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The Impact of Remittances on The Welfare of Recipient Households in Addis Ababa: An Endogenous Switching Regression Model

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Abstract

This study examines the impact of remittances on the welfare of recipient households using an endogenous switching regression model that controls for non-random selection bias. The estimation technique for this analysis is the move-stay command that implements the Full-Information Maximum Likelihood Method to simultaneously fit binary and continuous parts of the model in order to yield consistent standard errors. It uses primary cross-sectional data collected from 250 selected households in Addis Ababa. Household welfare can be measured with different outcome indicators, namely household income, consumption expenditure, and food expenditure, for both recipients and non-recipients of remittance. The findings revealed that remittances significantly improve household income, consumption, and food expenditures for recipients in comparison with non-recipients. The results also indicate that migrant remittances would have positive welfare effects for non-recipients, had they received any transfer. Overall, the findings show that remittances have positive and significant welfare effects, lending credence to growing arguments that the government, as well as other concerned stakeholders, should effectively collaborate with the Diaspora to ease the remittance sending process and cost, in order to better extract the welfare benefit of migrant remittances.

Keywords: Remittance, Welfare, Endogenous Switching Regression Model, Addis Ababa

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Introduction

Migration is somehow inevitable in the historical processes of social, political, and economic dynamics. Specifically, development and migration are intertwined in a set of complexes, heterogeneous, and changing relationships in which causality is never one way (Bacwell, 2008). In sub-Saharan Africa, in particular, though political instabilities and social disorder have been largely considered a cause of migration, empirical evidence shows that many migrants leave their country of origin to win better bread for themselves and, more importantly, for their families under financial insecurity (Adepoju, 2008).

Migration and remittances have drawn the attention of numerous authors dating back several decades. The initial literature about the effect of migration and remittances on development, however, had a somewhat pessimistic view, as it was concerned with the reduction of the labor supply in countries with migratory outflows, predominant non-productive use of the remittances, the development of remittance dependency, and the "brain drain" from developing countries. Nevertheless, more recent literature has a more optimistic view, as it has been argued that there is the possibility of a "brain gain", and remittances are now considered to have positive short- and long-term effects, as they might contribute to poverty reduction and facilitate household investments in human and physical capital (Haas, 2007).

The World Bank report stated that the size of remittances has been increasing over time and reached USD 715 billion in 2019, up from USD 689 billion in 2018. In 2018, India received USD 80 billion in remittances, followed by China (USD 67 billion), the Philippines and Mexico (USD 34 billion), and Egypt (USD 26 billion). Excluding China, the inflow of remittances to low- and middle-income countries (USD 462 billion) was considerably higher than FDI flows in 2018 (USD 344 billion). In 2018, remittances to Sub-Saharan Africa increased by nearly 10% to USD 46 billion. This is driven by good economic conditions in developed countries. Comoros takes the lead in terms of share of GDP, followed by the Gambia, Lesotho, Cabo Verde, Liberia, Zimbabwe, Senegal, Togo, Ghana, and Nigeria (WB, 2019).

A Glimpse on the Ethiopian Economy

The inflow of remittance to Ethiopia has also been increasing, but not as expected as there are a large number of migrants and Diaspora living abroad in 85 different countries. According to the Global Economy Report (2018)[3], the average value for Ethiopia during that period was 375.16 million USD over the period 1996 to 2018. It was around USD 1796 million in 2014 and then decline to USD 436 million in 2018 due to the existence of political instability.

Remittances from migrant workers to Ethiopia are a significant foreign source of income. The World Bank ranks Ethiopia as the 8th largest remittance receiver in Sub-Saharan Africa in 2010, with an inflow of remittances reaching 387 million USD, to be compared with net foreign direct investment inflows of 100 million USD and net overseas development assistance (ODI) at 3.3 billion USD. The numbers used by the World Bank rely on the International Monetary Fund's (IMF) Balance of Payments statistics. There is however a large discrepancy between the numbers recorded by the IMF and the officially recorded remittance inflows reported by the National Bank of Ethiopia. In particular, the National Bank reports remittance inflows of about $600 million, while the actual volume of remittances, when considering flows through both formal and informal channels, is estimated to be in the range of $1 billion to $2 billion annually (World Bank, 2011).

Remittances make up a major portion of Ethiopia's economy and can hasten its economic growth. According to IMF figures, government transfers and remittances account for more than 4% of Ethiopia's GDP. According to NBE data, imports increased by 87 percent between 2004/2005 and 2007/2008. Less than 20 percent of the required money for these purchases was provided by export revenues, while half came from "private transfers," including remittances. Thus, these remittances are crucial to Ethiopia's growth even if they have a significant personal value for the recipients (Keating, 2014).

Remittance money that is paid back to the migrants' home country is one of the benefits of their out-migration. Ethiopian immigrants send money home, just like many migrants from developing nations do. Remittances are a significant and reliable source of external financing at the macro level, and they account for a sizable portion of financial inflows to Ethiopia and other nations with

[3]https://www.theglobaleconomy.com/Ethiopia/Remittances/

sizable migrant labor populations in particular. Remittance inflows are a crucial source of income for families to cover their essential needs at the household level. Although though Sub-Saharan nations do not count Ethiopia among their largest recipients of remittances, the amount of remittances flowing into Ethiopia has significantly expanded over the past several decades.

Governments, communities, and families face difficult issues as a result of the migration and remittance consequences on the country where the migrants are coming from on both the macroeconomic and microeconomic levels. Given the significant empirical and theoretical progress made over the past few decades, it is important to avoid making any generalizations about the relationship between migration, remittances, and development because these relationships are fundamentally heterogeneous and depend on both the spatial and temporal scales of analysis (Haas, 2007).

Ethiopia's economic policies should focus on maximizing the contributions of migrant remittances to increase social welfare, foster functioning markets, enhance social security, and enhance public services like health and education. Ethiopia is one of the world economies most dependent on remittances, and its foreign generation capacity is greater than its export earnings. Yet, the coexistence of government and private operators as well as a sizeable informal sector distinguish the Ethiopian remittance service business (Alemayehu et al., 2011).

Despite the massive influx of remittances, Ethiopia's economy is still characterized by rising unemployment, poverty, and declining household welfare. According to the HICES (2010/11), the proportion of poor people (poverty head count index) in Ethiopia was estimated to be 29.6% in 2010/11. While the proportion of the population below the poverty line stood at 30.4% in rural areas, it is estimated to be 25.7% in urban areas. The poverty gap index is estimated to be 7.8%, while it is 8.0% for rural areas and 6.9% for urban areas. Similarly, the national poverty severity index was 0.031, with rural poverty severity index (0.032) slightly higher than urban poverty severity index (0.027). Between 2004/05 and 2010/11, income inequality measured by the Gini Coefficient has shown a slight decline, from 0.3 in 2004/05 to 0.298 in 2010/11. Given these trends, it is not surprising that over the last decade, the overall welfare of households in Ethiopia has been reportedly low (MoFED, 2012).

