Sahara Africa, whereas their inclusion would change their quality of life. It is the sense of humour and desire to highlight the
implication of financial inclusion on the welfare of the people. Choosing Malawi and Zimbabwe ideally improves the researcher’s concentration and ability to manage the data during this learning process. In the researcher’s next study on this topic, he will use panel data and involve all nations in Sub Sahara Africa.

1.9 Limitations

The major barriers limiting this research were data access, time, resources gathering and finances. Accessing data that conform to this research requirement was difficult. Moreover the data for financial inclusion data collection in Sub Sahara Africa is a recent move; there is limited data that describes the structure for old decades therefore this limited the researcher to concentrate on cross sectional data rather than panel data. Cross sectional data is a snapshot, thus does give limited information of what a variable is actually being. Panel data has the advantage of giving the financial behaviour of each country over a period and comparing nations in this regard give a sound understanding of the impact of financial inclusion on food security. This will do away with characters that arise by chance within a year. Shocks that happen once off may alter the decisions of the researcher if data is collected over a period of time.

Time is a factor that hinders ability to gather data consult on methodology and research. This actually compromises judgement. However the researcher adopted a robust methodology in this paper regardless of it being the correct method. The time space involved between research need identification and submission of this academic set piece was so short and posed much pressure on the researcher to deny him other privileges of the time.
It is a misfortune to undertake research in the hard economic times. Gathering data, making consultations, visiting the internet and communication with the supervisor calls a significant budget. The cost of this research paper takes a larger portion of the researcher’s income, therefore resulted in the researcher a victim of food insecurity. However a sacrifice was done so as to complete this paper and yield earnest results that would contribute to a pool of literature in finance and economics.

1.10 Definition of terms

Food insecurity: all people, at all times, have no physical and economic access to sufficient, safe, nutritious food to meet their dietary needs and food preference for an active and health life.

Financial inclusion: is a process of ensuring access to appropriate financial products and services needed by vulnerable groups such as weaker sections and low income groups at an affordable cost in a fair and transparent manner by mainstream institutional players.

Heterogeneity: is a quality or state of consisting dissimilar or diverse elements.

Homogeneous: are the items of a group that are all alike, interchangeable, or uniform.

1.11 Summary

This chapter gave a snap shot of what this research covers. It starts from the origin of the problem statement and how the researcher seeks to attend to the problem by setting clear cut objectives. The chapter clarified generalised assumptions which
made it possible to progress with the study. The researcher also highlighted the limitations to the study and how the researcher dealt with them. Furthermore the scope of the problem is identified. The chapter closed by defining the terms introduced which are crucial to the whole of this paper. Progressing to the next chapter, the researcher looks in the theory that oscillates around financial inclusion and food security.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Finance is at the core of the development process as backed by solid empirical evidence, development practitioners are becoming increasingly convinced that efficient, well-functioning financial systems are crucial in channelling funds to the most productive uses and in allocating risks to those who can best bear them, thus boosting economic growth, improving opportunities and income distribution, and reducing poverty (Demirguc-Kunt et al, 2008). This chapter reviews literature pertaining to the research subject of financial inclusion on food security between Malawi and Zimbabwe. It focuses on theoretical framework that informs, explains and describes financial inclusion on food security. It further analyses the concepts of financial inclusion, whether it has influence on food security in Malawi and Zimbabwe and assess whether there is heterogeneity in the impact of financial inclusion in Malawi and Zimbabwe.

2.2 Theoretical framework

2.2.1 Theory of financial market imperfection by Greenwald and Stiglitz (1993)

The theory postulates that because financial markets may not be perfect due to information asymmetry, persistent income inequality or poverty traps prevails. This explains cyclical movement in real business, real product wages, and output and investment patterns. Without inclusive financial systems, poor individuals and small enterprises need to rely on their personal wealth or internal resources to invest in their education, become entrepreneurs, or take advantage of promising growth opportunities (Demirguc-Kunt et al, 2008). The talented poor and the micro-enterprises that lack collateral, credit histories, and connections, are limited in their opportunities and leading to persistent inequality and slower growth. Public policies that focus on redistribution of wealth and resources will foster growth according to this theory.
Most redistributive policies create disincentives to work and save, although the economic magnitudes of these disincentive effects are a subject of intense debate (Aghion and Bolton 1997). As Demirgüç-Kunt and Levine (2007) argue, these tensions vanish when focusing on financial sector reforms. Reducing financial market imperfections to expand individual opportunities creates positive, not negative, incentive effects.

