MEMORANDUM

The Effects of International Remittances on Poverty and Inequality in Ethiopia

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The Effects of International Remittances on Poverty and Inequality in Ethiopia

Berhe Mekonnen Beyene[†]

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Abstract

The paper studies the effects of international remittances on poverty and inequality in Ethiopia using an urban household survey from 2004. In order to identify the effects of remittances on poverty and inequality, counterfactual consumption in the hypothetical case of no remittance is estimated in a selection corrected estimation framework. Inequality and poverty values in the hypothetical and actual cases are then compared. There is a significant reduction in poverty while inequality does not change. The head count, the poverty gap and the squared poverty gap ratios decreased by 2.5%, 1.1% and 0.6% respectively.

Key words: remittances, poverty, inequality, Ethiopia

JEL Classification: F-24, I-32, O-15

I.   Introduction

International remittances are becoming increasingly important sources of finance for developing countries. According to World Bank (2011) estimate, the total amount of international remittances sent to developing countries in 2008 was 325 Billion USD while the foreign direct investment (FDI) for the same year was 593 Billion USD. East Asia and the Pacific received the highest amount of 86 Billion followed by South Asia with 72 Billion while Sub-Saharan Africa received only 21 Billion.[1] Remittance flows remained resilient in the recent financial crisis despite the common worry that they would fall sharply. The total remittance flow to developing countries decreased only by 5.5% between 2008 and 2009 and in 2010 it recovered to what it was in 2008. In contrast, FDI dropped by 40% between 2008 and 2009. In 2008, the total official remittance flow to Ethiopia was 387 Million USD which was 1.5% of the annual GDP in that year. Even if the remittance flow to Ethiopia is low its growth is remarkable; just between 2006 and 2008 it more than doubled.

Remittances can boost economic growth by increasing aggregate consumption and investment on top of serving as stable sources of foreign currency (Anyanwu and Erhijakpor, 2010). At micro level, remittances improve the welfare of the receiving households by increasing their income and consumption.[2] Depending on how they are distributed, remittances can also affect poverty and inequality.

To the extent that poverty reduction is a top priority to many developing countries, it is important to understand how poverty is affected by remittances. It is also important to know the impact of remittances on inequality. Inequality will decrease if remittances are skewed in favor of the low income households. While lower inequality is good by itself, it also promotes growth by increasing the number of people who are not financially constrained to invest on physical and human capital. High inequality on the contrary slows growth by lowering investment (Furman and Stiglitz, 1998; Easterly, 2007) and makes a pro-poor growth less successful as the poor will be less likely to benefit from growth (Ravallion, 2001; 2005). In the long run, high inequality can

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[1] It is worth noting that the World Bank estimate is based on formal transfers and hence is bound to underestimate the actual size of remittances.

[2] There are also some evidences that remittances serve as insurance against crop failure (Yang and Choi, 2007) and are invested on physical and human capital (Adams, 2006; Adams and Cuecuecha, 2010; Edwards and Ureta, 2003). But remittances may also create a moral hazard problem of increasing unemployment or lowering work efforts (Grigorian and Melkonyan, 2008; Acosta, 2011) thereby reducing the positive effects.

also destroy institutions (Cramer, 2003; Glaeser et al, 2003). Thus, if remittances aggravate inequality, there will be various negative consequences which dampen, if not totally reverse, the positive effects.

Some studies have been done on the effect of remittances on poverty and inequality using household surveys and the result so far is not conclusive and varies from study to study. Most of the studies concentrate on Latin America where remittances are very common. There are few studies on Africa. This paper studies the effects of remittances on poverty and inequality in Ethiopia using an urban household survey collected in 2004.

Studying the effects of remittances on poverty and inequality has a number of empirical challenges. The first issue is how to treat remittance relative to other income. If remittance is considered as exogenous addition to household income, the task will simply be to compare poverty and inequality with and without remittance (for example see Gustafsson and Makonnen, 1993). But since remittance is the outcome of migration, it is not exogenous addition; rather, it is a replacement for the income the migrant would earn at home. In addition, remittance can also have indirect effect on household income. This calls for counterfactual income estimation in the hypothetical case of no migration and no remittance. Poverty and inequality measures in the actual and counterfactual scenarios will then be compared (Adams, 1989).

If remittance receiving households are randomly drawn from the whole population, the consumption function can be estimated using OLS regression. But migration is a selective process and hence remittance receiving households might not be random draws of the whole population. If recipient households are selected in their unobservable characteristics, the OLS estimates will be inconsistent and the result will be misleading. Thus, in this paper I use a counterfactual estimation technique that takes into account the possible selection into migration and remittance. More specifically, Heckman's two stage selection method is employed. In the first stage, the probability of not receiving remittance is estimated using Probit method and the information is used in the second stage consumption estimation.

