Impact of Migration on Welfare of Migrant Sending Households in Selected Rural Areas of Zimbabwe

By

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COMPULSORY DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works, of other people has been attributed, and has been cited and referenced.

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Abstract

The New Economics of Labour Migration theory, recognizes family participation in migration decisions as a strategy for moving out of poverty, thus signaling potential welfare linkages between migrants and family members left behind. The current study investigates the impact of migration on welfare of migrant sending households in rural Zimbabwe using cross-sectional data. The study employed a Counterfactual approach and utilized two stage Heckman selection model to control for selection bias. The results indicated that on average, migration impacts household welfare positively but the welfare gains are not evenly distributed among households. Overall, the welfare of households with migrants would have been 5 percentage points lower if migrant members had stayed at home. Based on the findings, the main recommendation is that policy makers need to consider the removal of *de facto* and *de jure* migration restrictions.

Key words: Heckman model, Migration, Counterfactual approach

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Dedication

I dedicate this thesis to my mom, Revai Bashu

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List of Acronyms

CASS	Centre for Applied Social Sciences
DFID	Department for International Development
MOOP	Migrating Out of Poverty
OLS	Ordinary Least Squares
UK	United Kingdom
UNDESA	United Nations Department of Economic and Social Affairs
USD	United States Dollar
ZIMSTAT	Zimbabwe National Statistics Agency

CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.0 Introduction

Incomes are volatile in poor communities and sometimes households live on less than a dollar per day. To cushion themselves from volatile income, poor families resort to borrowing from friends and job hunting (Rutherford and Chatterjee, 2019). Establishing a business enterprise is also among alternatives adopted by family members in trying to reduce financial vulnerability. However, the business enterprise option is impeded by lack of capital, so household units end up considering migration as an indirect strategy to escape out of poverty (Shonchoy, 2011).

There is currently an ongoing debate on migration and welfare nexus. In scrutinizing this subject, researchers looked at issues such as impact of migration on destination communities, changes in wellbeing of migrants after migration and changes in standards of living of migrant sending households. Different approaches and datasets were used to establish the impact of migration on economic performance and the main results are that it can be positive or negative. The studies carried out on migration and welfare nexus in different countries employed qualitative and quantitative approaches using data ranging from self-reported impact assessments, micro panels to household surveys (Czaika and Parsons, 2018). The current study adds to the existing debate through exploring whether having a migrant in the household generate welfare gains. In addition, it also examine how welfare changes are distributed among different households.

1.1 Background of the study

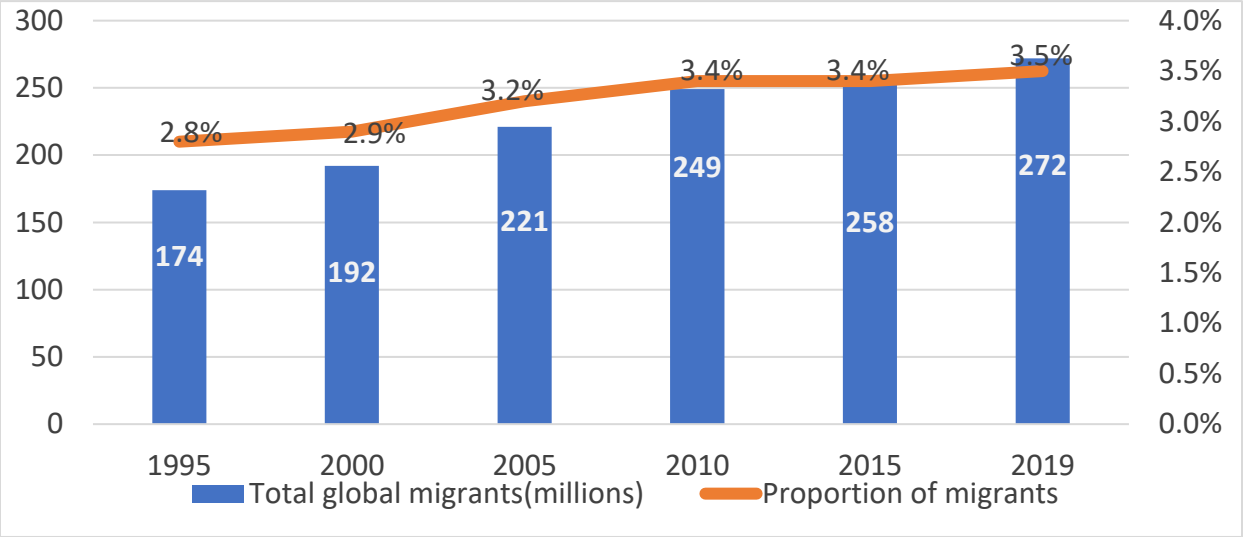
The number of people migrating from one region to another has been growing since 1990. About one billion people worldwide work and live in regions which are not their country of origin (Démurger, 2015). Globally, international migrants were around 272 million (3.5% of world population) in 2019, with labour migrants estimated to be about two-thirds of the total migrants[1]. Of the 272 million international migrants, 52% were men while 48% were women and 74% of international migrants comprised of an economically active group aged between 20 and 64. This

[1] United Nations Department of Economic and Social Affairs , 2019a

mass exodus of economically active people might have severe consequences to the source country's welfare and development.

The International Organization for Migration report (2020) shows that there is a positive trend in the size of international migrant population in the world and migrant population to the world's population proportion (Figure 1).

Figure 1. Total and proportion of international migrants globally.



Source: UNDESA, 2019a

Figure 1 shows that about 272 million people were living foreign land in 2019. Thus, 98 million more migrants than in the year 1995. There was a gradual increase in international migrants to the world's population proportion over the period 1995 to 2019.

Zimbabwe in particular also witnessed an increased internal and international migration over the past decades and the process is still currently ongoing. Internal and international migration in Zimbabwe come in phases. First phase was soon after independence in 1980 when Zimbabwe witnessed mass exodus of white people who could not adjust to political circumstances. Second phase was during the economic liberalisation period (between 1991 and 1995) which brought hardships resulting in skilled personnel such as doctors, teachers and nurses leaving Zimbabwe searching for better opportunities. The third phase was during hyperinflationary period (between February 2007 and February 2009) which caused a surge in poverty levels pushing households to resort to migration as a survival strategy (Dumba and Chirisa, 2010). From 2010 emigration

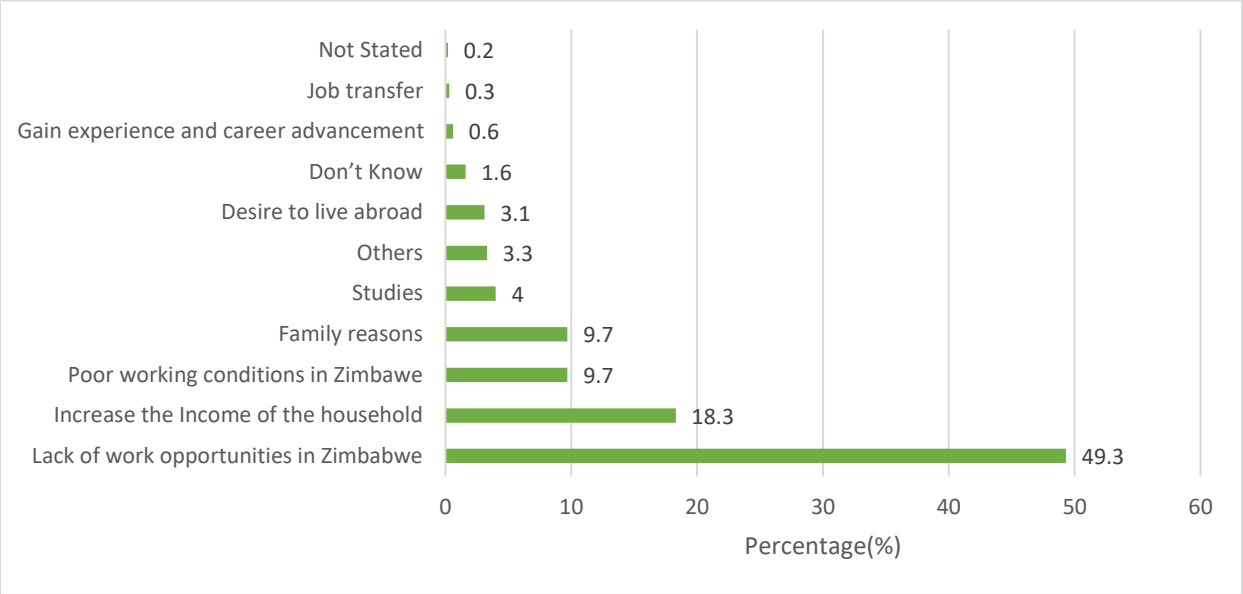
trajectory continued to be on the rise because of governance crisis in Zimbabwe (Fukuyama, 2013). The top five destination countries of Zimbabwean migrants are South Africa, United Kingdom, Malawi, Australia and Botswana (Chereni and Bongo, 2015).