2.2.2 Solow-Swan growth model (1956)

The model emphasises on technological growth (improvement in the financial access) as a source of economic growth and development. Economic growth and development improves on the quality of life of the people which includes improvement to access to food. According to Solow, lags in the diffusion of technology and differences in real income differentiate the rich countries from the poor countries. Efficient allocation of international capital flows determines development and growth. Finance and capital accumulation and human capital development are positively related to real growth whereas population growth negatively affects economic growth. Financial inclusion is viewed as a device for the new vision of inclusive growth (Chakrabarty, 2009 and Mehrotra, 2009). Development of financial sector is crucial for inclusive growth (Ianchovichina and Lundstrom, 2009). Inclusion of the marginalised talented households and firms enhances economic growth and improvement in their welfare.

2.3 Empirical framework

2.3.1 Financial inclusion

Extensive empirical evidence suggests a significant and robust relationship between financial depth and growth. More recent micro evidence using firm-level data sets suggests that better-developed financial systems ease financial constraints facing firms. This finding illuminates one mechanism through which financial development influences economic growth.
Furthermore, researchers recently have shown that financial depth reduces income inequality and poverty and is thus particularly beneficial for the poor.

According to Chen (2008) the number of people that are excluded or underserved by the formal financial sector concentrates in rural areas of low-middle-income countries, where there is also a coincidence in the concentration of poverty. In his 2009 research, Collins noted that many low income adults rely on informal financial services. Researches by King and Levine, 1993; Beck et al, 2000; Clark et al, 2006, Beck et al, 2007 and Demirguc-Kent and Levine, 2009 empirically linked measures of financial depth with greater economic growth and lower income inequality. All these explain recent growth in importance of financial inclusion.

The establishment of Maya Declaration in 2011 has been an important progress that made financial inclusion for all, especially for the poor and vulnerable population. This is a policy priority in many developing countries. The 2030 Agenda for Sustainable Development defines financial inclusion as “secure and equal access to financial services and recognises it as “a powerful enabler” to end hunger, achieves food security and improve nutrition and promote sustainable development (UNSGSA 2016).

Financial services represent tools that can potentially help manage the household income available for investment and consumption. How efficiently this can be achieved might depend on their specific features as well as on the adequate suite of financial services available to the household. This could further bring positive results in terms of food security experience of household members as they would feel more confident about their economic resources to access food when needed.

At macro level, the cross-country evidence suggests that as the financial system develops offering a wide set of services with greater outreach and depth, it reduces poverty and inequality.
and increases economic growth (Sarma and Pais 2011). Financial inclusion in household’s food security in particular has been examined indirectly.

2.3.2 Financial inclusion state in Malawi

The Government of Malawi is embarking on reforms aiming at increasing inclusive finance. This is as a result of the realisation that financial inclusion is essential to boost agricultural productivity and production starting or expanding micro and small enterprises, creating employment, increasing household income and smooth consumption (Ministry of Finance, 2010). Reforms have been undertaken in Malawi’s financial sector in the past decade; and more recently, innovations have been implemented by various market players in an effort to expand the reach of financial services (Oxford Policy Management, 2009). Despite these developments, however, a significant proportion of the country’s population still continue to face severe constraints in accessing financial services including savings, credit, insurance, and payment services (Oxford Policy Management, 2009).