Such estimation requires an exclusion restriction, i.e., there should be at least one variable that affects the probability of not receiving remittance but does not have any direct effect on consumption. This is not an easy task because the two variables are closely related. So far, age of household head (Adams, 2006), wealth and community level fraction of remittance recipients

(Acosta et al, 2008); and district level concentration of major ethnic groups (Gubert et al, 2010) have been used as instruments for the likelihood of being in the non-remittance group.

In this paper, I use religion as an instrument. More specifically, I include a dummy variable for Muslim households. The rest, which includes mainly Orthodox Christians, will be the control group. Due to the geographic proximity, the Middle East, which is a predominantly Muslim region, is the most important destination for Ethiopian migrants. Muslim households are expected to have better network with the Middle East and hence acquiring information about migration will be easier for them. Muslim migrants also assimilate easily due to the similarity in religion. Thus, Muslim households are more likely to have migrant members abroad and hence receive remittance. Religion is assumed not to have any direct effect on consumption. Both Islam and Christianity coexisted in Ethiopia for a long period of time and there is no clear difference between the two categories of people in terms of life style and economic opportunity, especially in urban areas. If there is any difference, it will be captured by observable characteristics like region, ethnicity, and household level human capital variables. The findings from this paper show that remittances led to a significant reduction in poverty while inequality remains the same.

The rest of the paper is organized as follows. Overview of remittance in Ethiopia is presented in section two. Section three reviews existing evidence on the impact of remittances on poverty and inequality. Section four presents the empirical strategies employed. In section five, data and summary statistics are given. The regression results are reported in section six while section seven presents the main results. The last section provides conclusions.

II.   Overview of Remittances in Ethiopia

The total stock of Ethiopian emigrants living abroad in 2009 is estimated to be 0.6 million which is 0.7% of the total population of 82 million in the same year (World Bank, 2011). The three major destinations are Asia, North America, and Europe hosting 38%, 31% and 21% of the total stock of emigrants respectively (UNDP, 2009). Within Asia, the Middle East is the most important destination for Ethiopian emigrants due to its geographic proximity and nature of the labor market. It is particularly common for young women to go to the Middle East to work mainly as domestic workers (Kebede, 2002; Fransen and Kuschminder, 2009).

Like migrants from all developing countries, Ethiopian migrants send money to their families back home. Even though Ethiopia is not among the highest remittance receiving countries, the

volume of remittance that flows to Ethiopia increased remarkably in the last decade. In 2001, the total official flow of remittances was only 18 Million USD. In 2004, which is the year when the survey for this study was conducted, it reached 134 Million USD and was 7% of export earnings and 1.3% of GDP. In 2008 it reached 387 Million USD and was the 8th highest in Sub-Saharan Africa. It was 15% of export earnings and 1.5% of GDP. This shows the growing importance of remittances to Ethiopia which is also true for many developing countries. In 2009, it decreased by about 9% to 353 million USD due the global financial crisis. According to the UNDP (2009) report, North America is the most important source of remittances to Ethiopia with a 41% share of the total flow followed by Europe with 29%. Asia, which hosts the highest number of Ethiopian migrants, contributes only 24% of the remittance flow. This could be because migrants residing in North America and Europe earn more income and hence remit more compared with those living in Asia.[3]

The trend of total remittance flow to Ethiopia in the last decade is shown in Figure 1 while remittance flow as a percentage of GDP is presented in Figure 2. The volume of remittance increased sharply in the last decade. However, remittance as a percentage of GDP is low in general and did not grow much because the GDP growth in those years was also very high. It is also partly because the remittance amounts are not adjusted for inflation.

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[3] But it could also be because larger fraction of the remittance from Asia flows through informal channels and is not accounted for by official data. I will return to the questionable nature of official remittance figures in section 4 in connection with the summary of remittance amounts from the survey.