The actual number of Zimbabweans who migrated out of the country remains unknown because some people use illegal routes into foreign land. However, Zimbabweans living and working in the diaspora in 2014 were estimated to be between 2 to 3 million people (Dzingirai *et al*., 2015). Of this estimate, more than one and half million people lived in South Africa.

The caliber of migrants moving out of Zimbabwe can be classified into two groups. First group which is the largest comprise of mostly unskilled workers who are choosing nearby destinations such as South Africa and Botswana. These migrants are a "survival group" escaping persecution and a break down in livelihood in the country. As described Crush, Chikanda and Tawodzera (2012), this group do menial jobs such as domestic workers, farm labourers and casual workers for relatively short period of time. The second group, consist of mostly professionals which include healthcare workers, accountants and lawyers working in the United Kingdom, New Zealand, Australia and Namibia (Anich *et al*., 2014). In most cases the migrants leave family members such as women, children and the elderly behind because of rigid migration policies and uncertain conditions in destination countries.

According to Dzingirai *et al*. (2015) the main reason for internal migration and mass exodus of people from Zimbabwe is poverty. Migration ease poverty levels when economically active members of the household secure employment after migrating and send part of the income home. The 2014 Labour Force and Child Labour Survey conducted by Zimbabwe National Statistics Agency (ZIMSTAT) uncovered some of the reasons why people migrate at household level. These are illustrated in Figure 2 which shows distribution of emigrants by reason of migration.

Figure 2. Distribution of emigrants by migration reasons in Zimbabwe, 2014



Source: ZIMSTAT, 2014

In Figure 2, the top three reasons pushing people to migrate out of Zimbabwe are lack of work opportunities, desire to increase income of the household and poor working conditions. The reasons support that migration is a useful strategy used by families in constructing a secure livelihood outside the restrictive conditions. Thus, migration becomes a way of overcoming the limitations imposed on households by local economic crisis.

Remittances can help alleviate poverty especially if used towards economic production. In many sending communities' remittances are used to ensure food security and to sponsor activities such as funerals, marriage ceremonies and the remainder is normally directed towards purchase of land and livestock (Dzingirai *et al.*,2015). This shows that migration of a member influence the welfare of families left behind, but the challenge is in demonstrating the effects empirically. Therefore, the current study focuses on the impact of both international and internal migration on welfare of migrant sending households in rural Zimbabwe.

1.2 Problem Statement

The migration impact on welfare of members left at home has been debated for long. Optimists are of the view that migration economically benefits members of the family left behind via remittances which can increase liquidity and expand the budget set, thus, increasing household

consumption expenditure. This view was reinforced by various studies (Adams and Page, 2005; Lokshin *et al*., 2010; Anderson, 2012) which found out that migration of a member increases the welfare of migrant sending households. However, pessimists hold the view that splitting up of families through either internal or international migration carries multiple adverse effects on labour supply responses, family health, education and social status of the family members remaining behind. This view was supported by Lipton (1980) who found out that physical absence of a household head leads to poor diets in the family and increased psychological problems, thus making members left behind worse off. The mixed evidence and conflicting views shows that migration impact on welfare of families left behind remains an open subject which needs further interrogation. Hence, the current study investigates the impact of migration on welfare of family members left at home in rural Zimbabwe.

1.3 Research Objectives

The main objective of this study is to examine whether migration improves welfare of migrant-sending households in rural Zimbabwe.

Specifically, the study seeks to;

- Explore the relationship between household consumption expenditure and migration in rural Zimbabwe;
- Establish the factors contributing to the difference between actual and counterfactual consumption expenditure among households with migrants; and
- Investigate the extent to which households with migrants are made better off or worse by migration of a member

1.4 Research questions

The study seeks to answer the following questions:

- Is there a relationship between household consumption expenditure and migration in rural Zimbabwe?
- What are the factors contributing to the difference between actual and counterfactual consumption expenditure among households with migrants?
- To what extent does migration of a member make households better off or worse?

1.5 Contribution of the Study

Many studies carried out for Zimbabwe mainly focuses on the relationship between remittances and household wellbeing (Bracking and Sachikonye, 2010; Nyikahadzoi *et al*., 2019; Tevera et al., 2010; Dzingirai *et al*., 2015). A study by Nyikahadzoi *et al*., (2019) carried out on incomes, remittances and implications for the welfare of migrant-sending households in Zimbabwe investigated how migration enhances the welfare of migrant sending households using a descriptive approach. The current study reinforces this by expanding on the subject using advanced econometric techniques such as the counterfactual approach and the two stage Heckman selection model. In addition, the current study estimates the welfare impact and also the distribution of welfare among households as this part was not covered in an investigation by Nyikahadzoi *et al.,* (2019).

Migrant families carry the burden of sending the member(s) abroad in anticipation that the member(s) will remit some income back home to help those left behind. So, there is also need for a tracer study in order to uncover whether the collective family decision to send a member abroad actually improves the welfare of those left behind. Therefore, this research acts as a tracer study to fill this gap in the Zimbabwean context.

1.6 Limitations of the Study

The researcher adopted a methodology which requires identification of variables associated with the likelihood of having a migrant in the household instead of consumption expenditure change as an outcome of interest because of the nature of the data available which is cross-sectional. This is practically difficult especially when the results are very sensitive to set of variables used. Furthermore, some parts in the analysis were constrained by some important information missing in the data set, such as the year a member migrated and the time the household started receiving remittances.

1.7 Organization of the Study

An outline of this study is in the following order. Chapter Two reviews theories and empirical literature connecting migration and welfare of households while Chapter Three provides the methodology used in the research. Presentation, interpretation and discussion of empirical results are in Chapter Four. The summary, policy recommendations and conclusion are presented in Chapter Five.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

There is a lot of research carried out on the impact of migration on the welfare of households in host and sending countries. The literature mainly focuses on reasons why people migrate and the factors perpetuating streams of migration. This section reviews different theories of migration mainly focusing on the linkages between migrants and migrant sending household welfare changes.

2.1 Defining key terms

International migration refers to cross-border movement of high-skilled, semi-skilled and unskilled migrants for employment in another country (Jennissen, 2004). Gibson and McKenzie (2011) narrowed down international migration to emigration of a nation's most highly skilled individuals with university training. International migration is divided into migration to countries in Africa and to countries outside Africa. The current study defines international migration as the movement of skilled or unskilled individuals across national boundaries in search of greener pastures.