The nation adopted a five years national strategy from year 2010 to 2014 targeting an improved financial and investment capacity. Malawi’s financial sector consists of commercial banks, Microfinance institutes, insurance and saving and credit cooperative societies. The government is engaging different participators to enhance its success and do away with the resource gap challenge. Some of the partnered institutes include UNDP and UNCDF

The economy depends mostly on agriculture, and 84.6% of the population live in rural areas. The financial services sector in Malawi is mostly patronized by the high income population residing in the urban and city areas, leaving out the major part of the population, which is low income and rural based (Majanga, 2016). Reports on the financial access in Malawi reveal that 19% of the population are bank account holders, 55% do not use any financial product and 74% save their wealth in cash and kind (UNCDF, 2014). As a result of the failure to extend her
financial services to the low income and rural masses, Malawi fails to overcome some of its development challenges which are of age now (Majanga, 2016). The government of Malawi is however implementing measures that will encompass the marginalised and the financially excluded in order to accelerate economic growth

2.3.3 Financial inclusion state in Zimbabwe

The causal relationship between financial development and economic growth is seen to operate through three linkages: (1) financial deepening promotes economic growth; (2) economic growth stimulates financial development; and (3) financial development and economic growth influence each other (World Bank 2007). The Reserve Bank of Zimbabwe has long recognized the imperative of financial inclusion and monetary policy statements (Makina et al, 2014). The FinScope survey on financial inclusion in Zimbabwe conducted in 2011 found that 65 percent of the country's population live in rural areas while 35 percent live in urban areas, and that on average 80 percent of the adult population earn less than US$200 a month, while about 17 percent do not have an income. The survey established the level of financial inclusion as that only 24 percent of the total population is banked and of this only 12 percent of the rural population is banked. There is a large population not having access to financial services at all either through the formal or informal system, 40 percent in the case of the whole population and 51 percent in the case of the rural population (Makina et al, 2014). Furthermore according to this researcher, financial exclusion in Zimbabwe tends to be correlated with poverty levels.

According to Munyanyi (2014), mobile money uptake has transformed the banking sector and aided in embracing the marginalised into a stream body of financial inclusion. His research revealed that about 90% of the population are registered for EcoCash. Access to EcoCash is more prevalent than access to traditional bank accounts where only a 52% of the population in the rural areas have a bank account.
2.3.4 Food security

Food security was formally recognised as a human right more than half a century earlier by the United Nations in the Universal Declaration of Human Rights (1948). The Rome Declaration on World Food Security (1996) provides a complex but generally recognised definition, food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life. This physical and economic access to food is what we believe to be judged by individuals depending on their possibility to use adequate financial services and how this can affect their income and food consumption.

Carman (2016) find that low income households who exhibit financial literacy are less likely to experience food insecurity in her empirical study of financial literacy and food security in the United states of America. In her findings, postulates that 7% of households with income 185% above the Federal Poverty Level struggle with food insecurity, while 58% of households below the Federal Poverty Level do not (Coleman-Jensen et al, 2014). With this regard food insecurity is not an issue of the poor alone; it is an issue not of income alone but of financial literacy.

2.3.5 Food security in Malawi

Malawi has been producing adequate of their staple food maize for a long time. Maize accounts for 60% of total food consumption. The Government of Malawi has for many years placed great emphasis on maize production for food self-sufficiency at both household and national levels (GoM, 2011). The government of Malawi is rolling out programs that intensify input use and adoption of improved varieties. The government implemented the Malawi’s Farm Input Subsidy Program (FISP), which has been implemented since 2005. The program was designed to improve poverty outcomes and ensure the country’s food security by enhancing agricultural productivity and yields (Arndt et al., 2013). The increased maize productivity may have
subsequently enabled attainment of maize self-sufficiency at the household and national levels (Chibwana et al., 2012). Ecker and Qaim (2010) point out that food consumption in Malawi heavily staple dominated and characterized by a high risk of malnutrition. The finding that women’s access to microcredit improves children’s nutrition shall suggest intra-household allocation proceeds according to the Collective Model (Hazarika and Guha-Khasnobis, 2008).

2.3.6 Food security in Zimbabwe

Zimbabwe’s domestic cereal output for human and animal consumption has persistently been either declining or fluctuating below required level which has resulted in increasing levels of food insecurity at both the national and household levels (Muhoyi et al, 2014). A variety of schemes aimed at improving input use and productivity has been implemented since 1980. Programs like Government Input Scheme (GIS), Operation Maguta/Inala, Champion Farmer Programme, the Agricultural Support and Productivity Enhancement Facility (ASPEF), Farm Mechanisation Programme were all pioneered by the government of Zimbabwe and they yielded varying levels of success in addressing the food insecurity challenges (Muhoyi et al, 2014).

