THE IMPACT OF REMMITTANCES ON HOUSEHOLD FOOD SECURITY IN ZIMBABWE

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A dissertation submitted in partial fulfillment of the requirements for the Bachelor of Science honors degree in economics of Bindura University of Science Education Faculty of commerce.

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DECLARATION

I, BLESSING CHIKEYA, declare this research project herein is my work and has not been copied or lifted from any source without acknowledgment of the source.


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DEDICATION

I dedicate this work to the Alpha and Omega my parents Mr and Mrs Chikeya, my brothers and sisters, my nephews and nieces, my friends Audrey, Rumbi. Petty, Tsile and Gode. I love you all.
ABSTRACT
This paper presents data on the remittances sent by migrants to their families back home. It shows how remittances are affecting food security in Zimbabwe. Using logistic regression, this research assesses the connection between food security and remittances in Zimbabwe. Zimbabwe, like many other African countries, has been facing food deficiencies. Natural disasters like drought, which the country has been facing for the past two decades, and how climate changes have contributed to food shortages in Zimbabwe. The attainment of household food security is a major concern facing the world at large. Since Zimbabwe is primarily based on agriculture and depends much on the primary industry. This study attempts to estimate the food security status in Zimbabwe. It looks at how some other factors like gender, how gender heterogeneity affects remittances on food security using secondary data drawn from cross-sectional survey. In analyzing the data, a logit model was used. The maximum likelihood estimation was used in estimating the model. Model and variables are significant. The results of the regression analysis suggest that remittances, gender, marital status, household size, education level, and province influence household food security. Households that receive remittances have less chances of being food insecure than those not receiving. Households headed by females are found to be vulnerable to food insecurity, the probability of food security increase if household is headed by male. Gender affected food security negatively. Larger households experience less food security, since fewer resources are consumed by many people. Households headed by widows have higher chances of being food insecure than those headed by a couple. These results are based on household survey using cross-sectional data.

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ACRONYMS

BOP        Balance of Payment

FAO        Food and Agriculture Organization

GDP        Gross Domestic Product

IMF        International Monetary Fund

IOM        International Organization for Migration

MLE        Maximum Likelihood Estimation

OECD       Organization for Economic Co-Operation and Development

OLS        Ordinary Least Squares

RBZ        Reserve Bank of Zimbabwe

UN         United Nations

UNDP       United Nations Development Program

UN-INSTRW  United Nations International Research and Training Institute for the Advancement of Women

ZIMVAC     Zimbabwe Vulnerability Assessment Committee
CHAPTER ONE

INTRODUCTION

1.1 Introduction
This study seeks to investigate the impact of remittances on food security. Food security is defined by the United Nations as a condition in which all people at all times have access to enough food needed to live an active life (Food and Agriculture Organization [FAO 2010]). Zimbabwe is characterized by low Gross Domestic Product (GDP), low income, and poverty which lead to under nutrition (International Monetary Fund [IMF, 2011]). Zimbabwean households are found vulnerable to food insecurity. Due to these factors Zimbabweans outside country send or remit some of their earnings back home called remittances (Reserve Bank of Zimbabwe [RBZ, 2013]). Remittances are funds sent by individuals to their mother country via transfer or wire. Remittances are typically transfers from a well-meaning individual or household. They are targeted to meet specific needs of the recipient and thus tend to reduce poverty. Its use is agreed by both parties. Cross country analyses generally find that remittances have reduced the share of poor people in the population (Adams and Page, 2003). One of the major cash inflows in developing countries is that of diaspora remittances and has increased from 325 billion in 2010 (World Bank, 2011). The level of remittances has been growing (Gupta et al, 2009). These earnings are an important source of foreign funds for developing countries. Diaspora remittances are defined as total migrant’s transfers back to their home countries (Ratha, 2003). They are also defined as the net worth of migrants who are expected to remain in host country for more than a year (IMF, 1993). These can be formal or informal or tangible or intangible. Earnings from people working in foreign lands are a life line for development. Diaspora remittances do affect things like employment, investment, saving, poverty and also household’s food security. By contributing directly to the household’s income remittances leads to better access of food. Since Zimbabwe is an agro based economy remittance bridges the gap as a source of income to households, thus ensuring their food security. Food security is defined as people’s security against risks of not having access to the required food (FAO, 1992). It is when household suffers from a temporary decrease in their food consumption level (Chung et., a.11997). Household face
natural disasters like drought and other climate risks. Households rely on traditional mechanisms, (diversification of the agricultural income) but also on remittances (Harrower and Hoddinott, 2005). The impacts of remittances inflows have generated considerable interest to policy makers and academics. Academically some works have looked at the impact of remittances on food security. Therefore it is the aim of this study to look on effect of remittances on household food security in Zimbabwe.

1.2 Background of the study

World over the number of migrants is said to be more than 1 billion the average age of the migrant recorded at 35 years (International Organization of Migration [IOM, 2015]). Some changes and economic shakiness in most nations are the reasons for the increasing number of migrants (Organization for Economic Co-operation and development [OECD], 2009). However migration has become an important strategy among households in developing countries, Zimbabwe is of no exception. These migrants then send some of their earnings back home to their loved ones which have an impact on social economic welfare of those of those left (World Bank, 2014). The level of remittances to developing countries have developed by 9% yearly since 2013. Nations that receive remittances are encouraged to embrace the diasporas that are sources of income, economic opportunities, technology transfer, political support (Newland and Patrick, 2004). Remittance flows guide against uncertainties like income and consumption cost Briere et al (2004). Remittances decrease a country’s Balance of payment (BOP) deficit and also increase foreign currency reserves, though some researchers argue that remittances are causing increase in the demand for outside made goods (Pant, 2008). Income from remittances is relatively stable and it can be used for investment purposes by household which will better their livelihoods (Taylor, 1999)

According to IOM the first scrutiny on remittances was done by (Johnson and Whitelaw, 1974). It was later on improved during the mid-80s by some school of thoughts who invented some theories (Lucas and Stark, 1985). Zimbabwe produces a huge number of migrants with 70% of the migrants being in South Africa which is the highest and Australia and New Zealand being the least with 1% (United Nations Development Program [UNDP, 2015]). The reason for more migrants in South Africa may be due to the trade and political relations.
In Africa food security has been of great concern. ‘Food security exists when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and health life’ (FAO, 1996). Current evidence show that remittances, are helping to improve the livelihoods of households in many low income countries (FAO, 2013; Tinajero, 2009; Kiawa and Jones, 2013; Banga, R and Sahu, 2010, Williams et.al. 2013).

The United Nations International Research Training Institute for the Advancement of Women (United Nations International Research and Training Institute for the Advancement of Women [UN-INSTRAW]) has hunted to appreciate the gender angles of migration, remittances on food security since 2004. Remittances can be only income for widowed mothers who are often excluded from employment and are especially vulnerable to poverty (UN-INSTRAW, 2008b).