Few studies have examined the relationship between remittances and economic consequences in Ethiopia. Dejene Aredo of Addis Ababa University did one of the few systematic and enlightening studies on the subject in 2005. He examined the effect of remittances (both domestic and foreign) on urban households that were more vulnerable than rural households were to different sorts of urban shocks and found that a considerable proportion of sampled households (16.63 percent) received remittances from abroad. In addition, international remittances (77 percent) exceeded domestic ones (23 percent) both in terms of volume and per capita flows. Urban households received remittances at a higher frequency during the month, suggesting that remittances were used 'largely to cover day-to-day consumption expenditures.' Only 1.1 percent of remittances in the sample were used for investment purposes, 1.7 percent for savings, and 2.8 percent for asset purchases. Aredo also found that women got more remittances than men did from both international and domestic sources, suggesting that 'remittances are a means by which poverty among the most vulnerable groups of society, i.e., female-headed households, is partially addressed (Aredo, 2005).

Alemayehu Geda and Jacqueline Irving discovered that despite remittances' contribution to Ethiopia's external funding position, there are numerous obstacles to their efficient delivery. The lack of a modern national clearing and settlement system and the low level of financial intermediation are viewed as obstacles. The majority of banks in Ethiopia are centered in the largest cities, and the networks of bank branches and ATMs are very small, with little coverage of rural areas. Ethiopia also seems to lag behind other East African nations like Kenya and Uganda in terms of the creation and application of mobile money transfers as well as the provision of financial services connected to remittances. This is in part due to Ethiopia's inadequate telecommunications infrastructure and relatively underdeveloped financial system. The majority of remittances tend to be spent or invested in real estate, which in a climate of rising inflation delivers greater returns than savings deposits and other financial assets (Geda Alemayehu and J. Irving, 2011).

The effects of international remittances on household welfare in rural Ethiopia by applying propensity score matching techniques The results show a strong positive effect of remittances on household subjective well-being (Anderson, 2012). Using the autoregressive distributed lag approach (ARDL), Mikias (2014) studied the role of international remittances on economic growth

in Ethiopia. The outcome of the study revealed that the long-run growth impact of international remittances during the study period was positive and significant. However, the short-run effect is found to be negative and statistically significant, indicating that remittance income plays a consumption smoothing role in the short run (Mikias, 2014). Solomon (2012) reaches a similar conclusion. He applied a two-part model estimated within Engle's Curve framework from Ethiopia Rural Household Survey (ERHS) data. The implication is that migration and remittances are used as short-term coping strategies and hardly used as a stepping stone to productive investment options in Ethiopia (Solomon, 2012).

All the existing literature has so far reached almost similar conclusions: remittances play a great role in the economic and social well-being of the Ethiopian economy. Nevertheless, they applied either descriptive statistics or relied heavily on secondary data. They also fail to consider a control group when comparing groups of households in different states or statuses. Thus, this study attempts to bridge the methodological gap in the literature by focusing on three primary questions: (1) Is there a statistically significant difference in the welfare indicators of households that receive migrant remittances versus those that do not? (2) What is the level and direction of remittances in relation to the welfare of recipient households? (3) What would happen if the two groups of households switched places (i.e., recipients became non-recipients and vice versa)?

Literature Review

Theories of Remittance and Its Impacts

Regarding the overall effect of remittances on emerging countries, there are two primary schools of thinking: the remittance-optimistic and the remittance-pessimistic migrant syndrome schools of thought (Ahortor and Adenutsi, 2010). International remittances, according to the remittance-optimistic developmental school's ideology, have the potential to accelerate the development process by directly funding crucial developmental projects, boosting average household incomes, easing balance of payments issues, easing debt servicing, and reducing trade imbalances between developed and developing nations.

Remittance-pessimistic schools' main justification for their position is that the pursuit of international remittances encourages migration, which deprives native developing countries of highly skilled labor and capital by displacing domestic production of tradeable goods in the brain-

drained underdeveloped economy. Therefore, through an excess demand for consumer goods relative to a deficit in domestic production capacity in developing countries, international remittance deepens the mentality of being foreign-dependent, may encourage greater inequality among households, and produces macroeconomic instability in the form of inflation.

There are two lines of reasoning that address the effects of remittances on welfare and poverty reduction at the micro level. The effect is determined by how remittances are used or spent. Remittances are presumptively consumed in the first sentence of the argument. According to this reasoning, there is no effect of income source on expenditure since households combine their various sources of income. Remittances are hence frequently regarded as a single source of revenue and as such are not subject to several decision-making procedures. To put it another way, remittances don't directly affect spending; rather, the only connection between the two is the income effect. The second school of thinking presents an entirely different line of reasoning. Because households do not combine their many sources of income, it is believed that there are consequences of income source on spending in this situation. Furthermore, it is believed that households' decision-making regarding how to spend a finite budget can vary depending on whether they get remittances or not (Chami et al, 2003).

According to the "new economics of migration," families or households rather than lone individuals decide whether to migrate, particularly in developing nations. Households make selections in an effort to maximize expected income while simultaneously minimizing risk and restrictions brought on by market failures. The household is likely to diversify its resource allocation, including its labor supply, in order to achieve this. In that regard, members of the household could vote collectively to send a member to work in a nation where wages are not associated with wages in the country of residence (Graeme, 1993).

Remittances are, in theory, a form of income transfer to households, and as such, their natural outcome is an increase in their income and standard of living. Yet, the economic-widening impact of remittances, such as new work prospects, may have an indirect impact on disadvantaged households who are not migrants. The selection of the migrants, he continued, is intimately tied to the communities' prior past with immigration. Due to the considerable expense and risk involved in the migration process, individuals in relatively wealthy households are more likely to migrate in communities with limited prior migratory experience. With further experience, migratory

networks tend to appear, diminishing the cost and risk of the migration process, and hence making it possible for individuals in less wealthy households to migrate (Haas, 2007).