2.4 Summary

This chapter gave literature around the problem of food security and financial inclusion. The literature was developed from the theory and empirical studies done in different nations. From the literature we found that a lot needs to be done pertaining financial inclusion and food security. Empirical studies undertaken support the theory that financial development potentially increases sustainable economic growth and food security. This is also the focal area of this paper.
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter proffers a description of the research process adopted. It provides a description of the method undertaken and justification for the adoption of that method. This chapter also describes the population, sample and the techniques used to arrive to the sample size. It discusses the validity of data. Zikmund (2005) said that a research design is a master plan specifying the method for collecting, and analysing the needed information.
3.2 Research design

The researcher adopted secondary data in this research to test the hypothesis raised in the opening chapter of this paper. The research process is built around the literature described in chapter two. The methodology support itemisation of causal relationship between financial inclusion and food security. A comparison between Malawi and Zimbabwe enables the researcher to identify heterogeneity. This will give policy makers a wider explanation of the effect of financial inclusion on food security.

3.3 Target population, sample size

According to this paper, the target population includes adults in Malawi and Zimbabwe. However due to prohibitive costs, the researcher used secondary data gathered by Finscope in 2014 interviews they conducted in a series of countries including Malawi and Zimbabwe. Malawi sample comprised 3005 households and Zimbabwe sample comprised 4000 households interviewed to provide a combined dataset of 7005 households. The samples were obtained from national representative resident population aged 15 and more.

3.4 Research instruments

We use cross-sectional data from FinScope 2014 Consumer Survey gathered from questionnaire that included both financial inclusion and food security at once. Data were collected at individual level from national representative resident population aged 15 and more. Bibliography of each household was captured. Financial inclusion module questioned each household on financial literacy and inclusivity whilst food security module questioned households on access to nutritious food timeously at affordable prices.

3.5 Source of data

FinScope was launched in South Africa in 2002 and covers 18 African countries and 3 Asian countries (FinScope, 2002). The major aim was to monitor and evaluate financial inclusion and
design appropriate products and models that ensure access to financial services. This gave birth to the 2014 Finscope Consumer survey data for Malawi and Zimbabwe utilised in this research paper. The two governments are adopting policies that aim at improving financial literacy and financial inclusions noted by Oxford Policy Management in 2009 and Makina et al in 2014) in their empirical studies for Malawi and Zimbabwe respectively. Individuals and small holder firms are encouraged to participate in formal finance systems resulting in no part of the population was established as the control. The researcher compared the participants who were more and less exposed to food insecurity with the hypothesis that being financially included affects food security. In this case financial inclusion varied at each point depending on the background characteristics as stated by the hypothesis that background characteristics affects financial inclusion. Financial inclusion was thus summarised in a dichotomous manner as Yes or No financial inclusion for the participant or household. Data was processed using STATA 14.

3.6 Validity and reliability of data

Hussey and Hussey (1997) regard reliability as the instrument which measures the repetition of the research findings, whereas validity as the extent to which the research findings accurately represent what is really happening in the situation. Data test validation was done using the T-test. A star (*) was put to show results of T-test. Three stars (***') depict that results are validated at 99% confidence. Since most of the questions were dichotomous or binary in nature, logistic regression was adopted as the most appropriate method to process the data. Moreover the use of inverse probability weighting was adopted to estimate marginal effect of financial inclusion on food security.
3.7 Empirical estimation

3.7.1 The concept of inverse probability weighting

Non-randomisation brings more bias but it is hard to do away with it when dealing with social intervention. Non-randomisation brings bias due to self-selection, missing data and confounding. The researcher resorted to Inverse Probability Weighting in this paper to eliminate the challenge brought by non-randomisation. The main reason being that, it is prohibitively hard to apply randomisation when contacting a survey in a social community as it may result in non-participation. Friends, relatives and partners in the community cannot be prohibited from participating in national consumer surveys. IPW is an invaluable tool in dealing with selection bias and complex confounding evaluation (Lippman et al, 2010).