Females are typically constrained by society. There are unequal control relations between females and males. Reproductive duties were assigned to women they are loaded with household obligations. Female migrants also tend to assume greater responsibility for money transfers to extend family members (Orozco et al., 2006).

(IOM, 2010a) IOM put in place some projects in Tajikistan to improve the impact of diaspora remittances and economic development. 35% was women involvement and 35% percent loans were granted to them which saw women coming up with great business ideas. Female headed households started running sustainable businesses.

Less attention has been paid to the effect of remittances on food security in developing countries. This study seeks to determine how remittance inflows are affecting food security in Zimbabwe.

1.3 Problem statement
Coming second after export proceeds diaspora remittances have been the country’s biggest source of foreign currency with a total amounting to 95 million in 2015 (RBZ2016). Despite all the efforts by migrants to curb or reduce food insecurity in Zimbabwe, households are still suffering from food insecurity. Zimbabwe is a low-income country and has been hit by worst economic and political performing environment shown by food insecurity amongst households. The country persistent social and economic inequalities have reduced access to food (Vella, 2012). Most households face inadequate access to food security both in rural and urban areas.
ZIMVAC, 2015), for a country which used to be the bread basket of Africa. Theory said that remittances should decrease food insecurity; however, that’s not the case in Zimbabwe. According to the amended constitution of Zimbabwe every citizen has a right to access food and water. A number of questions have been asked on why there is food insecurity when a country is receiving remittances which are economically significant. Remittances have largely catered for basic needs of beneficiaries (Ratha, 2007). So far, no other study has been done to establish the current position regarding this problem or its extent in Zimbabwe. It is this researcher belief that the effects of remittances are not recognized by the policy makers of Zimbabwe. It is upon this background that the study seeks to investigate the effect of remittances on household food security in Zimbabwe.

1.4 Objectives of the study
1) To investigate the impact of remittances on food security in Zimbabwe.

2) To determine gender heterogeneity in the impact of remittances on food security in Zimbabwe

4) To offer policy recommendations based on the findings of the study in Zimbabwe

1.5 Research questions
1) What is the relationship between remittances and household food security in Zimbabwe

2) What is the heterogeneity impact of gender on remittances to food security of a household?

3) What are the policy recommendations to Zimbabwean policy makers?

1.6 Research hypothesis statement
Ho: Diaspora Remittances increases the level of food security
Hi: Diaspora Remittances does not increase the level of food security.

1.7 Justification of the study
Zimbabwean social and economic welfare continues to experience decrease in the food security (IMF, 2011). This study shed light on the economic and social factors that affect food security of Zimbabwean households. Food security is an integral part of Human security and individual access to food is a substantial Human right (Seulveda, 2004). This research will give evidence of effects of remittances on household food security. The research will highlight ways that can be used increase food security levels in Zimbabwe. To add on this piece of work will help develop
the financial intermediation from the financial sectors since there will be competition and some innovation in offering of financial services. The study will also help in the academic field as it can be used for schooling purposes were students can even use it as a guideline when carrying or researching on similar project. This research will assist policy makers in putting together strategies in decision making. It can provide important information to both the public and private institutions.

1.8 **Limitations of the study**
- The researcher had limited information due to the bias of those in power limiting on what the researcher can find out because of confidentiality of certain information. The researcher however spoke to the authorities and got permission and overcame this challenge.
- The researcher relied much on secondary cross-sectional data.
- The research was performed in a short period thus some aspects may have been left out.

1.9 **Delimitations**
The study focused mainly on the impact of remittances in Zimbabwe in the year 2014. It mainly looked at cross border remittances.

1.10 **Assumptions**
- There is no spurious relationship.
- The data used provides the paramount information for this research.
- Life challenge of skipping a meal as an indicator of food security.

1.11 **Definition of terms**

**REMITTANCES**—Consist of goods or financial instruments transferred by migrants living and working abroad to residents of the home economies of the migrants. It is limited transfers made by workers that had stayed in foreign economies for at least one year while transfers from migrants that are self-employed are excluded (IMF, 1999).

Remittances are monetary and non-monetary items that migrants earn while working abroad and sent back to their families living in their homeland (Tewolde, 2005)
**FOOD SECURITY**–Is the availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in the production and prices

Food security exist when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and health life (World Food Summit ,1996)

**GENDER**- Refers to socially constructed characteristics of women and men.

**HOUSEHOLD** –An economic unit which is defined for the purpose of the census of population as single person living alone or a group voluntarily living together, having meals together and benefiting from housekeeping shared in common.

1.12 **Scope of the study**
This study focuses on the relationship between Diaspora remittances and food security and how it leads to development in developing countries like Zimbabwe. Food security is the outcome variable while Diaspora remittances, gender, household size, age of head of household, marital status, education level marital status and province of the household.

1.13 **Organization of the study**
The research project is organized into five chapters, where the first Chapter presents the introduction of the study. Chapter two is the theoretical and empirical review. The research methodology is discussed in Chapter three and Chapter four shows the results of the study. Policy recommendations are discussed in Chapter five.
2.1 Introduction
This chapter will review the literature on the subject of the impact of Diaspora remittances on the issue of hunger in Zimbabwe. A review of preceding empirical and theoretical results will be done in two sections starting with the theoretical framework.

2.2 Theoretical background

2.1.0 Altruism theory
This is a theory which says there is a behaviour which is meant to benefit another person rather than oneself. The theory observes that remittances are countercyclical; increasing when country home is in turmoil (Chami et al., 2003). Migrants primarily send remittances because they care about the wellbeing of those left behind. The migrant’s utility function is the sum of his own consumption and that of the household back home (Aggarwal and Horowitz, 2002).

2.1.2 Exchange theory
The motive here is exchange. Migrants remit to their families or parents to represent services rendered. These may include looking after their grandchildren in the absence of the migrant parents of the children (Cox and Rank, 1992a) and Cox et al. (1998b).

2.1.3 Self interest theory
It suggests migrants remit because of their own self-interest. They remit for them to accumulate more wealth, gain inheritance, social security when they return back home (Hagen-Zanker and Siegel, 2007). Seeing that the probability of inheriting is high a migrant may remit more toady as he is motivated. (Hoddinott, 1994) proposes that migrant and his family enter into an agreement were the remittances are to win favour from the household head. A migrant would remit to buy fixed assets like land, vehicles and houses for use when he returns. This is done through trusted members of family who are held accountable for them.

2.1.4 Optimist theory
The optimist theory view migration as a way of allocating resources in a way that benefits nations receiving and the sending and according to (Todaro, 1969). It views the allocation of
resources from country to country as a necessary action towards development. Remittances have positive impact to the recipient nation. This theory views migrants as utility maximizers and it does not accommodate the issue of remittances (Taylor, 1999). They believe remittances remittance is positive to the receiving households or countries and ease pressure on governments faced with large external deficits to engage in difficult structural reforms.