A straightforward model connecting the investment in human capital under financial restrictions and remittances is provided by Rapoport and Docquier (2006). People decide against enrolling in educational programs because they are too expensive and they are unable to use credit markets to cover the costs. But, if migrating to a country with high salaries is feasible, the funds sent by the migrants might enable their offspring to acquire school, raising their wages in the following era. Moreover, pay rates are expected to rise for the entire population if a significant fraction of the population completes a degree program (Rapoport, H. & Docquier, F, 2006).

For emerging economies, remittances have both advantages and disadvantages. One the one hand, remittances have a beneficial effect on the current account since they provide both foreign currency and extra savings for economic growth. An economy can spend more than it makes, import more than it exports, or invest more than it saves with the help of remittances. Remittances as a source of development finance also have some specific advantages because, unlike development loans, they are provided directly to the recipients rather than having to be repaid. Remittances can, however, harm growth potential by fostering a dependent on money. For example, like much unearned wealth, they may encourage idleness among those who receive them; intensify a continuing trend of migration of the working age population (McCormick, B and J. Wahba, 2000).

Gezahegne (2007) outlined the advantages and disadvantages of remittances. The benefits include lowering labor market pressures, increasing access to technology and global markets, reducing poverty, and being more countercyclical than traditional sources of revenue and foreign exchange. Remittances do, however, present a rare opportunity to build savings, migrants are vulnerable to exploitation and abuse, skilled workers are lost as a result of migration, and inequality is increased because migration is expensive and the poorest cannot afford it. It also causes real exchange rates to appreciate, which reduces export competitiveness, boosts wasteful consumption, and drives up real estate prices (Gezahegn, 2007).

Theories of Welfare and Its Measures

Making welfare comparisons between households is frequently required in the practical formulation of policy. Consideration of per capita income is one strategy. This is probably better,

but it's also unsatisfactory because various household members have varying needs and because there are returns to scale for many things, like heating. Scaling the incomes using equivalence scales is a frequent technique for comparing the level of material well-being of two families. The ratio of the incomes of two different household types that are thought to be at the same level of welfare is known as an equivalency scale. Total consumer spending is an alternative to income that is frequently favored since it is less subject to seasonal variations and measurement problems (Lind, 2000).

According to its composition, the household is described as a single agent that maximizes a utility function as a unitary decision-maker. This illustration of household decision-making is obviously overly simplistic. The term "welfare" is not well defined. But, for practical considerations, we will focus only on material well-being, which is a much more constrained definition of human welfare. First, it's simple to use, which makes it valuable for empirical purposes. Additionally, material prosperity is relevant for a variety of policy-making concerns, including deciding on transfers and taxation. Thus, the terms "welfare" and "material well-being" are interchangeable (ibid).

Many methods are employed to study intra-household behavior. According to one of the theories, the household maximizes a "household utility function" based on overall consumption. Yet, this is uncertain because it can be challenging to ascertain what is truly happening inside a family because families can include more than one person. Another strategy is to simulate a family as though it maximized the utility function of a specific actor, typically the husband. This implies that the utility function of the home is comparable to the utility function of this agent. In this scenario, the agent spends the remaining resources on himself after purchasing enough consumption products for household members to reach a specific necessary utility level. This mechanism is Pareto optimum. The second interpretation is that of Bojer (1977) as cited in Silesnick (1998). She assumes that some sort of social norm dictates that for each household member i and every good j, there is a number mij such that agent i gets a share mii f the household consumption of good j. Given this constraint, the head of the household maximizes his or her utility (Slesnick, 1998). The most commonly used approach is the Bergson- Samuelson welfare function (BSWF), which suggests the use of a BSWF to aggregate household preference (Slesnick, 1998). The alternative strategy is to model the entire intra-household decision-making process. Game theory is necessary in this situation, and both cooperative and non-cooperative strategies have been proposed. To decide on

household decisions, they employ various cooperative bargaining strategies, such as the Nash bargaining solution (Lunderberg, 1988). In this study, household welfare is calculated as a function that maximizes household utility while accounting for cost functions. By estimating each household's consumption expenditure adjusted in log per capita terms, I was able to compare intra-household welfare.

Empirical Literature Review

The effect of remittances on economic outcomes such as growth, inequality, income distribution, poverty, and population health indicators has been extensively studied in the literature. According to Russell, IMF's Country Assessments report, there is evidence that remittances from overseas are essential to the survival of communities in many developing nations (1990). In this study, it was discovered that once their basic requirements are met, migrants do use their remittances for investments in things like education, livestock, farming, and small businesses (Russel et al., 1990).

Remittances, according to Taylor (1999), have multiplier effects that raise national income (Taylor, 1999). Welfare is substantially impacted by migrant remittances. Remittances have a favorable impact on the welfare of left-behind families, according to a study by Koc and Onan (2001). (Koc I. and Onan I., 2001). Remittances to Ghana increase household wellbeing and lessen the effects of economic shocks on household welfare, while they are unable to fully balance the shocks save for food crop farmers (the country's poorest people) (Quartey, 2006).

Analyzing a large panel dataset of 154 developing countries over the period 1960-2010, it was found that dual citizenship-driven remittances positively affect classical welfare indicators such as child survival and life expectancy. The analysis suggests that foreign remittances improve household welfare by raising consumption (Ahmad, 2014). It was discovered through analysis of a sizable panel dataset including 154 developing nations from 1960 to 2010 that remittances caused by dual citizenship have a beneficial impact on traditional welfare measures like child survival and life expectancy. According to the analysis, household wellbeing is improved by overseas remittances via increasing consumption (Ahmad, 2014).

Migrant transfers are widely acknowledged to be a significant source of income for Ethiopian households. Remittances are primarily employed as risk-reduction tools and as protection against

external shocks (Aredo, 2005). According to a study on the income patterns of Ethiopian households from 1994 to 1997, a sizable proportion of those households were substantially dependent on remittances during that time. The total sample of households received an average transfer of more than ETB 500 in 2011, compared to a per-capita remittance of ETB 95 (about 11 US dollars) at the time (Bigsten et al, 2005; Beyene, 2011).

Another study found that foreign remittances considerably decreased the incidence of poverty among urban households in Ethiopia and that remittance shocks had a favorable impact on macroeconomic variables. They examined how overseas remittances affected the Ethiopian economy, household livelihoods, and wellbeing using macroeconomic data from the Ethiopian urban household survey (Emerta et al, 2010).

Andersson (2012) looked into how remittances affected rural Ethiopian households' welfare. The findings demonstrate a significant positive impact of remittances on the subjective well-being of households. He concludes that, in contrast to the influence of migration on subjective well-being, the effect of migration on household welfare is mediated by the effect of remittances on welfare (Anderson, 2012). Although there is no clear correlation between receiving remittances and spending on productive investments in rural Ethiopia, remittances have a favorable and considerable impact on spending on consumption. This suggests that migration and remittances are primarily employed as a temporary coping mechanism and rarely as a springboard to profitable economic opportunities (Solomon, 2012).