3.7.2 Variable estimation

Inverse probability weighting is implemented under the assumption of consistency, exchangeability, positivity, and no misspecification of the model used to estimate weights. Weighting can appropriately adjust for measured time-varying confounders affected by prior exposure. The causal effect of financial inclusion on food security can be estimated using unbiased estimator as below following the assumptions stated above

$$\hat{\beta} = \frac{1}{n_T} \sum_{i:T_i=1} Y_i - \frac{1}{n_C} \sum_{i:T_i=0} Y_i$$

The equation above shows the difference in means of the treated and the control. The values $n_T$ and $n_C$ are numbers of households in the treated and control groups. This difference in means is shown in Table 2 of Chapter 4 where the results are explained. The treatment group is those individuals who are financially excluded and the control group is those who are financially included and the outcome $Y_i$ depicts their food security score or status.
Estimating the causal effect of financial inclusion on food security is a barrier of confounders. These are variables that influence both the dependent variable and independent variable which results in spurious association. Inverse probability weighting adjust for confounding factors. Therefore in estimating the causal relationship between two outcomes \((Y_1)\) and \((Y_0)\) we introduce an adjusting factor \(T/X\) where \((Y_1, Y_0) \perp T/X\).

Using propensity score matching which in this case is the probability of being financially included and that of being financially excluded we establish the probabilities

\[
p(x) = p(T = 1/X = x) \quad \text{ ..........(1)}
\]

The inverse of this probability becomes the weight. Equation (2) is the weight of the treated whereas equation (3) is the weight of the control as shown below:

\[
(w)^T = \frac{1}{p(x)} \quad \text{ ...............(2)}
\]

\[
(w)^C = \frac{1}{1-p(x)} \quad \text{ ...............(3)}
\]

Applying the logistic regression model we can estimate this probability of treatment (propensity score) as shown by equation (4)

\[
\hat{p} = \frac{1}{n_T} \sum_{i:T_i=1} \hat{p}(X_i) - \frac{1}{n_c} \sum_{i:T_i=0} \hat{p}(X_i) \frac{Y_i}{1 - \hat{p}(X_i)}
\]

\[
\hat{p}^{IP} = \frac{1}{n_T} \sum_i^n \frac{T_iY_i}{\hat{p}(X_i)} - \frac{1}{n_c} \sum_i^n \frac{(1-T_i)Y_i}{1 - \hat{p}(X_i)} \quad \text{ ..........(4)}
\]
Equation (4) is the inverse probability weighted estimator of the causal effect of the impact of financial inclusion on food security. The researcher applied STATA to calculate the IPW and the results are displayed in Table 5 and Table 6 in Chapter 4.

### 3.7.3 Bias and confounding

Randomisation is a challenge in community surveys of this nature; therefore non-randomisation is adopted. This presents a problem of selection bias. Those who chose to be interviewed maybe those who have the experience in participation in such national programs. Comparing the financially included from the excluded is likely to be confounded. (Lippman et al, 2010). Moreover time dependant confounding may exist where past experience, covariates and exposure may impact on subsequent outcomes.

### 3.7.4 Weighting to balance populations

The idea of weighting observations in a survey sample is based on the idea that the sample surveyed is not quite representative of the broader population (Barter, 2017). Inverse-probability weighting eliminates confounding through creating a “pseudo-population” in which the treatment is independent of the measured confounders. This makes the sample to be more like true replica of the population. More weight is given to the underrepresented and less weight is given to the more represented. We estimate the marginal effect by comparing odds of presenting with food security when one is financially included to odd when one is not financially included. This is called marginal probability of treatment effect. This is done by pooling the data together in STATA 14 in a period and estimate the marginal treatment effect using logistic regression technique. The logistic regression model predicts the probability of treatment (propensity score).

Finally a logistic regression was run to establish the contribution of each variable that affect financial inclusion on food security. The researcher went on to use inverse probability
weighting method to assess the impact of financial inclusion on food security. Since there are so many factors that affect food security, average treatment effect alienates the impact of other variables not considered by the researcher.

3.8 Presentation and analysis

The findings from data processing were presented in tables, graphs and chats that enhances easy of understanding by the consumers of this paper. The analysis if data was done using computer statistical software called STATA 14.