2.1.5 Developmentalist theory
Developmentalists assume that third world nations can experience economic growth and development if they get to receive money from first world countries inform of remittances, financial loans and financial aid. They believe migration leads to inflow of funds and modern knowledge and the increase in remittances would develop third world increase. They are however criticized by pessimist who believes remittances are bad for a country as the lead to dependency syndrome.

Other theoretical work on remittances

Wahbah (1991) -suggest that they are motives of remitting. He managed to divide them into a set of four. There are saved remittances, fixed remittances, potential remittances and discretionary remittances.

- **Saved remittances**-These are the remittances that policy makers should concentrate on as they encourage the migrant to invest for development in the home county (Lowell and Gerova, 2004).
- **Fixed remittances**- The unchanging monies that are remitted. It’s the minimum to cover for the basics.
- **Discretionary remittances** – These are influenced by whether the migrant wants to maintain a store of value either in the host country or at home and are influenced by interest rate differentials, the state of the economy, exchange rate movements and efficiency of money transfer facilities. Together with fixed remittances they constitute the level of actual remittances.
- **Potential remittances** – These are remittances which represent the maximum remittable funds at any given point after the migrant has met all expenses in the host country.
(Stark 1991 and Gubert 2002) suggests migrants remit and allow risk-averse households branch out their income sources and thereby reduce risks associated with income shocks. In the recipient country income from remittances can be considered as proof from future unknowns or guides against associated risks.

(Ratha, 2003) concludes that remittance does not only raise the food consumption level of the receiving country but it also has the multiplier effect because they are mostly spent locally on home-produced goods.

2.2 Empirical review
There have been a few studies carried out to observe the impact of remittances. It looks as if most of these studies are in agreement on how remittances, gender, age, education level, marital status, province, size of household influence the food security of a household through a few focus on related linkages. They are only but a few studies that have tried to look at the food security status. Below are some of the empirical studies which start by giving an understanding about food security.

Developments in understanding of food security resulted in the expansion of the concept of food security by (FAO, 1983), by incorporating food secure access for vulnerable people to available supplies. This implied that there had to be a balance between the demand and supply side of the food security equation. The focus was that there should be assurance for all people at all times by ensuring both physical and economic access to the basic food that they needed. Studies on the impact of remittances on food security Zimbabwe are not common.

Remittances do contribute to the food security of households (UN-INSTART, 2008). They are sometimes the only source of income and they do help improve the economic situation of receiving households. Especially in cases where women have a high degree of control over the use of remittances. The mostly spend remittances on nutritional, health care and educational needs of the house. (UN-INSTART, 2005) did a research in Guatemala on gender and it showed that 50% of remittances are used for consumption goods, though men spend slightly more on these items than women who spend slightly more on health and education. Women remittances use has often been considered as unproductive though it can be argued that
investment in food, education and health is an important factor in alleviating poverty and thus for furthering development (Data et al., 2006).

Babatunde, R.O (2010) did an analysis on the effects of remittances on household food security and nutrition in Kwara State Nigeria. He used descriptive and econometrics analyses to test if remittances do improve food security including the quality of the diet. The results showed that receiving household are better off and that remittances do contribute to improved food security. He also figured that remittances are important for food consumption but they are not spent on quality, nutrient foods apart from buying starch staple foods.

Regmi (2015) conducted a study on the impact of remittances on food security in Bangladesh. He used integrated household survey data using two indicators for measuring food security. The results obtained from ordered probit regression models indicated that remittances play an important role to improve food security of a household. He also included other variables like gender and income. An increase in annual remittances of 10000 Bangladesh Taka significantly increases the probability a household to be in the acceptable food consumption category by 0.5%.

Jimenez (2009) did an analytical study comparing between households receiving remittances and those not receiving in Mexico in a village of Tlapanala. Outcome of the study showed that food consumption expenditure increased and were higher in households that received remittances, though the consumption pattern did not have a significant change. Household consumption increased by 35%. The same results were obtained in Ghana by Quarterly and Blankson (2004), were receiving households had an increase in food consumption.

Adeyemo, Olajide (2013) examined the impact of remittances on a local level in Nigeria. They studied the rural patterns of remittances on food security in rural areas. The analyzed using the probit regression. The findings of this study showed that more cash remittances were sent to rural areas. These remittances are significantly reducing the chances of households being food insecure.

Abadiet., al (2007) did a study on the impact of household food security in a State in Ethiopia. He used a sample of 301 observations and his results showed that households with access to
remittances have significantly lower coping strategy index and household food insecurity scale on average as compared to those without remittance income.

Using a case study of Zimbabwe and Namibia Crush. J (2017) researched to see the impact of both food and cash remittances to urban and rural security. Findings of the research showed that remittances in Zimbabwe help in times of economic crisis and instability. His findings showed that households with remittances have lower anxiety about not being able to procure sufficient food, higher ability to secure adequate quality food and lower experience of insufficient quantity of food intake than those without remittances. A propensity score matching model was used.

(Bang et al., 2014) had an objective to see the impact of remittances on poverty and income inequality in per capita household expenditure. He performed his study in Kenya. His findings were that, expenditure by poor households is not really affected by earnings from remittances. He used the standard quantile regression analysis. He later on accounted for endogeneity and he found out that remittances do benefit the poor more than the rich.

Adams and Page (2005) did a test on the issue of remittances and poverty in developing countries. The results of their study showed that a 10% increase in Diaspora remittances leads to a 3.5% decrease in the share of poor people on average, thus showing an inverse relationship between the two.

Kiiru (2010), postulated that remittances is a way for those in the third world countries to manage the issue of poverty. By so doing migrants end up sharing their earnings with their loved or families back home. When poverty is reduced food security levels of households are increased.

Gupta et al (2007) did a study on the impact of remittances in Sub Sahara Africa. He obtained his results using three stages least squares estimation method. His results showed that Sub Saharan countries the rate at which remittances reduce poverty is low, in fact poverty increases the level of people moving out rather than remittances.

Owuor (2010) did a research in Kenya and his results showed that items like local vegetables, cassava, green maize, sweet potatoes chicken fruits and ground nuts locally were being remitted from rural areas to towns whereas items like money agricultural and building equipment were
remitted from town to rural areas and also cross borders. This shows that remittances can also be physical.

In Lesotho Gustafsson and Makonnen (1993) conducted a study on the effect of remittances on consumption levels of households. They did a regression analysis using household survey data. Their discoveries showed that remittances increased per capita food consumption by 35% on average among recipient household.

Kassieet., al (2014) in Kenya examined the determinants inequality in household food security in Kenya. Their study was brief and based on 85 villages in of Kenya. The findings of the study were that female headed household are less food secure .9,6% of female headed household suffered chronic food insecurity. Female headed household were 43% food secure against 58% of male headed households. The conclusion of the study was that female headed households are worse off compared to similar male headed households.