Zimbabwe National Statistics Agency (ZIMSTAT)[2] defined internal migration as complex process which involves lifetime movement of people from their birth place to a different area; change in place of abode in intervening time between censuses; and a temporary process of circular migration within the same or different provinces. For the current study, internal migrants are individuals who migrate from one ward to another ward within the same or different province in the same country.

2.2 Theories of migration and Welfare Impacts

2.2.1 The Neoclassical Approach

Todaro (1969) explained migration in the form of rural to urban context. The decision to migrate is based on potential migrant's perception of stream of income expected taking into account

[2] In 2012 ZIMSTAT national census report

prevailing urban wages and the probability of getting a job in modern industrial sector (Todaro, 1969). According to Todaro (1969), it is rational and probable to observe patterns of migration rates which exceed the growth of job opportunities in urban areas as long as there exists expectations of large positive urban – rural income differentials. Migration to cities continue even when potential migrants become aware of high unemployment rate in the urban area. Migration process continuously take place as long as people view it as a way of broadening urban contacts which increases likelihood of access to higher wage employment (Todaro, 1976).

One of the main limitations of the Todaro model is the treatment of potential migrants as homogenous in terms of skill endowments. In addition, the model also rests on the notion that migrants have a desire to live permanently in town ignoring cases of circular movement. It is important to consider that migrants may be temporary residence in the city because a migrant may fail to secure employment in the city and decide to go back to the rural area.

2.2.2 New Economics of Labor Migration

This theory pioneered by Stark and Bloom (1985), posits that decisions about migration are often made jointly by non-migrants and migrants. The central idea behind New Economics of Labour Migration theory is that decisions about migration are jointly made by households in order to minimize risk, stabilize income and cash inflows of the family. International migration is used as a way of increasing inflows of income for the household through remittances. Sending remittances back home is expected from those who had a successful experience abroad and met their aims of getting higher earnings allowing savings accumulation.

In light of remittances, altruism and pure self-interest play a critical role when it comes to migrant's decision to remit part of the income. Migrants who send money home are altruistic when the utility they derive from welfare improvement of the remaining household is positive (Horowitz, 2002). Tested empirically, altruistic behavior depends positively on migrant's income (Vanwey, 2004), thus if the migrant's income abroad is low then those left behind are likely to receive little or no remittances. This may result in total funds remitted being very small to make significant contribution to the family. In this regard, using migration as strategy to escape from poverty may not yield expected results.

Funkhouser (1995) argues that altruistic remittances depends on the relationship between the migrant and remaining household members because closer relationships stresses the importance of the household members in the migrant's utility function. For instance, if a migrant has left his wife and children behind, according to altruism, remittances are expected to be sent more frequently. Migrants also remit more in their own interest motivated by desire to accumulate assets in the future and increase family welfare (Lucas and Stark, 1985). This is normally the case when a migrant has an intention to return home after a specified period of time. Borjas and Bratsberg (1996) argued that skilled workers have a tendency of returning to their sending countries after a specified period of time. In this view, migrants go to economically stable countries for a specified period of time to accumulate certain level of wealth then return home once they achieve their objective.

The New Economics of Labour Migration theory is based on the notion that migrants get better opportunities in place they go to, which is not always the case. Furthermore, the theory ignores frictions and risks existing in the remittances market. Sending remittances using formal transfer agencies may be expensive for poor migrants, so they end up resorting to informal ways such as use of relatives and bus conductors. However, these informal ways are very risky to such an extent that in some cases the funds and goods sent end up being expropriated.

2.3 Empirical Literature Review

The empirical literature covers impacts of migration on welfare of households and also looks into specific channels like remittances. The impact of migration on welfare of the family members left behind is a complex phenomenon because it depends on who leaves, who stays behind and duration of migration. The empirical literature shed some light on this ambiguous a priori.

Barham and Boucher (1998) examined migration net effects on distribution of income using cross sectional data from 152 Bluefields, Nicaraguan households. To deal with endogeneity, the study estimated migrants counterfactual incomes if the individuals had not migrated. The two stage Heckman selection model was used to control for selection bias. The regression process did not find presence of selection bias in migration process suggesting that the process of migration was random. The findings revealed that inequality in income distribution is higher when household income incorporate international remittances.

To examine if international migration brings income gains to migrants, McKenzie *et al*. (2008) a survey based on 438 Tonga households was done. The research question was complicated by potential selection bias because migrants were not randomly selected from the population. To solve selection problem, authors performed a lottery system in which a quota of migrants in New Zealand were allowed in the using a random ballot on choice of applicants. The results indicated that international migration increased income of the migrants by 263% in the first year of migration.

Beegle *et al.* (2011) investigated the impact of internal and international migration on wealth and poverty in Tanzania making use of panel data over the period of 1991 to 2004. A difference in differences estimation technique was used to deal with unobserved heterogeneity controlling for primary fixed effects of households. Potential endogeneity problem was solved by extending the analysis to two stage least squares using economic shocks, household head and age as instrumental variables. The results indicated that, on average, migrants 36 percentage points higher consumption than individuals who stayed at home. Despite the fact that panel data used in this model were informative, the instrumental variables used were weak and the parallel trend assumption required for difference in differences methodology was also weakly met.

Using Migrating Out of Poverty 2015 Survey data for Zimbabwe, Dzingirai *et al*. (2015) explored the contribution of migration and remittances on poverty reduction using a descriptive approach. The results indicated that male migrants earned more income and also remit more money as compared to female migrants. The difference in earnings was attributed to horizontal segregation in the job market which sees females working as domestic workers while men are in skilled construction. In some instances, the welfare of households was made worse off because of xenophobia attacks in South Africa which resulted in some of the migrants losing their lives while others losing their employment. The main limitation of this study is that it ignored non-cash remittances which plays a critical role when it comes to changing consumption patterns of the members left behind. The study would also have been much more informative if welfare assessments were conducted before the family had a migrant and after the member has left.

Abdelmoneim and Litchfield (2016) evaluated migration impact on welfare of migrant sending households in Ethiopia using cross sectional data collected in 2014. The study used a two stage Heckman model to deal with the selection problem. The results indicated that migration positively affects living standards of households in rural Ethiopia. However, the changes in welfare were not

evenly distributed across households. In fact, poor households experienced a decline in living standards as a result of having a migrant while rich households experienced substantial increase in welfare as a result of sending a migrant abroad.

2.3.1 Limitations and Gaps

Migration welfare nexus literature generate the stylized fact that migration improves living standards of the families left behind but the major challenge is on assessing the extent of benefits. A holistic assessment of such benefits should occur in at least two states which are before the migrant has moved and after the migrant has left. This kind of analysis requires panel data which is scarce mostly in developing countries, thus making more informative assessments infeasible.

In many studies (Barham and Boucher, 1998; McKenzie *et al*., 2008; Dzingirai *et al*., 2015), researchers have cross sectional data which impose some constraints on methodological choices. According to Ravallion (2008) when a researcher has cross sectional data, a counterfactual analysis is appropriate especially when one wants to address potential outcomes under scenarios of non-participation. Although many studies use this analysis, there is still a persistent debate on whether migration costs and benefits accrue to the treatment group or entire household. For instance, Posel (2001) posits that remittances are sent to specifically known individuals not the entire household suggesting that analysis of the welfare impacts should target recipients. However, Azam and Gubert (2003) did a cross country study for African countries which demonstrated that remittances are sent to the entire household rather than specific individuals.

The current study follows the view demonstrated by Azam and Gubert (2003) which seems appropriate since welfare changes are normally assessed at household level. In addition, this collective approach is also embedded in Stark and Bloom (1985) New Economics of Labour Migration theory where decisions about migration are a family unit outcome of jointly maximizing utility of a household.