3.9 Summary

This chapter gave a step by step approach of the methodology adopted by the researcher to reach to the findings guided by the research questions through the literature. Justification of methodology was highlighted. Validity and reliability of the methodology and research instruments used was done in this chapter. This chapter paves way for the presentation, analysis and interpretations made in the following chapter.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter presents interpretation of empirical results of the research conducted to answer the research questions:

a. What determines financial inclusion between Zimbabwe and Malawi?

b. Does financial inclusion affect food security in Zimbabwe and Malawi?
c. Is there heterogeneity in the impact of financial inclusion on food security between Zimbabwe and Malawi?

The results response to the objectives and research questions highlighted in chapter one. Moreover, the results are parameterised adhering to the theoretical framework and methodology pre-phased in this research. This chapter presents the results of the research in statistical manner, analyses and discusses the results. The interpretation of research results is done in a chronological order of question intensity under thematic headings. The chapter opens with a descriptive data analysis where determinants of financial inclusion are identified empirically. As the discussion deepens, the relationship between financial inclusion and food security is highlighted from the results of processed data. The chapter closes with assessing if there is similarity in the relationship of financial inclusion and food security for the two nations, Zimbabwe and Malawi. These results will aid in policy prescriptions to dampen food insecurity in Zimbabwe, Malawi and beyond.

4.2. Descriptive analysis

4.2.1. Background characteristics of Malawi and Zimbabwe combined

Table 1 Background characteristics of sample households by financial inclusion status

<table>
<thead>
<tr>
<th>Household is financially included:</th>
<th>Difference in means</th>
</tr>
</thead>
<tbody>
<tr>
<td>No [N]</td>
<td>Yes [Y]</td>
</tr>
<tr>
<td>Mean SD</td>
<td>[N – Y]</td>
</tr>
</tbody>
</table>

| Respondent is: Male               | 0.3966 0.4892 | 0.5816 0.4935 | -0.1850*** |
In Zimbabwe and Malawi, gender plays a role in determining financial inclusion. Men on average are financially included than women. We are 99% confident that on average 58.16% of those with bank accounts are men as shown in Table 1 whereas 41.84% are women. This gender gap is significant and worth to note. The reasons could be attributed to the fact that many women come from households that are larger, earn less income, are younger, divorced or unmarried, unemployed and uneducated. Culturally men were considered as the bread winners of the family. They were the ones who fend for the family. In this line, men have a higher chance of having an account. Those who attained lower years of education, on average they are more financially excluded than those who attained higher education qualification.

From Table 1 those interviewed and confirmed that they ended in the final primary level of education had financial mean exclusion of 0.3575 compared to mean financial inclusion of 0.1608. The results are skewed to the financially excluded at lower level of education. However at higher levels of education taking for example those who went through vocational training institutes are more financially included as depicted by a mean difference (financially excluded minus financially included) of -0.1032. This interprets that on average a greater proportion of
those who passed through vocational training is financially included. The more educated the person is the greater likelihood of being financially included.

The same table shows that when an individual is involved in other activities to raise income like fishing, it increases the chance of being financially included. An average of 0.1704 is financially excluded and compared to an average of 0.3219 financially included resulting in mean difference [N-Y] of -0.1515. This shows that a greater portion of those involved in fishing are financially included. However, those involved in peasant farming does not actually have much influence on financial inclusion. This may mean that other fishing activities are commercialised rather than general farming. However those who do both farming and fishing are more financially included as highlighted in Table 1 by mean difference of -0.0474.

4.2.2. Food security status

Table 2 Food security levels by financial inclusion status

<table>
<thead>
<tr>
<th>Financially included</th>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No[N]</td>
<td>3.459</td>
<td>1.285</td>
</tr>
<tr>
<td>Household is financially included:</td>
<td>Yes[Y]</td>
<td>4.175</td>
<td>1.125</td>
</tr>
<tr>
<td>Difference in Means</td>
<td>[N-Y]</td>
<td>-0.715***</td>
<td></td>
</tr>
</tbody>
</table>

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

Table 2 shows that being financially included reduces food insecurity holding other things constant. A higher mean of 4.175 compared to 3.459 explains that when one is financially included increases the chance of having access to food. The five score range of response to hunger in the questionnaire was as follows 1-Always, 2-Often, 3-Sometimes, 4-Rarely and 5-Never gone without a meal a day. A higher score means the household is food secure. Thus a
higher food security average scores for those who are financially literate show that in Zimbabwe and Malawi, financial inclusion reduces food insecurity to households.