Method of the Study

The main source of data for this study relies on a structured questionnaire designed to collect unique primary data from urban households who reside in Addis Ababa. It employs a household population of 103,466 and 5 percent margin of error using Yemane (1967). Therefore, the sample size for this study is 400 households selected randomly from both groups.

In order to specify the empirical model let's first begin with the theoretical benchmarking for the development of such practical welfare models. Households are assumed to derive utility (U) from purchased consumption goods (G) and leisure (L), and the level of utility obtained from G and L

is affected by exogenous factors such as human capital (H) and other household characteristics Z (Weersink et al, 1998; Fernandez et al,2005).

Thus:

$$max\ U = (G, L, H, Z) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Utility is maximized subject to:

Time constraint: $T = Wt + Lt \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$

where Wt is working time and Lt is leisure time.

Production constraint:

$$Q = Q(X, H, A\ ) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

where X is productive inputs, H is human capital and A is exogenous variables that shift production function. Income constraint:

$$PgG = PqQ - WxX + WWt + R \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

This equation depicts the budget constraint on household income. Where; Pg denotes the price of goods purchased, PgG is the income available for the purchase of consumption goods, and it depends on the price (Pq) and quantity (Q) of output, price (Wx), and quantity (X) of inputs, wages (W) and the amount of time spent working (Wt) and exogenous household income such as government transfers, pensions and remittances (R). Substituting equation (3) into equation (4), we can find the new budget for households constrained by remittances.

$$PgG = PqQ(X, H, A\ ) - WxX + WWt + R \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

The Kuhn-Tucker first-order conditions can be obtained by maximizing Lagrangian expression ($\mathscr{L}$) over (G, L) and minimizing it over (λ, ɳ):

$$L = U(G, L, H, Z) + \lambda(PqQ(X, H, A\ ) - WxX + WWt + R - PgG) + ɳ(T - Wt - Lt) \ldots\ldots (6)$$

Where, λ and ɳ represent the Lagrange multipliers for the marginal utility of income and time, respectively. Solving the Kuhn-Tucker conditions, reduced-form expression of the optimal level of household income (Y*) can be obtained by;

$$Y* = Y(Wx, Pq, Px, A, H, Z, R, T) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

Moreover, household demand for consumption goods (G) can be expressed as;

$$G = G(A, Y*, W, P, H, Z, T) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (8)$$

Thus, the reduced forms of Y* and G are influenced by a set of explanatory variables, including R. The main aim of this paper is to estimate the effect of R on household income, household consumption of goods, and other related outcome variables such as food security and income.

Having said this, the empirical model helps to answer the research questions, and two types of related models are presented. The first one is an endogenous switching regression model that addresses selection bias and the second one is a treatment effect model to estimate the impact of remittances on recipients from receiving and non-recipients had they received.

Endogenous Switching Regression Model

The focus of this paper is to examine differences in the welfare outcome of households who get migrant remittances with those who did not. We first examine the differences in the determinants of welfare within recipients and non-recipient households. Then, we measure the impact of the remittances on recipient households' welfare outcomes.

A simplified model from linearizing the reduced form equation can be expressed as:

$$Y = \beta X + \Upsilon R + \mu \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots . (9)$$

Where y denotes income or other household well-being indicators such as food security and consumption expenditure. X is a vector of explanatory variables (other than remittance) that influences the outcome and R is a dummy for remittance that affects wellbeing or welfare. But, with this equation, we cannot compare welfare outcomes between groups of households who are recipients and non-recipients and the ordinary least square (OLS) regression technique may yield biased results.

In order to address these issues, we use the endogenous switching regression (ESR) technique. The endogenous switching regression analysis, also known as the Mover or Stayer model, is applied to situations where one wishes to establish the effect of being in one of two different positions (status, regimes, or states) on desired outcomes and the possibility of moving or staying in that particular position, regime or state (Tauer, 2005). In this study, the outcome of interest is household welfare and the two regimes or decision states are whether households are recipients of remittances or not. Remittance collection depends on households' joint decision to send a member of the household abroad in order to diversify their income sources and reduce risks.

Following Lokshin and Sajaia (2004), the first step in the switching regression model is to determine the factors influencing remittance collection among households based on a probit function specified as:

$$Ii* = \Upsilon Zi + \varepsilon 0i \text{ With } \quad Ii = 1 \; if \; Ii* > 1 \; and \; Ii = 0 \; otherwise \; \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (10)$$

Where Ii* is the unobservable or latent variable for households whether they received remittances or not and Ii is the observable counterpart (the dependent variable remittance collection which is equal to one if the household receives remittance in the survey year and equals zero otherwise). Zi Includes a vector of exogenous variables gender, age, level of education, number of dependents, household asset, and selected infrastructure variables that account for household differences in income generation that may affect reception as well as the level of household expenditures. Υ Are vectors of unknown parameters and $\varepsilon 0i$ is the disturbance term. The second step in the switching regression model is to define separate welfare functions for the two groups of households. Their welfare functions are expressed as:

$$Y1i = \beta 1X1i + \varepsilon 1i, if \; Ii = 1 \; \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (11)$$

$$Y2i = \beta 2X2i + \varepsilon 2i, if \; Ii = 0 \; \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (12)$$

Where Y1 and Y2 represent welfare functions for households who received remittances and those who do not, respectively, X1 and X2 are vectors of exogenous variables; β1 and β2 are vectors of parameters; and ε1 and ε2 are random disturbance terms.

The welfare of individuals or households is usually measured in terms of income or consumption. Both measures have their advantages and disadvantages. However, for developing countries consumption is commonly preferred, mostly due to practical reasons. As explained by Deaton (1997) consumption estimates are likely to be more accurate than income estimates in developing countries since the measurement problems of recall bias, price imputation, or the separation between business and household activities, are less acute for consumption than for income. Haughton & Khandker, (2009) would argue in favor of consumption as a more appropriate measure of welfare than income since the former is less susceptible to pronounce seasonal variations or unexpected shocks (Haughton, J. & Khandker, S. R., 2009). To reconcile these problems in this study, the proxy used to measure household welfare is both household consumption expenditure and household income adjusted by log of per capita units.