2.4 Conceptual framework

To establish whether migration increases the welfare of households with a migrant, the study compares consumption expenditure for households with no migrants and with migrants. However, comparison using consumption levels observed is crude and less informative because it does not show how the act of having a migrant changed the standard of living of the household. A more

interesting conceptual issue is uncovering what consumption expenditure of the household might have been if the migrant member of the household had stayed at home. The conceptual problem is hypothetical and unobservable because it presents a scenario of something which has not occurred. Dealing with this issue requires a methodology which allows for construction of a counterfactual scenario as hinted in literature review is required.

The counterfactual approach is constructed from an angle of selection in which there are unobservable and observable characteristics which makes households with migrants more likely to send members abroad. For instance, higher savings allowing households to finance migration, and high levels of education which increases the desire to move in search of well-paying jobs. These characteristics may affect the probability of having a migrant in a household but they may also be correlated with consumption expenditure leading to selection bias.

The study addresses the selection problem by applying the two-stage Heckman selection model. The first stage estimates the likelihood of having a migrant in the household and then use the estimates to generate an Inverse Mills Ratio (IMR). The IMR will be used as an additional covariate in second stage regression model. Selection-corrected regression results are then compared with those from a model not adjusted for selection bias.

However, it is worth noting that the extent to which unobservable characteristics biases OLS estimates of the per capita consumption expenditure for non-migrant households, as well as the predictions of per capita consumption expenditure for migrant sending households remains an empirical issue which can also be a confounding factor for the gap between actual and counterfactual consumption.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter seeks to develop a model for investigating whether migration changes the welfare of migrant-sending families. An insight into the estimation procedure and dataset are presented in this chapter.

3.1 Model Specification Framework

The estimation framework is guided by the specification by Adams (2006); Abdelmoneim and Litchfield (2016) who estimated migration impact on welfare of migrant sending households in Ghana and Ethiopia respectively. Consumption is first modelled for households without migrants then parameter estimates predicted are used to generate counterfactual consumption i.e. consumption expenditure levels if migrant members had stayed at home. Adopting a specification by Abdelmoneim and Litchfield (2016), the model can be specified as follows:

$$\ln(PHE_{ij}) = \alpha_0 + \sum_{i=1} \beta_i X_i + \sum_{i=1} \vartheta_i HH_i + \sum_{i=1} \gamma_i HC_i + \sum_{i=1} \delta_{ij} R_{ij} + \sum_{i=1} \theta_i HD_i + \varepsilon_i \ldots (1)$$

Where $\ln(PHE_{ij})$ represents natural logarithm of consumption expenditure per capita on non-food and food items for household i in district$j$; X_i represents ownership of land and demographic characteristics; HH_i denotes household head demographic characteristics; HC_i are household human capital characteristics; R_{ij} are district dummies; HD_i are characteristics of dwellings and ε_i is the error term.

Adams (2006) justified the use of household consumption expenditure per capita as a dependent variable instead of income of the household based on the following reasons. First, expenditures are measured more accurately compared to income in surveys because some economically active individuals are employed themselves in agriculture which makes income measures noisier. Second, because of fluctuations in income, households save and smooth consumption making expenditure a better reflection people's welfare changes over time. Third, respondents in most cases are not willing to disclose information about their incomes.

Reported incomes are associated with measurement error which emerges from respondents' inability to recall or report income inaccurately and there are no remedies to correct this in the existing survey tools (Deaton, 2010; Beegle *et al*., 2016). This is particularly the case in developing countries where the majority of households earn most of their income in the informal sector. More importantly, the measurement error in payment is not random; measurement error has been empirically linked to household characteristics. Because of these reasons, consumption is generally viewed as a better approximation of "money metric utility" than income for developing countries.

However, per capita consumption expenditure has its own limitations. First, assuming that every member of the household has an equal share of consumed items irrespective is unrealistic (Ravallion, 2008). Second, use of per capita consumption expenditure ignores potential economies of scale.

The coefficient estimates from equation (1) are used to generate hypothetical consumption expenditure for households with migrants. The predicted values are used as estimates of what consumption expenditure of households with migrants could have been if the migrant members had remained at home. Thereafter, a comparison of counterfactual consumption expenditure and actual consumption expenditure for households with migrants is done. A Probit regression model is then estimated with a dummy variable $Welfare\_Status_{ij}$, which is one if actual consumption expenditure is larger than counterfactual expenditure (meaning migration makes households better off) and zero otherwise. The differences are then regressed on all the covariates in order to inspect the sources of the differences:

$$Welfare\_Status_{ij} = \alpha_0 + \sum_{i=1} \beta_i X_i + \sum_{i=1} \vartheta_i HH_i + \sum_{i=1} \gamma_i HC_i + \sum_{i=1} \delta_{ij} R_{ij} + \sum_{i=1} \theta_i HD_i + \varepsilon_i \ldots\ldots\ldots (2)$$

Ordinary least squares estimation of equation (1) is based on a strong assumption that households with no migrants and households with migrants are comparable groups and migration across households occur randomly. This assumption may not hold since individual migration decisions can be driven by characteristics which are not distributed randomly across households. For instance, households with migrants might have characteristics which are observable and unobservable such as personal contacts or networks in other countries, high savings allowing them to cover costs of migration and high education levels which enhances the likelihood of migration

of members within these households. If some of the characteristics which affect the probability of migration are correlated with expenditure on consumption then parameters of explanatory variables of the consumption equation will be biased and inconsistent (Adams, 1989). In addition, this will also affect the counterfactual consumption expenditure of migrant households predicted using parameter estimates of households without migrants. Thus, there is need for a method to correcting the bias and this method is a Heckman two-stage selection model (Heckman, 1979).

3.1.1 The Heckman Model

This is a method which is applied to resolve selection bias. The model is applied in two stages. A choice equation is estimated first in order to capture what explains the decision to migrate decision. The second stage estimates a consumption equation for a sample of households with no migrant.

The first stage estimates the probability that a household does not have a current migrant using a Probit model choice function similar to what Barham and Boucher (1998) usedin their study. The second stage equation estimates a consumption equation of households without migrants. Model identification requires that there should be at least one covariate first stage equation which is not included in second stage equation, that is, the covariate should correlated with the probability of being a household without a migrant but uncorrelated consumption spending. Age of the household head and being a Christian may serve this purpose.

The variable age is used based on the notion that families with an older household head are expected to comprise of more adult members mature enough to seek other avenues of better life, thus increasing chances of selecting into migration (Adams, 2006). According to Adams (2006) once dependency ratio is controlled for, then age of household head does not have a direct effect on consumption.

The variable Christian is included in the model because this religion is predominant in Southern Africa which is the main destination of Zimbabwean migrants. Christians use belonging to the same denomination as networks; thus, Christians are more connected and they are more likely to send a migrant abroad (Beyene, 2014). In 2018 Migrating Out of Poverty survey data for Zimbabwe, about 94% of the households reported being Christian while only 6% reported belonging to other religious groups. In the households who reported being Christian, 75% of them

had a migrant while of the households who reported belonging to other religious groups, 67% of them had a migrant member.

A Probit model is used to estimate the probability that a household does not have a current migrant. The dependent variable is dummy, equals one for households without current migrants and zero otherwise. The model is then specified as:

$$M_H^* = \alpha_0 + \sum_{i=1} \beta_i X_i + \sum_{i=1} \vartheta_i HH_i + \sum_{i=1} \gamma_i HC_i + \sum_{i=1} \delta_{ij} R_{ij} + \sum_{i=1} \theta_i HD_i + \sum_{i=1} \tau_i Z_i + \varepsilon_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.. (3)$$

$$M_H = \begin{cases} 1, if \;\; M_H^* > 0 \\ 0, if \;\; M_H^* \leq 0 \end{cases}$$

Where M_H^* denotes the likelihood that there is no current migrant the household and Z_i captures identifying variables.