Debdulal(2009) studied on whether female headed household are more food insecure than man in Bangladesh.. The data used in the study was of 510 households with more 20000 people. The findings were that only 5,8% of all the household were female headed .in analysis probit model was used and results showed that male headed households had 37% higher probability than female headed household, and the measure was based on the perceptions of the respondent.

Debnath and Selim (, 2009) discovered that decision making among women often increase with education, age and the duration of marriage if the money is sent by spouse or family members. The likelihood of greater economic empowerment and decision making for the household is increased Debnath and Selim, (2009).

Robert. Moffit (2015) researched on the impact of age and gender differentials on low income earners population on food security targeting. His findings showed that level of food insecurity is much greater in low age than in adults, low income earners heading households end up allocating the small portions of food to their children.

Omonaet al. (2007) did a study in Nigeria and his results showed that household food insecurity increases with age, household’s heads above the age of 60 are usually retired, with large household size and low income, thus increasing their likelihood of food insecurity.
Carter et al. (2010) in his research on food security he discovered that incidents of food insecurity are much higher for female headed compared to male headed households. Females are most likely to take care of their extended families and will usually sacrifice their food intake to feed other members of their household when threatened by food insecurity and they are most likely to be single parents than male counterparts.

According to Bracking and Sachikonye (2006) half of the Zimbabweans now rely on remittances for daily expenditures, and an increase in remittances has been recorded in Zimbabwe through informal sources Ochu (1990). These findings are based on a study done using logistic regression.

Knueppelet al. (2009) did a study in Tanzania on food security status. His findings indicated that lower levels of education attainment are directly linked with high food insecurity. 48% of the sampled households were found to be severely food insecure.

Oyalemi (2012) conducted a study in Nigeria and found that household size and food security have an inverse relationship. They are negatively correlated an increase in household size decreases food security levels. Larger households demand more food.

Bashir et al. (2012) did a study in Pakistan on the impact of age of the household and food security and his findings showed that there is a negative relationship between age of the household and food insecurity. A rise in the age of the household in a year was associated with a 4.5% decrease in the likelihood of being food secure. Households with older heads are exposed to chances of food insecurity because they might have retired and more heads to feed.

Bashir et al. (2012) did a study of households in Nigeria on the impact of education and discovered that there is a negative relationship between levels of educational attainment and food security. There is lower chance of food insecurity in households with higher levels of education. This is likely to happen because households would have improved opportunities to sustain active lifestyles for their members. Education enhances better opportunities.

2.3 Gap analysis
With all the studies above having been done there is great need for this study to be done in Zimbabwe mostly. The above literature is made up of studies mostly done in developed countries
outside of Africa thus the need for the study to fill in that gap. The time gaps also call or influence the need of this research to be done in Zimbabwe. Factors like changes in policies, level of economic development where the study was done, the methods used in research locations which the studies were performed and difference in definition of remittances and food security influences the results. This therefore creates a gap and leading to need of this study.

Summary

The above chapter reviewed the theoretical and empirical evidence on the impacts of remittances on food security. The evidence shown by this chapter proves that studies done did not conclude the same, they had mixed views. The chapter to follow explains on the methodology used in this study.
CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction
Chapter three outlines the models that were used to come up with the results and the description of the research. It explains the instruments to be used and how the data that will be analyzed or gathered and also presented. The tools examined will the researcher in explaining the relationship between food security and remittances and other repressors or explanatory variables. Empirical evidence reported in this chapter is based on cross sectional data from a survey.

3.2 Research design
According to Brymen (2003) research design is a structure that guides the execution of research method and the analysis of the subsequent data. Research design attends to the research problem using the available data. It explains how the study came about. This study tries to look into the impact of remittances on food security.

3.3 Theoretical model.
The altruistic theory is a theory which explains the motives for remitting. Altruism is an important purpose for sending money to your loved ones (Lucas and Stark, 1985). Altruism can be said to be pure altruism were one gives not as a duty or to benefit but out of love. The remitter derives his or her utility from the consumption level of those left at home (Becker, 1974). The utility is expressed as a weighted average. As migrant income increase so does the altruistic transfer and the degree of altruism and the same happens when there is a decrease in the income of the remitter. Therefore the altruistic theory adds a variable remittance to this study.

3.4 Empirical model specification
The main purpose of this study is to see if diaspora remittance increases the food security in Zimbabwe. Most of the studies suggest an inverse relationship between diaspora remittances and hunger (food security). Our assumption is that diaspora remittances increase food security in home of the recipient. We therefore test this hypothesis by stating a model of household food security.
3.5 Econometric model

Objective one of this study is to see the effect of remittances on household food security. Therefore this study defines the following empirical model and since the outcome variable is dichotomous this study will use the logit model.

\[
Y = \text{Food Security}, \quad \beta_0 = \text{Constant}, \beta_1, \ldots, \beta_z = \text{explanatory variables}, \quad U = \text{Error term}
\]

\[
FS = \beta_0 + \beta_1 R + \beta_2 G + \beta_3 A + \beta_4 Ed + \beta_5 S + \beta_6 MS + \beta_7 P + \mu \quad (1)
\]

Where FS denotes food security

\( R = \text{Diaspora remittances}, \)

\( G = \text{gender of the head of household}, \)

\( A = \text{age of the head of household}, \)

\( Ed = \text{highest education level}, \)

\( S = \text{Size of the household}, \)

\( MS = \text{marital status}, \)

\( P = \text{province} \)

\( u = \text{the error term}. \)

Thus food security is a function of these variables as shown below in equation (2)

\[
\text{Thus } FS = f(R, G, A, Ed, S, MS, P) \quad (2)
\]

The second objective of this study is to see the impact of gender heterogeneity to remittances on food security of households.

\[
FS = \beta_0 + \text{Remittances} + u \quad (3)
\]

The second objective of this study is to see the impact of gender heterogeneity to remittances on food security. The dummy variable gender and remittances are then interacted.

Given the above factors \( FS = \beta_0 + \beta_2 \text{ gender and remittances} \ldots, \beta_z + \mu \)
Where $\beta_2$ is a differential intercept dummy and it gives the difference in Food security between males and females, this is to determine the impact of gender heterogeneity in the impact of remittances on food security.

$$E(FS/Gndr = 1, R) = \beta_0 + \beta_1 R + \beta_2 G + \beta_3 Age + \beta_4 Edu + \beta_5 S + \beta_6 MS + \beta_7 P + \beta_8 Gndr R + \mu$$

### 3.6 Logit model

Regression analysis studies the relationship between the dependant variable and the independent variables (Gujarati and Porter 2010). (Baddely 2009) allude that logistic regression is used when dependant variable is has two possible outcomes zero or one. A logistic regression estimates the odds or chances of an occurrence of an event and predicts the effects of the explanatory variables on these odds (O Connell, 2006). This study will use the logit model, due to the nature of the outcome variable which is dichotomous in nature in the form below.

$$y_i = X_i + u_i$$  \hspace{1cm} (5)

Where $y_i$ is a dichotomous outcome standing for food security, $X$ is a vector of exogenous variables.