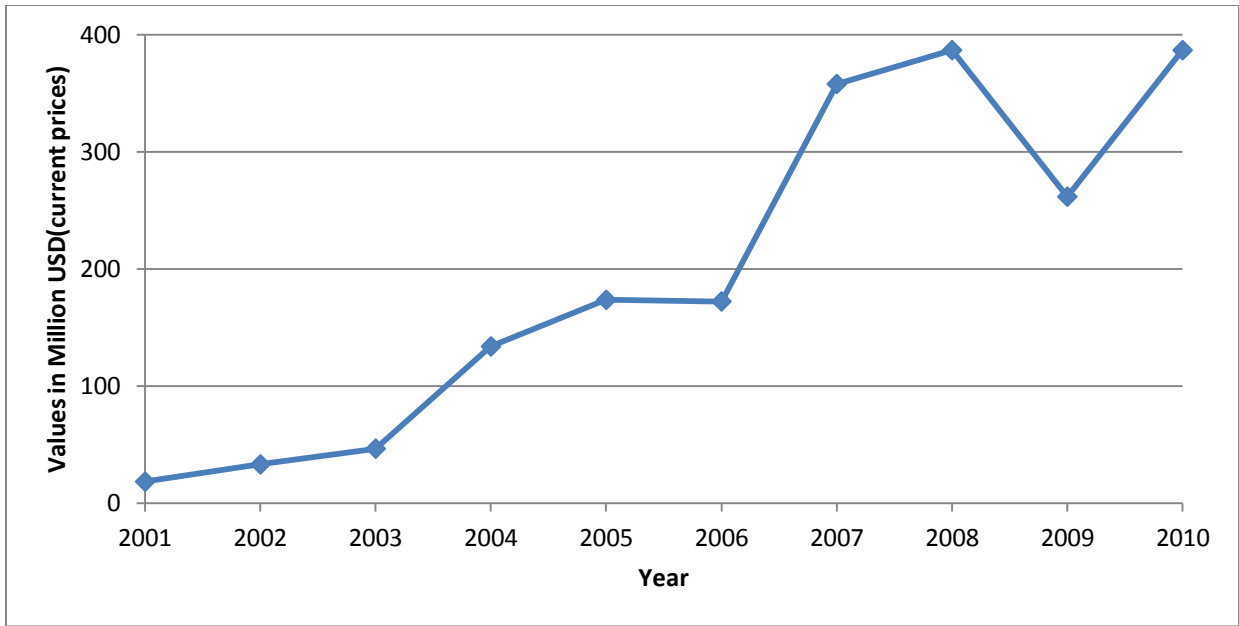**Figure 1.** Remittance Flow to Ethiopia (2001-2010)

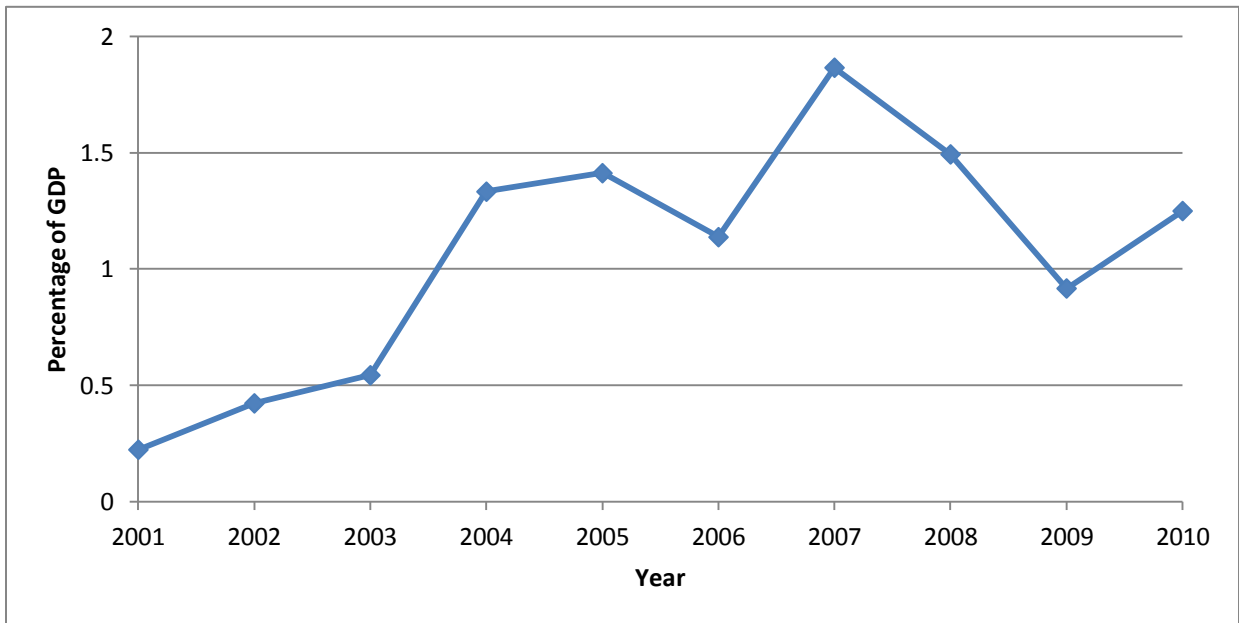Source: World Bank, World Development Indicators (various years)