The underlying assumption here is that remittance is endogenous to household welfare. In addition, by splitting the sample into two, the problem of sample selection bias may arise. In order to deal with these challenges, the switching regression technique relies on the joint normality of the error

terms in the binary and continuous equations. The error terms, $\varepsilon 0i$, ε1i, and ε2i are assumed to have a trivariate normal distribution with zero mean and non-singular covariance matrix specified as:

$$\text{cov}(\varepsilon 0, \varepsilon 1, \varepsilon 2) = \begin{matrix} \delta 0^2 & \delta 01 & \delta 02 \\ \delta 10 & \delta 1^2 & . \\ \delta 20 & . & \delta 2^2 \end{matrix} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (13)$$

Where $\delta 0^2, \delta 1^2, \delta 2^2$ represent variances of error terms and $\delta 12.\ \delta 10, \delta 20$ are co-variances of error terms. The covariance between ε1 and ε2 is not defined as y1i and y2i are never observed simultaneously. Given the assumption with respect to the distribution of the disturbance terms, the logarithmic likelihood function for the system of equations 11 and 12 is:

$$lnL = \sum_i (IiWi \left[F\{\eta 1i\} + lnf\left\{\frac{\varepsilon 1i}{\delta 1}\right\}\right] + (1 - Ii)wi[ln\{1 - F(\eta 2i)\} + ln\left\{\frac{f\left(\frac{\varepsilon 2i}{\delta 2}\right)}{\delta 2}\right\} \ldots\ldots 14$$

Where F is a cumulative normal distribution function, f is a normal density distribution function, wi is an optional weight for observation i, and

$$\eta ji = \frac{\gamma Zi + \frac{\rho j \varepsilon ji}{\delta j}}{\sqrt{1 - \rho 2j}} wher\ j = 1{,}2$$

Where $\rho 1 = \delta 21u/\delta u\delta 1$ is the correlation coefficient between ε1i whereas ui and $\rho 1 = \delta 22u/\delta u\delta 2$ is the correlation coefficient between ε2i and ui.

Treatment-Effects Model:

A treatment-effects model was employed to establish the effects of remittances on household welfare. The treatment-effects model measures the effect of an endogenously chosen binary treatment (recipient or non-recipient of remittances) on another endogenous, continuous variable (household income or expenditure), conditional on two sets of independent variables. The treatment-effects model is executed by using a full maximum likelihood estimator. In treatment effects, the endogenous binary variable model is a linear potential-outcome model that allows for a specific correlation structure between the unobservable that affects the treatment and the unobservable that affect the potential outcomes.

More formally, we have an equation for outcome yj and an equation for treatment tj:

$$E(yj|xj,tj,\varepsilon j) = exp(xj\beta + \delta tj + \varepsilon j) \quad \ldots\ldots 15$$

$$tj = \begin{cases} 1, & wj\gamma + uj > 0 \\ 0, & otherwise \end{cases} \quad \ldots\ldots 16$$

The xj are the covariates used to model the outcome (welfare), wj are the covariates used to model treatment assignment (remittance), and error terms εj and uj are bivariate normal with mean zero and covariance matrix given below.

$$\begin{pmatrix} \delta 2 & \delta\rho \\ \delta\rho & 1 \end{pmatrix} \quad \ldots\ldots 17$$

The coefficients from the ESR model can be used to derive the expected values of well-being, which are then used in estimating the unbiased average treatment effect on the treated (ATT) and the average treatment effect on the untreated (ATU). The ATT compares the well-being of recipients with and without remittance while the ATU compares the well-being of the non-recipients with and without remittances. (Source: www.stata.com, 2013)

The following conditional and unconditional expectations can be predicted by mspredict command from Stata to estimate average treatment effects.

The unconditional expectation:

$$E(y1i|x1i) = x1i\beta 1 \quad \ldots\ldots (18)$$

$$E(y2i|x2i) = x2i\beta 2 \quad \ldots\ldots (19)$$

Conditional expectations

The expected value of well-being for the recipient household is

$$E(y1i|Ii = 1, x1i) = x1i\beta 1 + \frac{\sigma 1\rho 1 f(\gamma Zi)}{F(\gamma Zi)} \quad \ldots\ldots (20a)$$

The expected value of the well-being of the same household had it was non-recipient is

$$E(y1i|Ii = 0, x1i) = x1i\beta 1 - \frac{\sigma 1\rho 1 f(\gamma Zi)}{\{1 - F(\gamma Zi)\}} \quad \ldots\ldots (20b)$$

The expected value of well-being for the non-recipient household had it been a recipient

$$E(y2i|Ii = 1, x2i) = x2i\beta 2 + \frac{\sigma 2\rho 2 f(\gamma Zi)}{F(\gamma Zi)} \quad \ldots\ldots (20c)$$

The expected value of well-being for the non-recipient household is

$$E(y2i|Ii \ = 0, x2i) = x2i\beta 2 \ - \frac{\sigma 2\rho 2f(\gamma Zi)}{\{1 - F(\gamma Zi)\}} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots..(20d)$$

ATT (Average Treatment Effect on the Treated) is equal to (20a) -(20b), which shows the change in well-being as a result of remittances. ATU (Average Treatment Effect on the Untreated) is equal to (20c) -(20d), which measures the change in well-being for non-recipients had they received any remittances.

Estimation Techniques:

The most common suggested methods for addressing sample biases include Heckman selection, instrumental variable (IV), and propensity score matching (PSM) techniques. However, each of these methods has some limitations. For example, both Heckman selection and IV methods tend to impose a functional form assumption by assuming that remittance has only an intercept shift and not a slope shift in the outcome variables (Alene and Manyong, 2007). Though PSM tackles the above problem by avoiding functional form assumptions, it assumes selection is based on observable variables, but there is likely to be unobserved heterogeneity because households' innate abilities, skills, information, and motivation are likely to influence remittance gain. PSM, therefore, produces bias results when there are unobservable factors that influence both remittances and the outcome indicators.

Nonetheless, both of these estimation methods are inefficient and require potentially cumbersome adjustments to obtain consistent standard errors. The chosen estimation technique for this analysis is the move stay command that implements the Full-Information Maximum Likelihood Method (FIML) to fit simultaneously binary and continuous parts of the model in order to yield consistent standard errors. This approach relies on the joint normality of the error terms in the binary and continuous equations (Lokshin, 2004; Sajaia,2004). The estimates generated through this technique include the inverse Mill's ratio (mills1 and mills2), which measures the ratio of the ordinate of a standard normal to the tail area of the distribution and reflects the probability that an observation belongs to the selected sample (Heckman, 1979).