The dichotomous variable $y$ is a discrete (0/1) response variable satisfy

$y_i = 1$ if Yes

$0$ if otherwise

$$y_i = y_i > 0$$

$$y_i = 0$$ if otherwise  \hspace{1cm} (7)

The probability is thus given by

$$FS = \beta_0 + \beta_1 Remittances + \beta_2 gender. remittances + \ldots \ldots \ldots \beta z + \mu$$
\[ Pr (y_i = 1/x_i) = Pr(y_i * X_i) \]  \hspace{1cm} (8)

Substitute equation (6) into equation (8)

\[ Pr = (y_i = 1/X_i) = Pr(Xi\beta + ui > 0/X_i) = F(Xi \beta) \]  \hspace{1cm} (9)

With this research’s objectives the food security model is specified as follows.

\[ Pr (FS = 1/X) = F( R, Gndr, HS, Age, P, MS, Edu) \]  \hspace{1cm} (10)

Equation (10) is a logit model. As shown in the equation the probability of household food security given observed characteristics X is given by a function F. Assuming that the error term follows cumulative logistic distribution, F therefore becomes a cumulative distribution function for the logit model. Thus equation (10) is a logit model.

3.7 Justification of variables

3.7.1 Outcome Variable: Food security
The dependent variable of this study is food security. The outcome variable is being measured through hunger a life challenge how often a households skips meals. The researcher recoded the to food security and assigned the yes if the household skipped meals and no if they did not therefore data was coded 0 for “no” and 1 for “yes”. The dependent variable is dichotomous in nature and is determined by remittance, gender, age, education level, marital status, province, and household size. The indicators of food security in this study life challenging of how many times a household skipped a meal.

1 = Always: 10 times or more

2 = 5-9 times

3 = Sometimes 3-4 times

4 = Rarely 1-2 times

5 = Never

For the regression purpose 1-4 were re-coded as No and 5 was re-coded as Yes in this study. Yes for food secure represented by 1 and 0 for no, thus the outcome variable is dichotomous.
3.7.2 Independent variables

3.7.2. a Remittances (R)
In this study remittances are the remittances received by the household. Remittance is a dummy variable 1 for household receiving remittances and 0 otherwise. The study is on how these remittances affect the food security in Zimbabwe. A household that receives remittances are expected to be food secure because they earn additional income to cover their basic needs.

3.7.2. b Gender (GNDR)
Gender in this study is showing the difference in sex of head of household. It’s a nominal categorical variable and it shows if the head of household is male or female. Several studies conclude that female headed households are mostly affected by food insecurity than male headed household. (INSTRAW, 2008) did a research in Philippines about gender, remittances and economic development and discovered that remittances and food security have a positive relationship. Gender is a dummy variable and it takes value of 1 if the household head is male and 0 otherwise. Gender of the head of household is a significant factor which determines the food security of a household. Female headed household are vulnerable to food insecurity and they are less secure because of lack of access to assets and information.

3.7.2. c Age (AGE)
Age is a numerical variable. According to Oxford University (2017) age is the length of time that a one has lived or existed. Age is said to have an impact on household food security. Kassie et al (2012) observed that there is an inverse relationship between age and food security of a household. Cook et., al (2006) s findings showed that children were unsecure and that food security vary by means of age and gender. Age of head of household is an important factor explaining the level of food security. Food security levels are expected to increase with age and then fall as the person ages, this is because head of household will no longer be economically active. In this study age is a continuous variable and measured in years.

3.7.2. d Education (EDU)
Oxford (2017) defines education as the process of receiving or giving systematic instruction, especially at a school or university. Education is an ordinal variable. In this study its measured in levels were those with early child development (ECD) =1, grade 1-7 =2, form 1-6=3, diplomatic certificate after primary =4, diplomatic certificate after secondary =5, graduate /post graduate =6,
Education is significant in determining food security. Food security levels of a household are expected to increase with the level of education.

3.7.2. Household size (HS)
An economic unit which is defined for the purpose of census of population as a single person living alone or a group of people voluntarily living together, having meals prepared together and benefiting from housekeeping shared in common, Vinod (2012). Obamiro et al (2003) did a study which showed that large households are more to be food insecure than small households. According to Oyalemi (2012) family size has effect on food security, the bigger the family the more the food insecure they are. This is a significant determinant of household food security. The level of education determines whether an individual has better access to job opportunities in the labor market and it’s described as social capital Babatunde et al (2007).

3.7.2. Marital status (MS)
Is the situation of being married or not. The variable takes the value of 1 when never married, 2 when married or living together or cohabiting, 3 when divorced or separated and 4 when widowed. Marital status is an important factor in determining the household food security. Widows and widowers headed households are more likely to be food insecure because they will be lacking spouse support. Households headed with both a head and a spouse has greater chances of avoiding food insecurity.

3.7.2. Province (P)
A province is a demographic division of a country; it’s found within a country Zimbabwe has 8 provinces. Province is an important factor in determining food security of a country. In Matebeleland North 28, 5% of households lack sufficient quantity of nutritious and basic food. This puts this province on top of the rankings in Zimbabwe with Mashonaland East being the most food secure province according to (ZimVAC, 2015).

3.7.3. Error term
It is the remainder term. It represents variables that were left from the equation (David and Freedman, 2005).

3.8 Justification of the packages used
SPSS package will be used to estimate the equation. SPSS provide values for the existence or non existences of the problems of multicollinearity. The package also gives descriptive statistics.
which show the summary of statistical properties. SPSS provides the Pseudo R squared (Nagelkerke) $R^2$ and Cox-Snell measures of logistic regression. Nagelkerke is an adjusted mirror of the Cox –Snell. It explains the variation in Food security. It explains how well the explanatory variables explain the outcome variable in logistic regression models.

3.9 Estimation procedures
Due to the weakness of the Ordinary Least Squares (OLS) model estimation which gives biased estimates, estimates probability outside range, being greater than 1 or less than 0. This study employed the maximum likelihood estimation (MLE) method to estimate the unknown coefficients of the explanatory variables. It’s a method which uses the probability theory specifically the normal distribution function (Gujarati 2004). It gives a unified approach. This method is used to estimate parameters of statistical model given observations. MLE is a method of estimating dichotomous or categorical outcome variables. Since the dependant variable is dichotomous the researcher found it appropriate to use the MLE way of estimating the results. MLE works by estimating area under the normal distribution curve which falls under the acceptance region. This is a large sample method and the estimated standard errors are asymptotic. The variance of MLE estimator is biased downwards, with the increase in sample the bias factor tends to be zero (Maddala 1992). Therefore the estimated variance tends to be unbiased in MLE method.