Figure 2. Remittance as a Percentage of GDP (2001-2010)

Source: World Bank, World Development Indicators (various years)

III. Summary of Existing Evidence

One of the most obvious and direct effects of remittances in the receiving country is change in the distribution of income which in turn may affect poverty and inequality. While the poor have more need to send their members abroad as a mechanism of improving their welfare, they are less likely to realize it in the absence of well functioning credit markets because migration is usually expensive. Thus, the effect on poverty and inequality is not clear and depends on the specific context. In general, cost of migration is lower in countries where there is longer history of migration because of the information and other supports past migrants give to future migrants (Massey, 1990; Massey and Espinosa, 1997; Mckenzie and Rapoport, 2007). As a result, remittances are likely to be more poverty reducing and more equalizing (or less unequalizing) in countries with longer migration history.

Gustafsson and Makonnen (1993) studied the effect of remittances on poverty using data from Lesotho. They treated remittances as exogenous additions to income and compared actual poverty measures with the counterfactual ones where remittances are assumed to be zero and the migrants are back home with no income. The result shows that remittances decreased poverty substantially. But their approach has a weakness in its assumption that migrants have no earning capacity should they stay at home.

Adams (1989) used the counterfactual estimation method for the first time to study the impact of international remittances on inequality in rural Egypt. He first estimated income for those households who do not have migrant members abroad. The estimated equation was then used to calculate the counterfactual income for remittance receiving households in the absence of migration and remittance. Similarly, actual income (including remittances) was estimated for the whole sample where having a migrant member is included as a regressor. Then, inequality measures were compared for the two scenarios and it was found that remittances increase inequality because they were received mainly by the upper income villagers. The Gini coefficient rose from .20 to .24 for per capita income and from .24 to .27 for household income.

Using similar approach, Rodriguez (1998) found that remittances increased inequality significantly in Philippines as reflected by a rise in the Gini coefficient from .29 to .31. Using a slightly different approach, Brown and Jimenez (2008) found that remittances decreased poverty in Fiji and Tonga while the effect on inequality is negligible. In Fiji, where 43% of the households receive international remittance, the head count and the poverty gap ratios

respectively fell from .49 to .34 and from .17 to.15. In Tonga, where 90% of the sample households are remittance recipients, the head count and poverty gap ratios dropped from .62 to .32 and from .27 to .12 respectively. Interestingly, they found that the effect on poverty is smaller in the case where remittances are considered as exogenous additions to household income implying that remittances also have indirect positive effects on income.

The above studies used OLS regressions to estimate counterfactual income/consumption function and did not take into account the possibility that remittance receiving households might be a selected group. But there are also few studies which address the selection issue. In their study of the effect of remittances on inequality in Nicaragua, Barham and Boucher (1998) used a double selection method (for migration and labor force participation) to estimate counterfactual income in the case of no remittance. Using the results of the selection controlled income estimates for non-remittance receiving households (though they did not find evidence of selection), they estimated counterfactual income for remittance receiving households. To account for the artificially less volatile predicted counterfactual income compared with the actual one, they included error components drawn from the predicted consumption equation. They found that remittances increased inequality as reflected by a rise in the Gini coefficient from .38 to .43.

Using similar method, Acosta et al (2008) found that remittances reduced both inequality and poverty in 10 Latin American and Caribbean countries. The selection result shows that migrant households are negatively selected in their unobservable characteristics in all countries except Ecuador for which no evidence of selection was found. Gubert et al (2010) applied similar method in Mali where 20% of the sample received international remittance. They found that migrant households are negatively selected and international remittances led to a fall in the fraction of poor people from .49 to .46. Inequality also decreased.

Adams (2006) studied the impact of remittances on poverty and inequality in Guatemala using counterfactual estimation method. Consumption function was estimated for non-remittance receiving households using OLS method as there was no evidence of self selection. This was used to predict the counterfactual consumption in the hypothetical case of no-remittance for those who receive and do not receive remittance. To get consumption in the actual case, remittance was added to the predicted counterfactual consumption. The effect of international remittances on poverty depends on the type of measure considered and is generally small. The

head count ratio rose from .55 to .56 while the poverty gap and squared poverty gap ratios respectively fell from .24 to .23 and from .14 to .15. Inequality did not change.