In general, families with a large household size are likely to have high costs of moving, thus leading to a lower likelihood of migrating. Marré (2009) argues that land ownership influences migration decisions, since where there are no well-defined property rights transferring access to land legally is associated with some huge costs which may impede members from making migration decisions.

Level of education is expected to affect migration because people with higher levels of education have a high chance of being employed in countries of destination (Greenwood, 1997; Todaro, 1977). District dummies are part of the covariates because proximity to the border reduce distance and costs of migrating into neighbouring countries. Hence, the probability of migration is expected to be high in households which stays closer to the borders.

The Inverse Mills Ratios (IMR) are yielded after estimating equation (3) and then included in equation (4) as an independent variable. A statistically significant coefficient of the Inverse Mills Ratio in equation (4) indicate that there is selection bias. The consumption equation with a selection term (IMR) is given by the equation:

$$\ln(PHE_{ij}) = \alpha_0 + \sum_{i=1} \beta_i X_i + \sum_{i=1} \vartheta_i HH_i + \sum_{i=1} \gamma_i HC_i + \sum_{i=1} \delta_{ij} R_{ij} + \sum_{i=1} \theta_i HD_i + \rho IMR_i + \varepsilon_{2i} \ldots\ldots\ldots\ldots.. (4)$$

The first stage choice function has more covariates than the second stage equation, so the two-stage Heckman model is identified. The identifying variables are Christian and age of the head of the household. If ρ is statistically insignificant, then ordinary least squares regression estimates are be unbiased. But, if ρ is statistically significant then OLS will give inconsistent estimates.

3.2 Data and Data Source

The analysis was done using data from Zimbabwe Household Survey-2018, collected by the Centre for Applied Social Sciences (CASS) of the University of Zimbabwe, through funding from the UK's Department for International Development (DFID) and made available by the Migrating out of Poverty Research Programme Consortium, the School of Global Studies and University of Sussex, UK. Out of the 1,146 households, 287 households do not have a current migrant member; and 859 households have one or more migrant member(s). Out of the 859 migrant households, 367 households have a migrant classified as international, 391 households have migrants classified as internal, and 101 have both internal and international. The data used in the analysis is unweighted as the sampling weights were not provided in the data.

3.2.1 Sampling Techniques

The multistage sampling strategy was used to select wards, villages and households. In each district, two wards were selected, one close to the district's main town and the other some distance away. From each of the selected wards, two villages (in practice, Village Development Committees (VIDCOs)) were randomly selected. In each of the selected villages, a list of households was obtained from the village development chairperson. Using a number of key informants in each village, each household was categorized in terms of whether it had migrants or not. For the purpose of the household list, migrants were defined as any member who was currently living outside the VIDCO for a continuous period of 3 months or more, irrespective of when the household member migrated as key informants were not expected to have precise information on the date of migration.

Purposive sampling was used to select households with and without migrants, the breakdown between internal and international migrants within the group of households with migrants was not specified.

3.3 Variable Description and a Priori Expectation Sign

The variables are summarized in Table 3.1. Explanatory variables are also conceptually grouped as shown in the Table.

Table 3. 1 Description of all variables used

Name of variable	Variable	Description of the variable	Sign expected consumption equation
Dependent variables:			
Logarithm of consumption Expenditure per capita	lnPHE	Log of annual consumption expenditure per capita on food and non-food items	
Migration Status	M_H	1 if a household has no current migrant and 0 otherwise	
Explanatory variables			
Household characteristics			
Household size	Hsze	Total members in a household	Negative
Number of Children	Child	Total members aged 14 or less	Negative
Self-employment	Self_emp	Main activity for members in household, 1 self-employment, 0 otherwise	Negative
Remittances	Remit	1 for households who receives remittances and 0 otherwise	Positive
Homestead land ownership in village	Ownvil	1 if has ownership of homestead land, 0 otherwise	Negative
agricultural land ownership	Ownagrl	1 if have access to agricultural land,0 otherwise	Positive
Characteristics of household head			

Christian household head	Christian1	Household religion: 1 if Christian, 0 otherwise	Positive
Age of Household head	Hhdage	Age of the head of household	Positive
Human capital characteristics:			
Highest education level	Maxeduchigh	Highest education years in household	Positive
Regional Characteristics			
Chivi	Chivi	1 if household lives in Chivi, 0 otherwise	Positive
Gwanda	Gwanda	1 if household lives in Gwanda, 0 otherwise	Positive
Hurungwe	Hurungwe	1 if household lives in Hurungwe, 0 otherwise	Negative
Dwelling characteristics:			
House ownership	Houseown	1 for households owning a house they live in, 0 otherwise	Positive
Number of rooms	No. of rooms	Number of rooms	Positive
Electricity access	Electricity	1 for access to electricity, 0 otherwise	Positive
Firewood main fuel	Firewood	1 if firewood is main cooking fuel type, 0 otherwise	Positive
Wall made of wood material and mud	Wallwood	1 if main material of the wall is wood and mud, 0 otherwise	Negative

Source: Author's Compilations from 2018 MOOP Household Survey for Zimbabwe.

- *Characteristics of the regions*

Most of the households in Hurungwe have internal migrants while majority of households in Chivi and Gwanda have international migrants (Nyikahadzoi *et al.,* 2019). Hurungwe is

located in Mashonaland West while Chivi and Gwanda are located close to the boarder of South Africa. According to Tawodzera and Crush (2016) living in districts which are closer to South Africa makes it cheap and easier to send remittances to Zimbabwe. Since remittances may be used to bridge the gap between consumption and income they are expected to contribute positively to consumption expenditure. The relationship between residing in Hurungwe and consumption expenditure is expected to be negative. This is due to the fact that the district is far from neighbouring countries borders and major cities. Households who live in remote areas like Hurungwe infrequently receive remittances and financial support from those in the city because there are limited ways of sending funds to less connected areas. The option for migrants will be to go with the handouts in person to those left behind. Since it is an expensive option, migrants end up going infrequently leading to households having less to spend on consumption.

- *Household dwelling characteristics*

Households who own a house and have access to electricity are expected to spend more on food and non-food items. This is because these households are generally classified as wealthy. In addition, households with access to electricity pay electricity bills, buy replacement bulbs and other electrical gadgets. Hence, these dwelling characteristics are expected to increase consumption spending. A priori expectation sign for Wallwood is negative. Households living in houses made of wood and mud are generally classified as poor when compared to households living in houses made of concrete. Hence they are expected to spend less on consumption.

CHAPTER FOUR

ESTIMATION, PRESENTATION AND INTERPRETATION OF RESULTS

4.0 Introduction

This chapter presents results from the estimations done guided by the methodology. Interpretation and discussion of the results are also part of this chapter.

4.1 Descriptive Statistics

The households are subdivided into households with no migrants and households with migrants. Table 4.1 shows the annual consumption expenditure in United States Dollars (USD) for these two categories of households.

Table 4. 1 Consumption expenditure for households with migrants and with no migrants, 2018

	Households with Migrants	**Households with no Migrants**
Average Annual Total Consumption Expenditure (in USD)	763.08	605.47
Average Annual Total Consumption Expenditure per Capita (in USD)	139.68	108.33
No. of Observations	859	287

Source: Calculations of the author using MOOP 2018 survey data

Table 4.1 shows that average total consumption expenditures and average per capita consumption expenditures for households with migrants are higher as compared to households with no migrants. Since expenditures on food and non-food items are used as proxy for welfare, this implies that on average households with migrants are better off than households with no migrants. But this crude way of comparison does not demonstrate that migration is good because there is no information about household living conditions prior migration of a member.