Assumptions of the model

- Error term is stochastic
- The model is correctly specified
- $\mu_1$ follows a normal distribution

3.10 Type of data
This research used secondary data from a survey done. Observations were observed in the ten provinces of Zimbabwe. Data type is cross sectional data.

3.11 Data analysis and analysis procedures
According to Shamoo and Renik (2003) data analysis as a systematic way of describing, illustrating and evaluating data using different techniques. It gives meaning and significance to data. It is used to discover useful information, conclusions and suggestions.
3.12 Model diagnostic tests
Diagnostic tests are tests done in economics in measuring the validity or checks of a model in a number of ways (Gujarati, 2004). The study will test on multicollinearity and the goodness of fit. These tests will help on meeting the assumptions of logit estimation. Since the model follows a logistic distribution. For this reason in this research some diagnostic tests used in OLS like heteroskedasticity are of no use in this study.

3.12.1 Multicollinearity
A multicollinearity test will be carried out. It tests if there is correlation between two or more independent variables. A correlation matrix will be drawn and if the correlation matrix is 0,8 hence there is multicollinearity. If the independent variables are correlated it becomes difficult to separate effects of the independent variables on the outcome variable (Maddala, 1992). It is diagnosed through high p values and low t ratios.

H0: There is no multicollinearity among variables
H1: There is multicollinearity among variables.

3.12.2 Pseudo R squared
Pseudo $R^2$ is used in explaining the variations it’s a goodness of fit measure .Its commonly used when testing hypothesis .Pseudo is a combination of any $R^2$ between McFadden, Cox and Snell and Nagelkerke .The Nagelkerke is just a mirror of Cox and Snell $R^2$ in a more modified way Gujarati (2004). The value should range from 0-1 and it more preferably or encouraged to use the Nagelkerke.

Summary
Chapter three gave an elaboration on the methodology used in the research. The chapter talked about the research design, gave empirical model specifications and also justified the use of variables and packages. Chapter four will concentrate on data presentation estimating of the data, presenting and interpreting the data.
CHAPTER 4

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction
This chapter outlines the findings and results of the study. It’s going to present results of data analysis. The main procedure used to answer the research questions is the Logistics Regression analysis using software called SPSS (Version 20) packages. Statistical and economical interpretations of the results will be discussed. There will be use of tables and pictures in the presentation of results. The main aim of the study is to determine the existence of the relationship between food security, remittances, gender, age, education level, size, province, marital status of household. Finally a brief summary of the study findings concludes the chapter.

4.1 Descriptive statistics
Table 1: Descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foodsecurity</td>
<td>0</td>
<td>1</td>
<td>.63</td>
<td>.484</td>
<td>.519</td>
<td>-1.731</td>
</tr>
<tr>
<td>Remittances</td>
<td>0</td>
<td>1</td>
<td>.58</td>
<td>.493</td>
<td>-.345</td>
<td>-1.881</td>
</tr>
<tr>
<td>Gender</td>
<td>0</td>
<td>1</td>
<td>1.17</td>
<td>0.83</td>
<td>-1.779</td>
<td>1.163</td>
</tr>
<tr>
<td>Marital status</td>
<td>1</td>
<td>5</td>
<td>2.45</td>
<td>1.047</td>
<td>1.682</td>
<td>1.500</td>
</tr>
<tr>
<td>Education</td>
<td>1</td>
<td>7</td>
<td>2.92</td>
<td>1.169</td>
<td>1.873</td>
<td>3.782</td>
</tr>
<tr>
<td>Size</td>
<td>1</td>
<td>10</td>
<td>4.79</td>
<td>2.086</td>
<td>.357</td>
<td>-.332</td>
</tr>
<tr>
<td>Province</td>
<td>0</td>
<td>9</td>
<td>4.75</td>
<td>2.959</td>
<td>.034</td>
<td>-1.410</td>
</tr>
<tr>
<td>Age</td>
<td>20</td>
<td>98</td>
<td>47.15</td>
<td>16.346</td>
<td>.853</td>
<td>.453</td>
</tr>
</tbody>
</table>

Source SPSS 20
The table above shows the descriptive statistics of the variables used in the model. It shows the minimum, maximum, mean, standard deviation, skewness, kurtosis. Where, FOOD SECURITY is the dependent variable. From the table above the dependent variable has maximum value 1, minimum value of 0 and mean of 0.63 this is due to a standard deviation of 0.484. From the table we can see that all other independent variables are positively skewed except for remittances with -0.345 whereas food security is negatively skewed. GENDER of the household head has the lowest standard deviation of 0.374 indicating that there is high reliability in its contribution towards explaining the changes in food security of a household. Age has the largest statistics due to the maximum age unknown coded as 98.

4.2 Diagnostic test

Table 2: Correlation matrix

<table>
<thead>
<tr>
<th></th>
<th>Remittances</th>
<th>Gender</th>
<th>Age</th>
<th>Marital status</th>
<th>Education</th>
<th>Province</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remittances</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.008</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.013</td>
<td>-0.186</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td>0.011</td>
<td>-0.677</td>
<td>0.247</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>0.109</td>
<td>-0.061</td>
<td>-0.024</td>
<td>0.033</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Province</td>
<td>0.081</td>
<td>-0.054</td>
<td>-0.060</td>
<td>-0.050</td>
<td>0.063</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>-0.085</td>
<td>0.027</td>
<td>0.273</td>
<td>0.061</td>
<td>-0.039</td>
<td>-0.058</td>
<td>1</td>
</tr>
</tbody>
</table>

Source SPSS 20

Correlations analysis between the seven independent variables. If variables are above 0.8 it means we have to correct for multicollinearity (Gujarati, 2004). The above table illustrate that the model is not suffering from multicollinearity all the variables are below 0.8 so there is no need to correct for multicollinearity.
4.3 **Significance of the model**

The Pseudo $R^2$ shows the explained variation in the dependent variable based on the model which ranges from 41% - 55%. Pseudo R square (Nagelkerke) estimates the explained variation by the variables Gujrati, 2004). Therefore in this study the independent variables are appropriate in explaining Food Security. NB* not all variables were used from the data set.