IV. Empirical Strategy

To study the effects of remittances on poverty and inequality, a counterfactual consumption function is first estimated in the hypothetical case of no migration and no remittance. Then, the poverty and inequality measures in the counterfactual and actual cases are compared. This approach takes into account the fact that remittances are in part replacements for income lost by households as a result of sending some of their members abroad and hence are not exogenous additions to households' income. It also allows for capturing indirect effects of migration and remittances on households' welfare. For example, remittances may relax the credit constraints of the recipient households while the presence of a migrant member abroad could serve as a source of insurance. The choice of consumption over income as a measure of welfare is motivated by the fact that information on consumption is more reliable than information on income in a developing country context. Consumption is also less volatile than income and hence measures average welfare of households better than income (Deaton, 1997).

To construct the counterfactual consumption for remittance receiving households, the following function is estimated for the sub sample of households who do not receive remittance:

$$\log C_i = \alpha_1 + \beta_1 X_i + \gamma_1 H_i + U_{1i} \tag{1}$$

Where C_i is consumption per capita, X_i is a vector of household level variables including inter alia demographic, human capital and location variables; H_i is a vector of household head characteristics and U_{1i} is a disturbance term.

If the households that receive remittance are randomly drawn from the whole population, the consumption function can be estimated using OLS method. But there is evidence in the migration literature that this may not necessarily be the case. If remittance receiving households are selected in their unobservable characteristics, OLS will not give consistent estimates and hence the result will be misleading. If they are positively selected, the result based on OLS estimation will overstate the effect of remittances on consumption. On the other hand, if they are negatively selected, the effect will be underestimated. Given that migration usually requires huge

initial cost (investment), it could be argued that migrant households are likely to be positively selected. But negative selection is also possible as less productive and poorer households consider migration as a means to boost their income and get out of poverty. The type of selection, therefore, depends on the specific context.

Thus, in order to get consistent estimates, the Heckman (1979) two-stage selection method is applied.[4] In the first stage, the probability of not having a migrant member abroad and hence not receiving remittance is estimated using Probit method.[5] The information from the Probit regression is used in the second stage consumption estimation. The selection equation can be given as:

$$M_i^* = \alpha_2 + \beta_2 X_i + \gamma_2 H_i + \eta Z_i + U_{2i} \tag{2}$$

Where M_i^* measures the propensity to be in the non-remittance receiving group, Z_i represents variables that affect non-remittance probability but not the consumption function, and U_{2i} is a disturbance term. X_i and H_i are defined the same way as in equation (1). M_i^* is not observed; only its sign is observed. Define an indicator variable, M_i which shows whether a household is in the non-remittance receiving group or not as:

$$M_i = \begin{cases} 1 \text{ if } M_i^* > 0 \\ 0 \text{ if } M_i^* \leq 0 \end{cases}$$

Y_i is observed only for those households who do not get remittance or for whom $M_i = 1$. The error terms in equation (1) and (2) are assumed to have a joint normal distribution given by:

$$\begin{bmatrix} U_{1i} \\ U_{2i} \end{bmatrix} \sim N \left[\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} \sigma_1^2 & \sigma_{12} \\ \sigma_{12} & 1 \end{bmatrix} \right]$$

where the normalization $\sigma_2^2 = 1$ is used because only the sign of M_i^* is observed and hence σ_2^2 is unknown. Under the above normality assumption about the error terms and using equations (1) and (2), we will have:

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[4] For a discussion on selection models refer Cameron and Trivedi (2005)
[5] It is assumed that all households who have some relative(s) abroad receive remittance. I.e., there are no migrants who don't send back remittance to their relatives back home.

$$E\left(\log C_i / X_i, H_i, M = 1\right) = E\left(\alpha_1 + \beta_1 X_i + \gamma_1 H_i + U_{1i} / \alpha_2 + \beta_2 X_i + \gamma_2 H_i + \eta Z_i + U_{2i} > 0\right)$$
$$= E\left(\alpha_1 + \beta_1 X_i + \gamma_1 H_i + U_{1i} / U_{2i} > -\alpha_2 - \beta_2 X_i - \gamma_2 H_i - \eta Z_i\right)$$
$$= \alpha_1 + \beta_1 X_i + \gamma_1 H_i + E\left(U_{1i} / U_{2i} > -\alpha_2 - \beta_2 X_i - \gamma_2 H_i - \eta Z_i\right)$$
$$= \alpha_1 + \beta_1 X_i + \gamma_1 H_i + \sigma_{12}\lambda_i\left(\alpha_2 + \beta_2 X_i + \gamma_2 H_i + \eta Z\right)$$
$$(3)$$

where λ_i is the selection inverse Mill's ratio given by:

$$\lambda_i = \frac{\phi\left(\alpha_2 + \beta_2 X_i + \gamma_2 H_i + \eta Z_i\right)}{\Phi\left(\alpha_2 + \beta_2 X_i + \gamma_2 H_i + \eta Z_i\right)}$$