The FIML estimates of the parameters can be obtained from the move stay command in Stata. In addition, for identification purposes, it is followed the usual order condition that Zi contains at

least one element not in Xi imposing an exclusion restriction on equation (10). These variables do not have any direct effect on household income and consumption expenditures, although they are hypothesized to affect the probability that the household receives remittance.

Results and Discussions

In this section, data collected through a survey questionnaire is systematically presented, analyzed, and discussed in line with addressing the specific objectives of the study. We have followed two approaches. First, a descriptive approach is followed where the socio-economic and demographic characteristics of households are compared among RRHs and NRRHs. In this part of the analysis, the elements and subjective welfare impacts of remittances are discussed. The second approach is an application of econometrics (endogenous switching regression model) to estimate the impact of remittances on income, consumption, and food expenditures.

In this section, the variables are defined and used to regress the impact of remittances on the welfare indicators of households.

Table 1

Definition of Variables

Variables	Description
Treatment variable	
Remittance	A household received remittances in the last 12 months
Explanatory variables	
Age	Age of household head (years)
Gender	Gender of household head (1=female)
Household size	Number of household members (number)
Dependency ratio	The ratio of members aged below 15 and above 64 to those aged 15-64 (ratio)
Education	Education level of household head (years)
Employment	Number of household members employed (no.)
head-self-employed or employer	A household head is self-employed or employer
Head-hired	A household head is hired employee
Head-unemployed	Household head is without job
Head-other	Household head is pensioner, housewife, student etc
House	A household owns a house (=1 if it owns)
Land	A household owns land (=1 if it owns)
Auto –truck	A household owns automobile or trucks (=1 if it owns)
Bank distance	Distance to nearest commercial bank (meter)
Bank visit	Number of times a household goes to bank per month
Religion	Dummy of 1 if household is Christian and 0 otherwise
City	A household is originated in Addis Ababa (=1 for AA)
Head-Married	A household head is married (dummy of 1 if married)
Outcome variables	
Household income	Log of total household income per capita in the survey year (ETB)
Consumption expenditure	Log of total household consumption expenditure per capita per year (ETB)
Food consumption expenditure	Log of total food consumption expenditure per capita per year

Source: Own design based on literature

The descriptive analysis revealed significant differences in some of the well-being indicators between recipients and non-recipients of remittances. In addition, households' perception shows potential positive effects of international remittances. To properly analyze the impacts of remittances, we use an econometric technique the, FIML ESR. The FIML ESR model involves a

selection equation and separate outcome equations for RRHs and NRRHs, which are estimated simultaneously. The selection equation is about the determinants of the probabilities of receiving remittance. Two of the exclusion restriction variables, religion, and the number of jobholders are statistically significant in all the models that satisfy the instrument relevance condition. Let us now look at the results for each of the outcome indicators.

Household Income Effects:

The full information maximum likelihood estimates of the endogenous switching regression model (FIML- ESR model) for household income equations are presented in Table 2. The result shows how each of the explanatory variables affects income, which is one of the indicators of household welfare. The correlation coefficients between the error terms of the selection and outcome equations ($\rho 1$ & $\rho 2$) reported provide an indication of selection bias. A statistical significance of any of them suggests that self-selection would be an issue if not accounted for. Since $\rho 1$ is positive and significantly different from zero, the model suggests that households who received remittances earn a lower income than a random household from the sample would have earned, and those who did not received remittances do not get better or worse than a random household does since $\rho 2$ is not significant. The variables sigma, /lns1, /lns2, /r1, and /r2 are ancillary parameters used in the maximum likelihood procedure. Sigma1 and sigma2 are the square roots of the variance of the residuals of the regression part of the model, and lnsig is its log. /r1 and /r2 are the transformation of the correlation between the errors from the two equations. The significance of the likelihood ratio tests for independence of equations also indicates that there is joint dependence between the selection equations and the income equations for recipients and non-recipients.

The estimation result shows that household education and ownership of assets (automobile and trucks) significantly affect the household income of both remittance-receiving households and remittance not receiving households (RRHs and NRRHs). An increase in the level of education of a household head increases the income of the household and ownership of automobile and trucks contributes positively to household income. There are differences in what determines household income between RRHs and NRRHs. For example, household size and head marriage are significantly associated with the household income of non-recipients, but the effects are

insignificant among recipients. Conversely, house ownership significantly influences the income of only RRHs.

Table 2

Impact Remittance on Household Income –Results of ESR Model

	Remittance (selection)		Household income per capita (log)			
			RRHs		NRRHs	
Explanatory variables	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Age	0.052631	.0402283	.0213384	. 0374666	-.0436846	.030107
Age2	-.0003879	.0003878	-.0001547	.0003574	. 000432	.0002886
Gender	.1728072	.2028499	.0785219	. 1931198	-.1093264	. 138624
Household size	-.0196977	.0878703	-.0978061	.071183	-.108076**	. 053664
Dependency ratio	-.0019161	.0015697	-.002398*	.0014875	-.0002187	. 001032
Married	.124641	. 1878509	. 2111497	. 17879	-.20067*	. 119813
Own house	. 0611037	. 2145496	. 42011*	. 2167866	. 2100947	. 132886
Own land	. 206942	. 3423497	-. 012323	. 3003851	. 1628765	. 279013
Own auto-truck	.1292553	. 2505214	. 43572*	. 2401592	. 79506 ***	. 160781
Education	-.03417*	. 0175132	.037793**	0162091	. 053315***	. 013487
self-employed	-1.33177**	. 5762792	-.6856992	. 5186348	-.4174264	. 378746
Hired	-1.69404***	.5877923	-.7758726	. 5348738	-.4288617	. 412659
Unemployed	-1.8801***	.6341295	. 5511361	. 579587	-.2087649	. 453626
Others	1.022475**	. 5338927	. 4844201	. 4996383	-.4211852	. 289043
City	-.1766199	.1830511	-.1528103	1719808	-.0559249	. 118777
Religion	.4992565***	.1890125	-	-	-	-
No of job holders	-.144448*	.0766805	-	-	-	-
Distance to banks	.0000388	.000035	-	-	-	-
No of bank visits	-.0127048	.01627	-	-	-	-
Constant	.3332238	1.091617	9.34540***	1.026449	11.07339***	. 725930
σ1, σ2			.9485153	.111649	.6041827	.0677059
ρ1, ρ2			.8849402***	.0717233	-.2813546	.5706904
Log likelihood	-395.24516					
Lr test of ind. Eqns.(rho1=rho2=0) chi2(1)=7.90 prb>chi2=0.0049***						

Notes: ***, **, *represent 1%, 5%, and 10% significant levels, respectively.
Source: Estimation Result

Household Consumption Expenditure Effects

The natural logarithm (ln) of a household's per capita expenditures as a dependent variable was utilized as a standard approach when modeling the expenditures function. The results are presented in table 3. The results show that household age and its square significantly affect the consumption expenditure of both groups of households. Age has a negative sign while its square is positive indicating that consumption is higher during old age. The other common factor that affects consumption expenditure positively is education. This justifies that households that are more educated generate more income and expend more than their uneducated counterparts expend. The results show some differences between recipients and non-recipients with respect to some of the explanatory variables. For example, ownership of automobile and trucks and the marital status of the household head affect consumption expenditure of NRRHs positively and negatively, respectively. However, these variables do not have any impact on the expenditure of RRHs.