**Table 3: Pseudo $R^2$**

<table>
<thead>
<tr>
<th>Step</th>
<th>-2 Log likelihood</th>
<th>Cox &amp; Snell R Square</th>
<th>Nagelkerke R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3871623.787</td>
<td>.041</td>
<td>.055</td>
</tr>
</tbody>
</table>

Source SPSS 20

4.4 **Estimation of results**

The dependent variable is in dichotomous form and the results of the analysis are shown below. The analysis was done through logistic regression. Since the correlation test does not imply the effect of one variable to another.
<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>Df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remittances</td>
<td>.473</td>
<td>.003</td>
<td>33360.827</td>
<td>1</td>
<td>0.000</td>
<td>1.604</td>
</tr>
<tr>
<td>Gender</td>
<td>-.086</td>
<td>.005</td>
<td>288.292</td>
<td>1</td>
<td>.000</td>
<td>.918</td>
</tr>
<tr>
<td>Age</td>
<td>-.001</td>
<td>.000</td>
<td>39.052</td>
<td>1</td>
<td>.000</td>
<td>.999</td>
</tr>
<tr>
<td>Married</td>
<td>.453</td>
<td>.008</td>
<td>3198.395</td>
<td>1</td>
<td>0.000</td>
<td>1.573</td>
</tr>
<tr>
<td>Cohabiting</td>
<td>.352</td>
<td>.006</td>
<td>3774.700</td>
<td>1</td>
<td>0.000</td>
<td>1.422</td>
</tr>
<tr>
<td>Widowed</td>
<td>-.242</td>
<td>.008</td>
<td>918.109</td>
<td>1</td>
<td>.000</td>
<td>.785</td>
</tr>
<tr>
<td>Divorced</td>
<td>.225</td>
<td>.008</td>
<td>859.166</td>
<td>1</td>
<td>.000</td>
<td>1.253</td>
</tr>
<tr>
<td>Grade 1-7</td>
<td>.516</td>
<td>.015</td>
<td>1135.309</td>
<td>1</td>
<td>.000</td>
<td>1.676</td>
</tr>
<tr>
<td>Form 1-6</td>
<td>.670</td>
<td>.011</td>
<td>3424.579</td>
<td>1</td>
<td>0.000</td>
<td>1.954</td>
</tr>
<tr>
<td>Diploma after primary</td>
<td>1.258</td>
<td>.011</td>
<td>12182.109</td>
<td>1</td>
<td>0.000</td>
<td>3.519</td>
</tr>
<tr>
<td>Diploma after secondary</td>
<td>g.786</td>
<td>.017</td>
<td>2251.088</td>
<td>1</td>
<td>0.000</td>
<td>2.195</td>
</tr>
<tr>
<td>Graduate /post grad</td>
<td>2.074</td>
<td>.013</td>
<td>26275.155</td>
<td>1</td>
<td>0.000</td>
<td>7.957</td>
</tr>
<tr>
<td>None</td>
<td>1.914</td>
<td>.015</td>
<td>16734.622</td>
<td>1</td>
<td>0.000</td>
<td>6.778</td>
</tr>
<tr>
<td>Size</td>
<td>-.052</td>
<td>.001</td>
<td>6123.336</td>
<td>1</td>
<td>0.000</td>
<td>.949</td>
</tr>
<tr>
<td>Manicaland</td>
<td>-.340</td>
<td>.006</td>
<td>3539.154</td>
<td>1</td>
<td>0.000</td>
<td>.712</td>
</tr>
<tr>
<td>Mash Central</td>
<td>-.227</td>
<td>.005</td>
<td>2372.148</td>
<td>1</td>
<td>0.000</td>
<td>.797</td>
</tr>
<tr>
<td>Mash east</td>
<td>-.271</td>
<td>.005</td>
<td>2551.207</td>
<td>1</td>
<td>0.000</td>
<td>.762</td>
</tr>
<tr>
<td>Mash west</td>
<td>.012</td>
<td>.005</td>
<td>7.421</td>
<td>1</td>
<td>.006</td>
<td>1.013</td>
</tr>
<tr>
<td>Mat north</td>
<td>.045</td>
<td>.005</td>
<td>87.671</td>
<td>1</td>
<td>.000</td>
<td>1.046</td>
</tr>
<tr>
<td>Mat south</td>
<td>-.236</td>
<td>.006</td>
<td>1326.150</td>
<td>1</td>
<td>.000</td>
<td>.790</td>
</tr>
<tr>
<td>Midlands</td>
<td>-.352</td>
<td>.006</td>
<td>2981.055</td>
<td>1</td>
<td>0.000</td>
<td>.703</td>
</tr>
<tr>
<td>Masvingo</td>
<td>-.421</td>
<td>.005</td>
<td>7250.232</td>
<td>1</td>
<td>0.000</td>
<td>.657</td>
</tr>
<tr>
<td>Harare</td>
<td>-.457</td>
<td>.005</td>
<td>9041.395</td>
<td>1</td>
<td>0.000</td>
<td>.633</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.411</td>
<td>.014</td>
<td>10483.911</td>
<td>1</td>
<td>0.000</td>
<td>.244</td>
</tr>
</tbody>
</table>

Source: SPSS 20
Table 5: Regression analysis for objective 2(equation 4)

<table>
<thead>
<tr>
<th>Variables in the Equation</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>Df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genrem</td>
<td>.436</td>
<td>.002</td>
<td>43296.536</td>
<td>1</td>
<td>0.000</td>
<td>1.547</td>
</tr>
<tr>
<td>AGE</td>
<td>-.001</td>
<td>.000</td>
<td>51.385</td>
<td>1</td>
<td>.000</td>
<td>.999</td>
</tr>
<tr>
<td>Married</td>
<td>.576</td>
<td>.008</td>
<td>5578.169</td>
<td>1</td>
<td>0.000</td>
<td>1.780</td>
</tr>
<tr>
<td>Cohabiting</td>
<td>.498</td>
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Source :SPSS 20
Male headed households receiving remittances are 1,547 more likely to be food secure than their counterparts. If remittances increase by 0.436 average food security levels for male headed household increase more than those of females. Since, most households are male headed.

4.5 Results interpretation and Discussions

4.5.1 Remittances
A positive unit change in remittances results in 0.473 changes in the food security. The results also show that households that receive remittances are 1,604 more likely to be food secure than those not receiving. Regmi (2015) did a study on the impact of remittances on food security in Bangladesh and his results indicated that remittances play an important role in improving food security of a household, they affected food security positively. And also Babatunde and Martinetti (2010), did a study on the impact of remittances on food security focusing on calories and the outcome showed that the impact affected calories positively yet no impact on the quality of diet. Findings from other studies support the results obtained in this study that an increase in remittances will reduce household vulnerability to food security. This is also supported by the theory of altruism which says remittances improve the wellbeing of households in recipient which then maximises the utility function of the migrant.

4.5.2 Gender
Male was taken as the base. From the frequency statistics it can be seen that most household were male headed. Results of this study show that male headed households are less likely to be food secure than their counterparts by 0.918. These results however, do not conform to the expectations that male headed are more secure than female. It’s in contrast to those of a study done in Kenya on what determines gender inequality in household food security by Kassie et al (2014).

4.5.3 Age
Age of the household was taken as a control variable as this definitely affects food security. The least household was headed by a 20 year old. A household led by an uneconomic person is food insecure this conforms to the study done by Moffit (2015) on age and gender differences in food security in a low income population of Australia. Age of the head of household is statistically significant. A study done in Pakistan by Bashir et al (2010) reported a negative relationship between age of the household and food insecurity. In this study age tends to negatively influence
household food security. This is because young people are economically active than older people and can operate in challenging jobs within the labor market. Food security levels of a household decreases when the household is headed by elderly people this maybe due to reduction in income.