ϕ and Φ are respectively the density and the cumulative normal functions. If σ_{12} is zero, the error terms in the selection and consumption equations are not correlated and OLS regression will give consistent estimates. But if $\sigma_{12} \neq 0$, OLS will not give consistent estimates and hence should not be used. In order to include the selection term in the consumption regression λ_i is estimated from the first step Probit regression of no remittance probability and included in the second stage consumption equation. Thus, the function to be estimated in the second stage is:

$$\log C_i = \alpha_1 + \beta_1 X_i + \gamma_1 H_i + \sigma_{12}\hat{\lambda}_i + V_i, \text{ where } E\left(V_i / X_i, H_i, \hat{\lambda}_i\right) = 0 \qquad (4)$$

OLS can then be used to estimate equation (4) and the presence of selection can be checked by testing the hypothesis that σ_{12} is zero. If σ_{12} is statistically different from zero, there is selection. While similar variables could be included in both regression equations, identification requires that there should at least be one variable included in the selection equation but not in the consumption equation. This is known as the exclusion restriction. This is not an easy task given the close inter-linkage between the two dependent variables, i.e., a variable that affects the probability of not receiving remittance will very likely affect consumption as well. Instruments that have been used so far include age of household head (Adams, 2006), wealth and regional fraction of remittance recipients (Acosta et al, 2008); and district level concentration of major ethnic groups (Gubert et al, 2010).

In this paper, religion is used as a source of identification. More specifically, a dummy variable for Muslim households is included in the migration equation. It is widely accepted that social networks are important determinants of international migration and religion is one way of forming social networks. Muslim households are expected to have better network with the

Middle East which is a predominantly Muslim region and is the most important destination for Ethiopian migrants. Therefore, it will be easier for Muslim households to acquire information about migration possibilities. Muslim migrants will also assimilate and settle easily due to the similarity in religion. Thus, Muslim households will have larger chance of sending a migrant member abroad and receiving remittance.

It is assumed that religion does not affect consumption directly. Both Islam and Christianity coexisted for a long period of time in Ethiopia and there is no clear cultural and lifestyle differences between the followers of the two religions especially in big cities where the data for this study is collected. Thus, it is very unlikely that religion will have any direct effect on consumption after controlling for demographic, human capital, ethnicity, and location variables.

Once the consumption function is estimated for the non-remittance recipients, it is used to predict consumption for remittance recipients in the counterfactual case of no-remittance. Then, poverty and inequality measures in the counterfactual and actual cases can be compared. But there are some issues that have to be addressed before that. First, household variables for remittance recipients should be revised so as to include the migrants in the calculation of the counterfactual consumption and in the first stage Probit regression. In the absence of detailed information about the migrants, some assumptions are in order. From the survey, only the number of remitters and their relationship with the household head are known. I assume that those migrants who are close relatives to the household head (i.e., children and spouses) would be part of the household if they did not migrate and hence are included in the household.[6] It is also assumed that the migrant is an adult and has finished high school education.

Another issue that has to be addressed is the fact that the predicted counterfactual consumption distribution has an artificially lower variance since it is based on an estimated regression equation which does not include variation in the error term. To address this issue, I used a method followed by Barham and Boucher (1998) and Acosta et al (2008) which adds an error component to the predicted counterfactual consumption values for the remittance receiving households. An error term with the same mean and standard deviation as the one predicted from

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[6] It is possible that some of the remitters were not part of the household before they migrate even if they are close relatives of the household head. On the other hand, some of the remitters who are not close relatives of the household head might have been part of the household before they migrated. Thus, as an alternative, similar estimation was done assuming every remittance receiving household has one migrant member abroad – an approach used by other researchers (Acosta et al, 2008 and Gubert et al, 2010) in the absence of any information about the migrant. The result does not change.

the second stage consumption regression is drawn and added to the estimation of counterfactual consumption for remittance recipients. To avoid the possibility that the result depends on a single draw, 1000 draws are made, every time calculating poverty and inequality measures. The average poverty and inequality values are then compared with the actual values.