The statistical significance of the correlation coefficient $\rho 1$ suggests that there are selection effects hence unobserved factors affect both the probability of receiving remittances and household consumption expenditure. Particularly there is a negative selection bias only for recipients as $\rho 1$ is negative and significant while $\rho 2$ is not statistically significant. Thus, households that receive remittances have above average consumption expenditure per capita, while those who did not receive remittances are not better or worse off than a random urban household is. The significance of the likelihood ratio tests for independence of equations also indicates that there is joint dependence between the selection equations and the income equations for recipients and non-recipients.

Table 3

Impact Remittance on Household Consumption –Results of ESR Model

	Remittance (selection)		Household consumption per capita (log)			
			RRHs		NRRHs	
Explanatory variables	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Age	. 0579571	. 0412219	-. 0604683*	. 0332567	-.089710***	.0297724
Age2	-.0004464	. 0004043	. 0005419*	. 000315	. 000822***	. 000292
Gender	. 087691	. 2005593	-.1363165	. 1665736	. 2267787	. 146748
Household size	-.1860368**	.0829756	-.0813827	. 0583775	. 0310765	. 058266
Dependency ratio	-.0015865	. 0015413	-.0005192	. 0012431	-.0011027	. 001078
Married	.018623*	.1868515	-.0518655	. 1536068	-.2250204*	. 131689
Own house	. 1215897	. 2109812	-.0080472	. 177362	-.1023166	.1467678
Own land	.4030682	. 3442094	. 1382555	. 2535017	. 2495392	. 291458
Own auto-truck	.0426489	. 2417564	. 0633359	. 1978524	. 5104358**	. 172252
Education	.0250459	. 0168847	. 0253278*	. 0137202	.0255263**	. 012572
self-employed	-.3549731	. 2691342	. 0729505	. 2083637	. 008434	. 236100
Hired	-. 608009**	. 2434721	. 1456917	. 194275	. 0341679	. 222675
Unemployed	-.7823302**	. 3158905	. 3784416	. 2574864	. 2631143	. 267151
Others	Dropped	-	-	-	-	-
City	-.0109917	. 174363	. 1653433	. 1433526	. 0305167	. 127392
Religion	. 2591532*	. 156332	-	-	-	-
No of job holders	. 190940***	.0676333	-	-	-	-
Distance to banks	. 000048	. 0000374	-	-	-	-
No of bank visits	. 002389	. 0136942	-	-	-	-
Constant	-.9225511	.9591329	12.2881***	. 8467643	11.6015***	. 666363
σ1, σ2	-	-	.8110028*	. 0967662	. 684076**	. 085675
ρ1, ρ2	-	-	-.92965***	.0560846	-.5162278	. 295576
Log likelihood	-379.99982					
Lr test of ind. Eqns.(rho1=rho2=0) chi2(1)=8.33 prb> chi2=0.0039***						

Notes: ***, **, *represent 1%, 5%, and 10% significant levels, respectively.
Source: Estimation Result

Households Food Expenditure Effects:

Food security and nutrition is other dimensions of welfare, which can be captured by the amount of money expend for the purchase of food items only. The result of ESR model indicates that there is a difference in the determinants of food expenditure among recipient and non-recipient households. As table 4 shows that female-headed households consume less than male-headed households for NRRHs but the effect is insignificant for RRHs. Similar to the above two scenarios ρ1 is negative and statistically significant which accounts for selection bias. In other words,

households who receive remittances are food secure compared to a random individual in the sample. However, it is indeterminate for non-recipient households since ρ2 is insignificant.

Table 4

Impact of Remittance on Food and Nutrition

	Remittance (selection equation)		Household food expenditure per capita (log)			
			RRHs(remittance=1)		NRRHs (remittance=0)	
Explanatory variables	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Age	. 0645911	. 042114	-.0595396*	. 0355469	-.0713402**	. 034915
Age2	-.0005187	.0004075	. 0005336	. 0003362	. 0007034**	. 003248
Gender	. 1532162	. 2048711	-. 2023783	.1789751	-.3008581*	. 153858
Household size	-.16153***	. 0907264	-. 0885995	. 063853	. 0179634	. 063327
Dependency ratio	-.0013143	. 0015599	. 0004299	. 0013725	-.0008188	. 001212
Married	. 0787372	. 1889719	-.1037207	. 1653662	-.2519529*	. 133451
Own house	. 0879756	. 216177	. 1262412	. 2000864	-.0874003	. 148289
Own land	. 3796962	. 3561741	. 1494208	. 2751548	. 146114	. 324596
Own auto-truck	. 0404623	. 2522149	.0858927	. 2194191	. 3618362**	. 177390
Education	-.0272352	. 0175321	. 0285931*	. 01499	. 0208391	. 015314
self employed	-.3256901	. 2815789	. 0187295*	. 2296632	-.0805659	. 280031
Hired	-.6435694**	. 2527107	-.0284418	.2157055	-.0279845	. 328761
Unemployed	-.789211**	.3336019	. 5082158*	. 2828739	. 2383598	. 412309
Others	-	-	-	-	-	-
City	-.0639925	. 1917446	. 1762675	. 1602903	. 0172142	. 132298
Religion	. 301223***	. 1844943	-	-	-	-
No of job holders	. 148726***	. 0820001	-	-	-	-
Distance to banks	.0000166	.0000481	-	-	-	-
No of bank visits	-.003192	. 0158977	-	-	-	-
Constant	-1.018225	. 967889	11. 356 ***	. 9055045	10. 693***	. 749073
σ1, σ2	-	-	.8397046 **	.1070384	. 678357**	. 137459
ρ1, ρ2	-	-	-.803337**	. 1182432	-.3634239	. 849019
Log likelihood	-406.48215					
Lr test of ind. Eqns.(rho1=rho2=0) chi2(1)=3.74 prb> chi2=0.0533*						

Notes: ***, **, *represent 1%, 5%, and 10% significant levels, respectively.
Source: Estimation Result

Treatment Effects

A treatment effect is a change in the outcome (welfare) caused by an individual getting one treatment (remittance) instead of another. We cannot estimate individual-level treatment effects but average treatment, because we observe only each individual getting one or another treatment. Three parameters are often used to measure treatment effects: the average treatment effect (ATE),

the average treatment effect on the treated (ATT), and the average treatment effect on the untreated (ATU).ATE measure the effect of remittance on the whole sample of households, ATT measures the effect of remittance on sub-samples of recipients and ATU measures the effect of remittance on non-recipients had they received it. After running the endogenous switching regression model, the expected welfare outcomes in both actual and counterfactual conditions are predicted. Only the results of ATT and ATU are reported in table 5 to make possible comparisons between sub-samples of households.