Table 4. 2 Descriptive statistics for explanatory variables

	Households with Migrants		Households with no Migrants	
	Mean	**Std. Dev**	**Mean**	**Std. Dev**
Number of children in a household	2.36	1.28	2.39	1.27
Age of household head	39.97	20.72	38.74	20.79
Number of rooms	3.00	1.26	2.42	1.17
Household size	4.9	2.3	5.44	2.25
Maximum years of education	10.56	2.3	10.31	2.11
Electricity access	0.04	0.21	0.03	0.18
Wallwood	0.01	0.10	0.02	0.13
Ownership of agricultural land	0.94	0.22	0.97	0.18
Self-employment	0.32	0.47	0.38	0.49
Chivi	0.33	0.47	0.34	0.48
Hurungwe	0.34	0.47	0.38	0.49
Gwanda	0.33	0.47	0.27	0.45
Own homestead land in village	0.88	0.32	0.90	0.30
House ownership	0.96	0.20	0.94	0.23
Firewood main cooking fuel	0.99	0.08	0.99	0.08
Number of observations	859		287	

Source: Calculations of the author using MOOP 2018 survey data

Table 4.2 shows that the average age of a household head within the category of household with migrants is 40 and is 39 for the no migrants' category. This suggest that on average the household heads are economically active which may increase the probability of selecting into migration. The average household size is five for both households with current migrants and households without current migrants. A small household size is likely to have lower costs of moving, thus higher likelihood of migrating, *ceteris paribus.* The number of rooms for both categories are three on average. Number of rooms may influence the decision to migrate, since the desire to have more rooms which can accommodate members of the family and improve dwelling conditions may stimulate members' decision to migrate. From the statistics displayed, members of households with migrants have slightly more years of education as compared to households with no migrants,

which suggest a positive migration selection process. Access to electricity proportions of 0.04 for households with migrants and 0.03 for households without migrants' shows that households in these two categories living in the selected rural areas under study have low access to electricity. Their main source of energy is firewood as indicated in Table 4.2 that 99% of households in both categories use firewood as their main source of fuel. A high proportion of households in the sample own agricultural land as indicated by 94% for households without migrants and 97% for those with migrants. A high proportion of the households in both categories also own a homestead land in the village as well as the houses they live in. This may be an indication that their life is rural based. There is a very small proportion of households living under dwellings whose main material is wallwood. This may suggest that the sampled households staying in Gwanda, Chivi and Hurungwe are living in improved dwellings. The sample is almost equally distributed among the three districts under study. About 38% of the households with no migrants reported self- employment as their main activity and this is 0.06 percentage points higher than what households with migrants reported. Overall, the results from Table 4.2 shows that characteristics of households with migrants and households without are almost similar.

4.2 Empirical Results

The OLS estimates before controlling for selection bias are presented first. These estimates enhance the understanding of factors which causes variation in consumption expenditures among households with no migrants.

Table 4. 3 OLS regression results for consumption per capita of households with no migrants

Dependent variable: Log per capita household consumption **Explanatory Variables**	**Coefficients**
Household size	-0.0127
	(0.0199)
Electricity access	0.553*
	(0.325)
Maximum years of education	-0.0523***
	(0.0192)
Number of children in a household	0.0477
	(0.0340)

Number of rooms	0.0702*
	(0.0363)
Wallwood	-0.469
	(0.333)
Ownership of agricultural land	1.076**
	(0.469)
Hurungwe	0.181*
	(0.103)
Gwanda	0.0597
	(0.110)
Self-employment	-0.183**
	(0.0840)
Own homestead land in village	-0.219
	(0.178)
House ownership	-0.353
	(0.271)
Firewood main cooking fuel	0.896
	(0.372)
Constant	3.342***
	(0.672)
Observations	287
R-squared	0.162

Note: (a) Standard errors in parentheses, (b) ***; ** and * means statistically significant at 1%, 5% and 10% respectively

The education variable coefficient is negative and statistically significant at 1% level. This indicates that an additional year of education, on average, causes per capita consumption expenditure to decrease by $0.05 per member of the household, ceteris paribus. The result is different from the priori expectation sign. This may be due to the fact that the educated individuals in families without migrants have lower levels of consumption because their spending is financed from a limited pool of household funds. Considering the fact that money which is supposed to be

channeled towards consumption expenditure is directed to travelling transaction costs for educated members the household may end up living with what is available, thus even educated members end up having less consumption per capita despite high levels of education.

The coefficient for electricity access as a dwelling characteristic is positive and statistically significant at 10% level. This shows that for a household with access to electricity, the consumption expenditure per capita on food and non-food items will be 55.3% more when compared to a household without access to electricity. The result corroborates Ward (2008) who found out that the majority of households with access to electricity in rural areas are either high or medium income earners. Furthermore, he also indicated that, on average, high and medium income earners have higher consumption spending per capita compared to low income earners.

Number of rooms are positively related to consumption per capita expenditure, thus households with more rooms spend more on food and non-food items. Number of rooms is an indicator of housing quality. The result is consistent with Solari and Mare (2012) who found out that households who earn lower income live in overcrowded dwellings and have lower consumption spending per capita while those earning medium to high income have more dwelling space and higher consumption per capita.

Ownership of agricultural land in the village variable is positive and statistically significant at 5% level. This indicates that a household which owns agricultural land in the village reported 107.6% more consumption expenditure per capita on food and non-food items when compared to a household which does not own agricultural land in the village. This may be due to the fact that household heads who own agricultural land in rural areas incentivize their family members who supply labour services in the fields through buying them new clothes and durable goods like bicycles especially towards the farming season. This is normally done in order to lure the members to continue with household agricultural production rather than considering outside options.

A household reporting that the main activity is self-employment has 18.3% less consumption expenditure per capita on food and non-food items than when main activity was formal paid employment. The result is consistent with findings by Abdelmoneim & Litchfield (2016) who found a negative relationship between consumption per capita and percentage of members of the household whose main activity was in self-employment.

The study used coefficients in Table 4.3 to estimate what consumption expenditure of households would have been had migrant members remained at home (counterfactual consumption expenditure for households with migrants). Table 4.4 shows a comparison of the counterfactual and actual per capita consumption expenditure of the households as well as the paired test for the difference.

Table 4.4 Paired t-test of the mean actual and counterfactual per capita expenditure of households with migrants.

H_o: mean (diff) = 0

Natural logarithm of per capita expenditure	**Mean**	**Std. Dev**
Actual	4.50	0.77
Counterfactual	4.45	0.34
Difference (diff)	0.05	0.84