As an alternative, a method similar to what Rodriguez (1998) and Adams (1989)[7] followed is applied in which predicted consumption values are used for the actual scenario instead of adding an error component to the predicted counterfactual consumption. This makes the two consumption distributions comparable. To construct consumption for the actual case, OLS regression is estimated on the whole sample. Two remittance related dummies are included in addition to the right hand side variables in equation (4). The first one is for all remittance receiving households and the second is only for those who receive from distant relatives. This helps to see if remittances received from close and distant relatives have different effects on consumption. It is expected that remittances received from distant relatives are smaller than remittances received from close relatives and hence have lower effect on per capita consumption.

V.   Data and Summary Statistics

Data Source

The data for this study comes from the 2004 round of the Ethiopian Urban Socio-economic Survey (EUSS) collected by Addis Ababa University in collaboration with Gothenburg University. The sample includes more than 1400 households drawn from Addis Ababa, the capital city, and six other big cities from different parts of the country, namely, Awassa, Bahir Dar, Dessie, Dire-Dawa, Jimma, and Mekelle. The sample was distributed to the seven cities proportional to their population size. Accordingly, about 60% of the households are from Addis Ababa which had a population of more than three Million people in 2004 while the rest are distributed to the other cities roughly equally because they had more or less equal population size. The data includes detailed information about consumption and household characteristics among other things. Consumption is used as a measure of welfare and to account for regional price variations, the price deflator constructed by Gebremedhin and Whelen (2008) for each city (relative to Addis Ababa) is used.

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[7] But they did not control for selection unlike the present paper.

Even though the survey was not conducted for remittance related studies, it includes important questions about remittances. Households were asked whether they received remittance or not, and if they did, how much they received. Some questions were also asked about the remitters including their relationship with the household, i.e., whether they are close family members (spouses and children of the household heads) or distant relatives. But important information about the remitters, including location, age, education, and gender are missing. Thus, it should be clear from the outset that the analysis is constrained by the nature of the data, namely, its incomprehensiveness for the purpose of my research.

Remittances: Descriptive Analysis

Out of the total 1410 households, 198 (14%) received remittance from abroad, of which 122 (62%) received from close family members while the rest 76 (38%) received from distant relatives. Most of them received from one remitter. 72% of the remittance recipients are from Addis Ababa where 60% of the total 1410 households come from. The remitters have on average lived abroad for 6 years and 55% of them have never been married. Table 1 reports a summary of the amount of remittance received.

Table 1. Remittance Received in 2004 in Birr

	receive from close family members	receive from distant relatives	all recipients	all households
Average household level remittance	4325	2939	3793	533
Average remittance per capita	716	549	657	95
Remittance as a % of total consumption	31	27	30	6
Number of households (% of total sample in parentheses)	122 (8.65)	76 (5.39)	198 (14.04)	1410 (100)

Note: 1 USD ≈ 8.5 Birr in 2004

On average, the recipient households received about 3800 Birr each while the average per capita remittance received was more than 600 Birr. The average amount received is large compared with the national GDP per capita of 1200 Birr in the same year. Those who received from close family members get more remittance on average compared with those who receive from distant relatives. While it is not surprising that the second group received less, it is

noteworthy that they account nearly for 40% of the total recipient households. This shows that the benefit of migration is not restricted to the core families of the migrants and that is consistent with the importance of the extended family in Ethiopia.

The average remittance over the whole sample is more than 500 Birr while the per capita remittance is 95 Birr (about 11 US dollar). The per capita remittance at national level was only 2 USD in the same year (World Bank, 2011). The discrepancy could be because the survey used in this paper includes only urban households which are more likely to have migrant members abroad and hence receive remittance compared with households in the rural areas. But it may also be reflecting (at least partly) the fact that official remittance figures are underestimated as they do not include remittances received through informal channels. Remittance is also big when measured as a fraction of consumption expenditure. For remittance recipients, it accounts for 30% of total consumption expenditure while it covers 6% of all households' consumption expenditure.

Table 2: Frequency of receipt and main purpose of remittance money

	Percentage
When does the household get remittance?	
Regularly	41
During holydays	42
During social-occasions	10
During difficult times (eg. draught)	5
Unspecified times	2
Main purpose remittance money is used for	
Consumption	84
Investment (& saving)	3
Ceremonies	3
Children's education	7
Unspecified purposes	3

Remittance receiving households were also asked how frequently they received remittance and what they use the remittance money mainly for. Their response is summarized in table 2.

41% of them receive remittance regularly while 42% receive during holidays.[8] The vast majority of them said that the remittance money was primarily used for consumption. This is consistent with the common view that remittances are mainly used for consumption and hence have little effect on productive investment. But the fact that most households use remittance primarily for consumption does not necessarily mean it has no relevance on other expenditures. Some money could be freed from consumption and made available for other purposes.