4.5.4 Education
Households with education are more likely to be food secure than those with no education. Households headed by post graduates have the highest chances of being food secure of 7,957. ECD was taken as the base and all categories were less likely to be food insecure compared to those with ECD except those with no education at all. Most of the household are headed by people who are educated in Zimbabwe. This conforms to a study done in Kenya on the effect of education on household food security in two informal urban settlements by M Mutsiya and M Ngwareet, al (2016). Their results showed that education helps in the reduction of food insecurity in the long run and that education reduces the probability of food insecurity. Similar results were produced by Knueppel (2009) in Tanzania which indicated that lower education lower educational levels are directly related to high food insecurity.

4.5.5 Marital status
Never been married was taken as the base. All marriage categories were food secure as shown by the odds ratios compared to those who have never been married. Widowed headed households have fewer chances 0,785 of being food secure than those that have never been married. From the results they prove to have the highest chances than any other category. This conforms to the results of the study done by Oyalemi (2012) in Nigeria, were widowed headed households are prone to food insecurity.

4.5.6 Household size
The size of the household contributes to food security. The maximum number of family in households was 10. A unit change in household size results in -0, 52 changes in the food security of the household. Large households have more chances of being food insecure. The results conform to those of a study done in Nigeria on the effect of family size on household food security by Oyalemi A 2012) his results showed that a large household size results to less quantity of food.
4.5.7 Province
Bulawayo province was taken as base. Households in Midlands province are less likely to be food secure than households in Bulawayo by 29.7%. The results show that Matebeleland North and Mashonaland West are the only two provinces with $\text{Exp (B)}$ or odd ratios greater than 1. Results of this study do not conform to those of ZIMVAC report (2015) which stated that provinces in Mashonaland are more secure than those in Matebeleland. Harare is the most food insecure province of them all.

Summary

This chapter outlines the results of the study for the specified time. The following and final chapter will give a summary of the whole study; suggest recommendations and suggestions for further study.
CHAPTER 5

SUMMARY CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction
This research was on the impact of remittances on food security of households in Zimbabwe. The need to do this study was motivated by the fact that food insecurity is a problem of concern in Zimbabwe. So this chapter gives a precise summary and concludes the study and as well as suggestions for further study. It discusses on the summary of the research, conclusions considering the objectives of the study and policy recommendations to the policy makers in Zimbabwe to help increase food security.

5.2 Summary
The gist of this research was to determine on the impact of remittances on food security in Zimbabwe. The study was provoked by the food and nutrition shortages in Zimbabwe. Data analysis was done using SPSS version 20. The Maximum likelihood estimation was used for the estimation of the variables. This research has contributed literature on how food security is affected by variations in remittances, gender, household size, marital status, province age, and highest education level of household. The findings of the study shows that food security and remittances are positively related meaning remittances show signs of positive effects on food security. From the findings remittances had a positive impact as supported by the Developmentalist theory and shown from pervious empirical studies which suggested a positive relationship. In the developmentalist theory it is suggested an increase in remittances has a positive impact on food security in developing countries. A research done in Nigeria by Babatunde R.O (2010) suggested remittances had a positive effect on food security considering the diet of households. Another study done by Crush (2017) in Zimbabwe discovered that remittances had a positive impact on food security rural and urban households in Zimbabwe. Remittances reduce the level of food insecurity in Zimbabwe as shown by the results.

Gender of the head of household negatively affects food security of Zimbabwean households in this study these variables have an inverse relationship. It was observed that 83% households were headed by men. This however does not conform to the findings of other empirical studies.
done neither does it meet expected results, of female headed households being less secure than male headed. The reason maybe males prioritize investment and leisure. A man can afford to go to the beer hall whilst the family is skipping meals.

The study also found that household size had a significant impact on food security. From the study household size was found to be significant. Evidence from the study showed that the larger the size of the family the more the food insecurity. This goes in line with a brief study done by Oyalemi (2012) on the effect of family size on household food security in a state of Nigeria. Majority of the households had 5-8 people. In this study the largest household had 10 people.

Evidence from this study showed a positive relationship between education level and food security. The variable is significantly associated with household educational attainment. Households with higher educational attainment was food secure and those with none were highly food insecure. A study done by Mutsiyaet.,al (2016) confirms these results. Their study showed that households with low educational attainment were more likely food insecure than those with at least basic education. Bashir et al. (2012) reported that the educational attainment of the head of household has a positive effect on household food security.

5.3 Conclusions
The study wanted to see the relationship between food security, remittances, household size, marital status, gender, age of head of household, education level, and province. It was also found that an increase in remittances reduces the levels of food insecurity in a household meaning household with migrants go without basic necessities less often. Since remittances play a vital function in improving food security. Remittances have reduced vulnerability to hunger in both rural and urban households. There are other significant variables in the model were like gender also contribute to the food security of a household. It was found that male headed households receiving remittances are more likely to be food secure than females. They have helped in catering of basic needs of households in Zimbabwe. It was also found that an increase in household size leads to food insecurity of a household. Showing that larger families are associated with a negative status of food security, they are more likely to be food insecure. The larger the family size the less the share of remittances.
5.4 Recommendations

- Government should ensure that remitting channels are accommodating for both parties the recipient and the sender to feel comfortable. The cost of remitting should be reduced as it is acting as a stumbling block for monies to be sent. This will encourage remitting.
- The policy makers should include the role of women in food security when crafting their agendas. Women and the society as a whole should be empowered so as to avoid cases of female being constrained by the society.
- Those in policy positions should encourage women clubs or associations. This can be done by providing financial support and trainings as they can support female headed households by providing information and helping them in getting inputs and credit facilities.
- Government and other stakeholders should encourage family planning. Women should be educated on the importance of few children. Family planning methods and equipments should be readily available to everyone even outside towns and cities.
- The Zimbabwean government should plan before hand for events like droughts. It can work closely with academics and other research institutions and venture into programs like disaster management programs to tackle hunger and uncertainties.
- The Zimbabwean government should provide more infrastructure building more storage and improve conditions of the current facilities like Grain Marketing Board (GMB) this reduces stress on its citizens during disasters like drought.

5.5 Suggestions for further research

The results here should by far not be the last word on subject. Studies on how changes in remittances, gender, household size, marital status, province, education level and age should be done in other developing countries besides Zimbabwe. All continents should be targeted for this will help in deriving information on how these factors explain food security. Further study can also be done to determine other factors which affect food security but not involved in this study. Other determinants can be used in determining factors that affect food security other than the ones used in this study. Since findings of this study cannot be viewed as exhaustive but as a stimulant for further research.
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