4.3.2 Food security and financial inclusion by country

Table 3 Food security and financial inclusion by country

<table>
<thead>
<tr>
<th></th>
<th>Malawi</th>
<th></th>
<th>Zimbabwe</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Household is financially included:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No[N]</td>
<td>3.397</td>
<td>1.154</td>
<td>3.508</td>
<td>1.378</td>
</tr>
<tr>
<td>Yes[Y]</td>
<td>4.197</td>
<td>1.068</td>
<td>4.163</td>
<td>1.156</td>
</tr>
<tr>
<td>Difference in Means</td>
<td>[N-Y]</td>
<td>-0.800***</td>
<td>-0.655***</td>
<td></td>
</tr>
</tbody>
</table>

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

Table 3 shows that on average, financial inclusion has more impact on food security in Malawi than Zimbabwe. This is shown by a higher mean score of 4.197 in Malawi than a 4.163 in Zimbabwe. High mean difference of -0.800 in Malawi implies that those who are financially included are more food secure and those who are financially excluded are highly food insecure.

4.3. Empirical estimation results

4.3.1. Determinants of financial inclusion

Table 4 Logit estimates of determinants of financial inclusion

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Combined</th>
<th>Malawi</th>
<th>Zimbabwe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(I)</td>
<td>(II)</td>
<td>(III)</td>
</tr>
</tbody>
</table>
From Table 4, shows the logit results of factors that affect financial inclusion. The logit function results of combined nations show that the more a household is educated the more is financially included. However the impact of education on these results is higher and consistent in Malawi than in Zimbabwe. While education affects financial inclusion, lower level of education does not have much influence in Zimbabwe. The marginal impact of education on
The marginal impact of financial inclusion on household food security is 0.58 having treated the data for confounding. This means that improving the financial inclusion in Zimbabwe and Malawi increases food security. The greatest possibility of this positive relationship is that being financially included increases savings, credit worthiness and access to profit generating activities.
products. All this will improve household resistance to financial shocks and bought sterile against food insecurity.

4.3.3. Heterogeneity in the impact of financial inclusion on food security

Table 6 IPW estimates of heterogeneity in the impact of financial inclusion on food security

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Malawi</th>
<th>Zimbabwe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household is financially included</td>
<td>0.603***</td>
<td>0.454***</td>
</tr>
<tr>
<td></td>
<td>(0.0908)</td>
<td>(0.0648)</td>
</tr>
<tr>
<td>Observations</td>
<td>2,943</td>
<td>3,976</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6 shows that the marginal impact of financial inclusion is higher in Malawi than in Zimbabwe, when data is treated for confounding. It may potentially mean that a larger portion of households in Malawi are financially excluded than in Zimbabwe. It is higher in Malawi because the level of financial inclusion in Malawi is low than that of Zimbabwe.

This implies that the marginal effect of financial inclusion is increasing at an increasing rate while in Zimbabwe it is increasing at a decreasing rate.

4.4. Summary of hypotheses

Table 7 Summary of hypotheses

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>H10</td>
<td>Background characteristics of the household head affect financial inclusion</td>
<td>Failed to reject</td>
</tr>
<tr>
<td>Hypothesis</td>
<td>Description</td>
<td>Result</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>H2_0</td>
<td>Financial inclusion affect food security</td>
<td>Failed to reject</td>
</tr>
<tr>
<td>H3_0</td>
<td>There is heterogeneity in financial inclusion of food security between Malawi and Zimbabwe</td>
<td>Failed to reject</td>
</tr>
</tbody>
</table>

Table 7 above summarises the hypotheses to the research questions interrogated in this paper. Their corresponding research results are shown in the summary table above.