Ha: mean (diff) < 0 Ha: mean (diff) ≠ 0 Ha: mean (diff) > 0

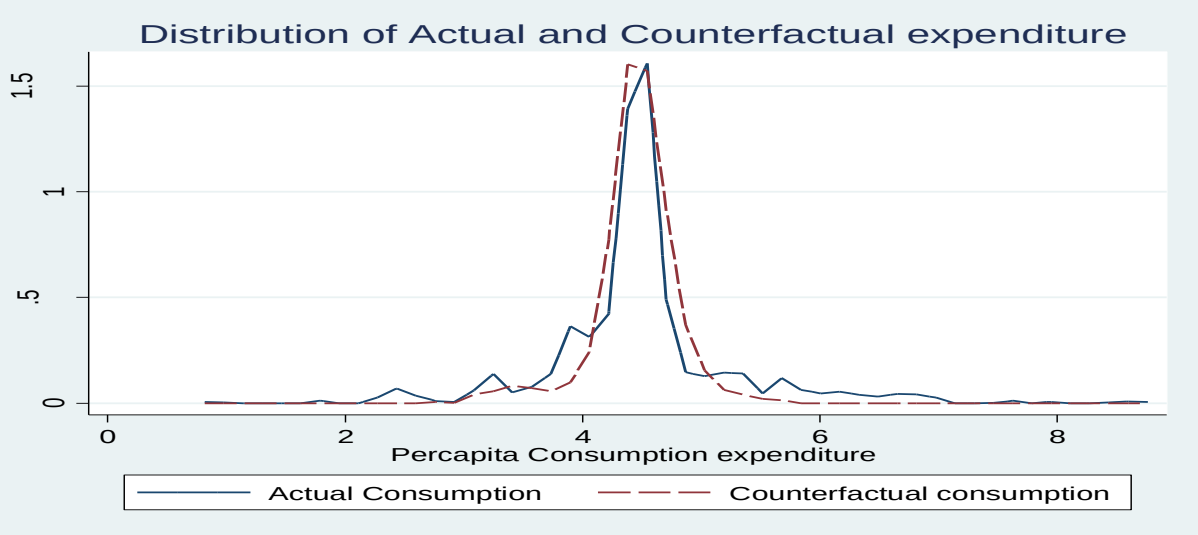
Pr(T < t) = 0.97 Pr(|T| > |t|) = 0.0628 Pr(T > t) = 0.03

The test results indicate that the means are statistically different from each other at any level greater than 6.28%. Table 4.4 also shows that, on average, households with a migrant member are better off as compared to a scenario where the migrant had stayed behind. Thus, average actual consumption expenditures observed are statistically higher than counterfactual consumption expenditure. The key finding here is that before controlling for selection, the welfare of households with migrants would have been 5 percentage points lower if the migrant members had stayed at home. The implication is that having a migrant increases the average consumption expenditure per member of the household.

Figure 3 shows a comparison of the distribution of counterfactual and reported consumption expenditure for the households with migrants. Below the mode of the consumption expenditure distribution, the counterfactual consumption distribution is slightly to the left of actual consumption expenditure distribution. This means actual expenditure on consumption is higher than counterfactual consumption expenditure indicating that migration makes households better off. However, above the mode and at higher levels of consumption expenditure, the distribution of

counterfactual consumption is slightly to the right of actual consumption distribution indicating that migration makes migrant sending households worse off. This contrasting result implies that migration of a member has different welfare effects to different households. Thus, some households are made better off while others are made worse off. In fact, before controlling for selection, of the 859 households with migrants 429 were made worse off while 430 were made better off by migration of a member[3].

Figure 3. Counterfactual and actual consumption distribution for households with migrants



Source: Author's calculations

Table 4.5 shows the marginal effects from a Probit regression model[4] which are estimated in order to establish what explains the differences between counterfactual and actual consumption expenditure. The coefficient of household size suggest that each additional member in the household raises the likelihood of being made better off by 2.3 percentage points while the probability increases by 4.8 percentage points for each additional year of education, *ceteris paribus*. However, having an additional child in the household reduces the probability of being made better off by migration of a member, on average, by 5.0 percentage points while the probability decreases by 7 percentage points for each additional room in the household, *ceteris*

[3] This is the number of households with counterfactual expenditures larger than actual (worse off) and counterfactual smaller than actual (better off).
[4] Probit model coefficients are in the appendices (Table1.1).

paribus. Households owning a house they live in are 27.8 percentage points more likely to be made better off by migration of a member compared to those who do not own the house, *ceteris paribus*.

Table 4. 4 Probit regression model marginal effects[5] of difference between actual and counterfactual consumption expenditure.

Variables	**Marginal effects**
Household size	0.023
	(2.91)**
Electricity access	-0.133
	(1.63)
Maximum years of education	0.048
	(7.52)**
Number of children in a household	-0.050
	(3.58)**
Number of rooms	-0.070
	(5.45)**
Wallwood	0.253
	(1.41)
Ownership of agricultural land	-0.665
	(6.69)**
Hurungwe	-0.161
	(4.06)**
Gwanda	0.003
	(0.08)
Self- employment	0.141
	(4.42)**
Own homestead land in village	0.249
	(4.92)**
Remittances	-0.076

[5] The marginal effects estimated are all "on average" because Stata calculates the average partial effects at the mean.

	(2.42)*
House ownership	0.278
	(3.10)**
Firewood main cooking fuel	0.000
N	853

Note: (a) Standard errors in parentheses, (b) ***; ** and * means statistically significant at 1%, 5% and 10% respectively

Households in Hurungwe are 16.1 percentage points less likely to be made better off by migration of a member as compared to a households in Chivi, *ceteris paribus.* This may be due to the fact that Chivi is closer to the border of South Africa, implying less travelling costs to South Africa when compared to individuals in Hurungwe. Similarly, households receiving remittances are 7.6 percentage points less likely to benefit from remittances. This is consistent with Vanwey (2004) who alluded that sometimes the amount of money remitted is very small to contribute significantly to the family. Households with a member whose main activity prior migration was self-employment are 14.1 percentage points more likely to be made better off by migration as compared to households who were in paid formal employment prior migration. Households who own agricultural land in the village are 66.5 percentage points less likely to be made better off by migration than those who do not own agricultural land, *ceteris paribus*.

4.3 Estimation results for two-stage Heckman model

Table 4.3 give interesting results but they have not been controlled for self-selection, so it might be less appealing to compare households with migrants and households without migrants directly. This is because positive selection bias is expected when migrants who are better educated and young have strong preference towards migration. In the presence of positive selection bias, the counterfactuals from the OLS procedure are underestimated. Thus, a two-stage Heckman Selection model is applied as discussed in chapter three. The marginal effects of the first stage Probit regression model are presented in Table 4.6[6].

Marginal effects shown in Table 4.6 imply that owning agricultural land in the village decreases the probability of selecting into migration as compared to no agricultural land ownership, *ceteris*

[6] The Probit model coefficients are presented in appendix 1.2

paribus. This result is in line with Marré (2009) who alluded that land ownership deters the decision to migrate through potential additional cost of legally transferring land access rights. In addition, a large household size decreases the likelihood of migration. However, high level of education and large number of rooms increases the probability of migration of members in the household, *ceteris paribus*. Owning a house and living in Gwanda increase the probability of migration as compared no house ownership and living in Chivi, respectively.

Table 4. 5 First stage Probit model marginal effects

Variables	**Marginal effects**
Household size	0.0243***
	(0.00625)
Electricity access	-0.0101
	(0.0690)
Maximum years of education	-0.0100*
	(0.00567)
Number of children in a household	-0.0178
	(0.0112)
Number of rooms	-0.0441***
	(0.0109)
Wallwood	0.116
	(0.106)
Ownership of agricultural land	0.111*
	(0.0656)
Hurungwe	0.00524
	(0.0337)
Gwanda	-0.0719**
	(0.0324)
Self- employment	0.0438*

	(0.0266)
Own homestead land in village	0.0424
	(0.0426)
House ownership	-0.131**
	(0.0621)
Firewood main cooking fuel	-0.0475
	(0.155)
Age of household head	-0.000411
	(0.000608)
Christian household head	-0.0138
	(0.0507)
Observations	1,146

Note: (a) Standard errors in parentheses, (b) ***; ** and * means statistically significant at 1%, 5% and 10% respectively

The Heckman selection model exclusion restrictions in the selection model are insignificant. This may be due the fact that Christianity is a common religion in Zimbabwe, which has different denominations. Thus, the extent to which migration networks differ across denominations can neutralize the effect of overall Christianity as an exclusion restriction in the model. Theoretically, the expectation is that there is a non-linear relationship between household head's age and the decision to migrate. The author adopted a general to specific approach to modelling and did not include the square of age because the model without non-linearity produced better results than those which included non-linearity in age.