Table 5

Treatment Effect of Remittances

Cells	Outcome variables	Categories	Decision stage		Treatment Effect
			Receiving	Not Receiving	
(a)	Household Income per Capita (log)	Recipients	1.342 (.2987)	1.320(.304)	ATT=0.022***
		Non-Recipients	1.298 (.302)	1.281 (0.453)	ATU=0.017***
(b)	Consumption Expenditure per Capita (log)	Recipients	1.125 (.2373)	1.007(.2717)	ATT=0.118***
		Non-Recipients	1.102(.229)	1.011(.258)	ATU=0.091***
(c)	Food Expenditure per Capita (log)	Recipients	1.038 (.247)	.976(.257)	ATT= 0.062***
		Non-Recipients	1.018(.242)	.965(.253)	ATU= 0.053***

Notes: ***, **, * represents 1%, 5% and 10% level of significance, respectively
Source: author's estimation from household survey data

The estimates of the treatment effects of remittances on household income are presented in cell (a) of Table 5. The predicted household income per capita from the ESR models (using mspredict command from stata13) is used to compute both the ATT and ATU. The ATT measures the difference between the mean income of recipients and what they would have earned if they had not received it, while the ATU indicates the difference between the mean income of non-recipients and what they would have obtained if they had received it. The results show that remittance has a positive and significant effect on the household income of the recipient households. Specifically, remittance increases the log of per capita income by 2.2% and this is statistically significant. The significance and positive value of ATU estimate suggest that households that did not receive

remittance would have generated even higher income benefits had they actually received any funds. If urban households in Addis Ababa that did not receive remittances had received, they would have increased their per capita income by 1.7%. Overall, both recipients and non-recipients would drive income benefits from remittances.

The results for the treatment effect of remittances on consumption expenditure per capita are presented in cell (b) of the above table. Households who received remittances increased their consumption expenditure by 11.8% and it is statistically significant. This implies that the positive income effect of remittances reported above is also transmitted into household consumption. Non-recipients' consumption expenditure would also be higher by 9.1% if they had received it. Compared to ATT, the small magnitude of ATU may suggest that households have other important sources of consumption.

As evident from cell (c), remittances play a key role in food insecurity reduction among recipients. The ATT estimate suggests that the remittance significantly caused an increase in food consumption expenditure per capita by about 6.2% for recipient households, which further confirms the positive food security effects of remittance. Although small in magnitude the ATU suggests that non recipients of remittances would be better off if they had received remitted funds. The result is statistically significant and food consumption expenditure would increase by 5.3% for non-recipients if they were recipients.

The findings of this study is supported by the remittance-optimistic developmental school which argues international remittances have the potential of enhancing the development process by positively contributing to the elimination of production and investment constraints through direct financing of critical developmental projects, increasing the average household incomes, reducing balance of payment problems, facilitating debt servicing and narrowing the trade gap of developing countries. Furthermore, the result confirmed that the decision-making process of how to spend a limited budget of the household can be different when households receive remittances than when one is not received.

Conclusion and Policy Implications

The main analytical framework adopted by this study is an endogenous switching regression model to account for endogeneity problems due to unobserved household characteristics. This model is also supported by a treatment effect model to make average outcome measures comparable between groups.

Although the highest share of remittance is trucked by formal money transfer agents, still informal agents or individuals play a key role in transferring remittances. 14% of the sampled households get their incomings from informal channels. The highest share of households receive remittances irregularly demonstrates the widespread view that remittances are used as a short-term coping strategy with unexpected economic shocks. In addition, the maximum share of received fund is used for food and nonfood expenditures. In fact, a significantly large proportion of remittances to households studied is used for directly productive purposes like businesses, reconstruction, and building of a new house and education.

There is also a difference in the significance, value, and direction of determinants of welfare outcomes. For instance, the main determinants of household income for the whole sample includes household head education, sector of employment (self-employed, Unemployed, hired employee, and pensioner/homemaker), and instrumental variables; religion and number of job holders. However, the determinants of household income for remittance receiving households (RRHs) are dependency ratio, ownership of assets (house and automobile or trucks), and level of education while the determinants of household income for non-remittance receiving households (NRRHs) are household size, head marriage, asset ownership (automobile or trucks) and level of education. Age and its square plus levels of education significantly affect household consumption expenditure of both groups. Their food consumption expenditure is commonly affected by age and education level. Gender, marital status, and assets significantly determine NRRHs food expenditure while employment status affects food expenditure of RRHs.

The welfare benefits for both recipients from receiving (Average Treatment on the Treated) and non-recipients had they received (Average Treatment on the Untreated) are estimated using a treatment effect model. A significant and positive value of ATT and ATU were found on the three of outcome measures (income, consumption, and food expenditure).These show that remittances

have positive and significant impact on the welfare of both remittance recipient households and; non-remittance recipient households if they were recipients.

Remittances to households in Ethiopia have a positive influence on the welfare of households. Based on the findings of the study the following policy options are recommended: The government of Ethiopia in collaboration with banks and money transfer agents should devise appropriate policy and strategies in order to diversify payment instruments, for instance, every bank made payments to their customers only in birr notes, no way to get dollars except the black market. Diversification would increase the sender's confidence to get back their currency when needed and improve remittance inflow. Since working abroad brings better welfare to once family, the state of Ethiopia should improve and strengthen its relationships with the rest of the world, especially the major origins of the Diaspora. The financial sector should be developed and the channels of remittances should be diverted from the informal sector to the formal sector to reduce costs and better benefit from remittances. This will help the government by generating additional funds to finance its development and poverty reduction strategies. Although remittance improves the welfare of households, the government and other stakeholders should bring opportunities to invest the remitted money in order to reduce remittance dependency.

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