### 4.5. Summary

This chapter presented the results of the research on the impact of financial inclusion on food security. The results revealed that financial inclusion positively affect food security in Malawi and Zimbabwe. This is consistent with findings in the literature. In this regard the policy makers should prioritise provision of financial products to the marginalised populace so as to improve their food security. Being financially equipped will reduce the impact of food shocks.
CHAPTER FIVE

PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

5.1 Introduction

This chapter presents a summary of findings of the research. The chapter went on to prescribe some policy recommendations to be adopted. The researcher went on to recommend areas for further studies.

5.2 Summary of findings and conclusions

This research was conducted to establish the impact of financial inclusion on food security comparing Malawi and Zimbabwe. Secondary data obtained from FinScope 2014 Consumer surveys done in both countries was utilised. The research questions answered were

1. What determines financial inclusion between Malawi and Zimbabwe?
2. Does financial inclusion affect food security in Malawi and Zimbabwe?
3. Is there heterogeneity in the impact of financial inclusion on food security between Malawi and Zimbabwe?

Literature around this study was gathered from text books, professional journals, unpublished and published scholarly articles. Guided by these theoretical and empirical frameworks, the researcher processed the data using STATA. Inverse probability weighting and logistic regression function was used established to determine causality between financial inclusion and food security. The results were presented and interpreted.

The researcher found that background characteristics affect financial inclusion. An improvement in stock of knowledge through attaining higher educational qualifications improves financial inclusion. Engaging in other productive activities like farming and fishing improves the likelihood of the household to be financially included. The researcher found that
financial inclusion affect food security in Malawi and Zimbabwe. Based on the sample data used the researcher found as well that being financially included increases food security of the household. The paper shows that there is heterogeneity in the impact of financial inclusion and food security between Malawi and Zimbabwe. The marginal impact of financial inclusion on food security diminishes with increase in financial inclusion and these research findings herewith are consistent with the literature. The empirical findings show that the use of formal financial products improves individual’s income, smoothen consumption and improves the household food security status.

5.3 Policy recommendations

According to the literature, the governments are proving to be the major players in spearheading financial inclusion; therefore, the government should aim at factors that improve access and usage of financial products. The government is recommended to regulate the financial cost of using financial service to be affordable. The cost structure should take into account the capacity of the low income earners and the poor so as to encourage the use of the existing financial services by the poor and marginalised.

The financial sector should design appropriate packages of financial services that are aimed to support uptake by the poor and marginalised households. All designs should be focused on easy low cost, simplicity and accessibility as low income rural population is sparsely located which hinders active diffusion.

The researcher further recommends the governments to participate in awareness programs that educate the marginalised of the importance of having certain financial products with formal financial institutes. Workshops can be done through existing informal groups, cooperatives and religious gatherings that create a stock of financial knowledge for sustainable development.
The government, through local boards or public private partnership is recommended to establish Digital Infrastructure that improves access to mobile banking, mobile money, mobile insurance and mobile security that will encourage growth and consistent consumption which are clear parameters of descent welfare for the marginalised.

Another deviation point recommended herein is to engage micro-agriculture entrepreneurs in output based finance system whereby the government issues primary collateral for starter-ups in an effort to influence financial inclusion and food security. The participants are to be closely monitored and offered continuous teaching by technocrats.

The policy makers should promote the adoption of a diverse financial ecosystem which supports increased provision of these services by Non-Governmental Organisations (NGOs), electronic business, retailers and telecommunication companies. Support mobile banking platforms and internet payment platforms.

The establishment of research institutes the finance innovation in the financial sector will take nations’ steps closer to financial inclusion. Innovative banking ideas that will support reaching a wider community at lower of cost should be embraced.

5.4 Areas for further study

The topic of financial inclusion has taken centre stage in the recent past. Many of the papers are concentrating on the impact of financial inclusion in sustainable development, and emphasis is on serving the marginalised, however there is no much literature regarding assessing the profitability to financial institutes which would want to engage the rural and marginalised populace. Papers should give insight on the ways to eliminate barriers to access the marginalised by financial service supplier. Scholarly papers should give prescription of innovative banking models that will incentivise the bankers to want to serve the poor and marginalised people.
While propositions are made in literature on how to increase financial inclusion in developing nations, there is a feel that further analysis regarding use and benefits to the customer should be undertaken. There is a potential harm to the welfare of the households of using certain financial products. The researcher recommends further studies on the impact of identified financial products on household welfare.
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