Selection equation Probit model coefficients (in appendix 1.2) were used to create the Inverse Mills Ratio variable included in second stage (selection corrected) regression model. The results are presented in Table 4.7.

Table 4. 6 Second stage (selection corrected) OLS regression results of per capita consumption for households with no migrants

Variables	**Coefficients**
Household size	0.00623
	(0.0231)
Electricity access	0.551**
	(0.244)
Maximum years of education	-0.0583***
	(0.0195)
Number of children in household	0.0323
	(0.0354)
Number of rooms	0.0444
	(0.0390)
Wallwood	-0.351
	(0.312)
Ownership of agricultural land	1.135***
	(0.236)
Hurungwe	0.174*
	(0.0968)
Gwanda	0.0213
	(0.108)
Self-employment	-0.158*
	(0.0829)
Own homestead land in village	-0.169
	(0.140)
House ownership	-0.501**
	(0.210)
Firewood main cooking fuel	0.892*
	(0.515)
Inverse Mills Ratio	0.247
	(0.159)
Constant	3.230***

	(0.646)
Observations	287
R-squared	0.170

Note: (a) Standard errors in parentheses, (b) ***; ** and * means statistically significant at 1%, 5% and 10% respectively

The most crucial result in Table 4.7 is the coefficient of the Inverse Mills Ratio, which is insignificant in this case, suggesting that selection is not a critical issue here. Thus selection does not bias the coefficient estimates presented in Table 4.3. This result of no selection bias is similar to those found by Adams (2006) in Ghana, Barham and Boucher (1998) for households in Nicaragua. However, these results differ from the common view in the literature (Flahaux & De Haas, 2016; Polavieja *et al*., 2018; Van de Werfhorst and Heath, 2019; Kone *et al.,* 2020) that migrants select into migration.

However, it is unsurprising that the Inverse Mills Ratio is insignificant since the exclusion restrictions are all insignificant in the selection equation. Hence, the finding that migrant sending households are not selected is partly an artefact of the choice of exclusion restrictions. Thus, it is reasonable acknowledge that our model has failed to identify the correct selection mechanism and migration selection that may be occurring. There is a possibility that selection is more subtle than modelled in this study and there are different opposing selection processes for heterogeneous group of migrants. For instance, females and males react differently to drivers of migration.

The Inverse Mills Ratio is insignificant, so the coefficient estimates in Table 4.3 (OLS regression) and two stage Heckman model results are almost similar. Thus, the current study will not generate new counterfactuals using selection corrected model but rather rely on counterfactuals created using the estimates in Table 4.3 since the results are consistent and do not severely suffer from selection bias. Therefore, based on results reported in Table 4.4, the welfare of households with migrants would have been 5 percentage points lower if the migrant members had stayed at home. Ultimately, on average, migration of a member improves the welfare of migrant sending households in rural Zimbabwe.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The main goal of this study is to investigate whether migration improves welfare of migrant sending households in rural Zimbabwe using 2018 household survey data from Migrating Out of Poverty Research Consortium. The methodology for modelling the relationship between migration and household consumption as proxy for welfare was adapted from Adams (2006); Abdelmoneim and Litchfield (2016).

Selection bias is statistically insignificant in the study. This suggests that estimation of counterfactual consumption expenditure based on the characteristics observed from household with no current migrants did not produce severe bias. This finding underlines that selection bias was less significant in the investigation of migration impact on household welfare.

The estimates from Ordinary Least Squares regression and two stage Heckman model are almost similar. A comparison of actual and counterfactual consumption expenditure shows that on average, consumption expenditure for households with migrants would have been 5 percentage points lower if the migrant had stayed at home.

There are variations in distribution of welfare across households with migrants as illustrated in Figure 3. Below the mode of consumption expenditure distribution, the counterfactual consumption distribution is slightly to the left of actual consumption expenditure distribution indicating that migration makes households better off. This suggests that migration generate welfare improvement to poor households. However, above the mode and at higher levels of consumption expenditure, the distribution of counterfactual consumption is slightly to the right of actual consumption distribution indicating that migration makes migrant sending households worse off.

5.2 Recommendations

Policy makers have to consider removal of *de facto* and *de jure* migration limitations. The existing land tenure policy which does not give the right to mortgage land is a constraint to some of the

households who would want to raise finance for migration through mortgaging agricultural land. Thus, a higher opportunity cost for households whose welfare is improved by migration.

It is imperative for policy makers to take into account situational differences of migrant sending households left behind. This help the government when establishing adequate social safety nets and supportive institutions to assist a cohort of households being made worse off by migration of a caregiver.

High costs of remitting home may constrain households from gaining significant benefits from migration. Policy makers should encourage competition in the remittance sending market through increasing the ease of doing business by reducing the time required to obtain a license to start operating in the remittance market. The government should also consider increasing one stop shop investment centers as a possible way of reducing the frictions in obtaining operating licenses.

5.3 Areas of further research

The study mainly focused on migration and household welfare nexus but did not connect consumption expenditure results to outcomes of poverty and transitions. Thus, other studies can be extended further to this area. Other studies may consider investigating the subject focusing on one separate category of migrants since aggregating all migrant sending households in the analysis as in the current study may obscure the different effects of having internal migrants, international migrants, and migrants who have been away for long (settled in receiving regions and sending remittances) as well as those who have been away for short periods still trying to find economic opportunities.

Where the data permits, other advanced econometric techniques such as propensity score matching can be used to improve the results. Furthermore, another approach would be a straightforward analysis of the effect of migration on household welfare using pooled OLS with a migration dummy and a detailed Oaxaca-Blinder type decomposition.

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APPENDICES

Appendix 1.0: Map of Zimbabwe showing the districts sampled

Source: Nyikahadzoi *et al*., 2019

Appendix1.1: Table 1.1 Probit regression model results of difference between actual and counterfactual consumption expenditure

VARIABLES	**Coefficients Probit**
Household size	0.0721***
	(0.0251)
Electricity access	-0.409
	(0.251)

Maximum years of education	0.148***
	(0.0214)
Number of children in a household	-0.154***
	(0.0439)
Number of rooms	-0.214***
	(0.0411)
Wallwood	0.777
	(0.551)
Ownership of agricultural land	-2.045***
	(0.324)
Hurungwe	-0.490***
	(0.123)
Gwanda	0.0102
	(0.124)
Self- employment	0.434***
	(0.101)
Own homestead land in village	0.765***
	(0.162)
Remittances	-0.233**
	(0.0972)
House ownership	0.854***
	(0.279)
Firewood main cooking fuel	-
Constant	-0.349
	(0.429)
Observations	853

Note: (a) Standard errors in parentheses, (b) ***; ** and * means statistically significant at 1%, 5% and 10% respectively

Appendix1.2: Table 1.2 Probit regression model results, selection-controlled

VARIABLES	Coefficients (Probit)
Household size	0.0794***
	(0.0208)
Electricity access	-0.0330
	(0.226)
Maximum years of education	-0.0328*
	(0.0186)
Number of children in a household	-0.0582
	(0.0367)
Number of rooms	-0.144***
	(0.0363)
Wallwood	0.381
	(0.348)
Ownership of agricultural land	0.363*
	(0.215)
Hurungwe	0.0163
	(0.105)
Gwanda	-0.243**
	(0.110)
Self- employment	0.143
	(0.0874)
Own homestead land in village	0.139
	(0.140)
House ownership	-0.427**
	(0.204)
Firewood main cooking fuel	-0.155

	(0.505)
Age of household head	-0.00134
	(0.00199)
Christian household head	-0.0452
	(0.166)
Constant	-0.0274
	(0.642)
Observations	1,146

Note: (a) Standard errors in parentheses, (b) ***; ** and * means statistically significant at 1%, 5% and 10% respectively