Variables: Description and Summary Statistics

In this section the description and summary statistics of the variables used in the estimation of the consumption and selection equations are presented. The variables can be divided in to five groups, namely, household level demographic and human capital variables, household head characteristics, ethnicity, location, and religion. The last one is included only in the selection equation.

Household level human capital and demographic variables are important determinants of household production and hence consumption per capita. While the numbers of adults and educated members in the household are expected to have positive effect on consumption per capita, household size is likely to have a negative effect. Given the unique role played by household heads, their characteristics are important determinants of household welfare. Gender, marital status, age, and education of the household head are included. Location and ethnic variables are also included. While location reflects the variation in economic activities and cost of living across regions, the ethnicity variables will capture any difference among ethnic groups that may affect household welfare.

Human capital and demographic variables are also important for the selection equation. It is expected that households with more adults and educated members have higher probability of sending members abroad and lower probability of being in the no remittance group. Household head characteristics are also important. Ethnicity may also affect migration. It is common to form social networks along ethnic lines. If migration history differs across ethnic groups, it will be easier for households from ethnic groups with longer migration history to send a member abroad

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[8] Ethiopians emigrants have a norm of sending money to their families during major holidays though the money is not necessarily spent only for holiday festivities. Thus, it could be argued that a large fraction of the recipients receive remittance regularly.

and hence have lower probability of not receiving remittance. Location which is associated with economic opportunities and cost of migration is very important.

Finally, a dummy variable for Muslim households is included as a source of identification for the probability of not receiving remittance. It is likely that Muslim households have better network with the Middle East which is a predominantly Muslim region and is an important destination for Ethiopian emigrants. The psychological cost of migrating to the Middle East is also expected to be lower for Muslim individuals than for others. Consequently, Muslim households are more likely to have migrant members abroad and hence less likely to be in the non-remittance receiving group. Religion is believed to have no direct effect on consumption and is not included in the consumption equation. Summary statistics for all the variables is provided in table 3. The definitions of the variables are given in table 8 in the appendix.

Table 3. Summary Statistics of Explanatory Variables

Variables	receive from close relatives	receive from distant relatives	all recipients	non-recipients	all households
Demographic and Human Capital Variables					
Number of adults					
Actual	4.75(2.25)	4.03(1.88)	4.47(2.14)	4.21(2.1)	4.24 (2.11)
Counterfactual	5.8(2.24)	4.03(1.88	5.12(2.27)	-	4.33(2.15)
Household size					
Actual	6.04(2.74)	5.36(2.23)	5.78(2.57)	5.57(2.6)	5.6(2.6)
Counterfactual	7.09(2.74)	5.36(2.23)	6.42(2.69)	-	5.69(2.63)
Members with secondary education					
Actual	1.95(1.75)	2.05(1.68)	1.99(1.72)	1.51(1.66)	1.59(1.67)
Counterfactual	3(1.74)	2.05(1.68)	2.64(1.78)	-	1.67(1.72)
Members with primary Education	2.67(2.15)	2.41(1.93)	2.57(2.07)	2.89(2.08)	2.86(2.07)
Household Head Characteristics					
Female head	.52	.45	.49	.44	.45
Single head	.58	.55	.57	.45	.47
Age of head	57.42(13.4)	45.79(13.03)	52.91(14.39)	50.24(13.83)	50.6(13.93)
Head has primary education	.32	.29	.31	.33	.33
Head has secondary education	.22	.43	.30	.24	.25

Note: standard deviations are given in parentheses for continuous variables

Table 3. Summary Statistics of Explanatory Variables (cont'd)

Variables	receive from close relatives	receive from distant relatives	all recipients	non-recipients	all households
Ethnicity					
Amhara	.49	.53	.50	.51	.50
Oromo	.18	.18	.18	.18	.18
Gurage	.12	.11	.11	.12	.12
Tigre	.16	.13	.15	.11	.11
Others	.06	.05	.06	.08	.08
Location					
Addis Ababa	.72	.72	.72	.57	.60
Awassa	.07	.08	.07	.07	.07
Bahir Dar	.05	.03	.04	.07	.07
Dessie	.04	.07	.05	.07	.07
Dire Dawa	.02	.05	.03	.07	.06
Jimma	.02	.04	.03	.07	.07
Mekelle	.08	.01	.06	.07	.07
Muslim	.17	.12	.15	.12	.12
Sample size	122	76	198	1212	1410

Note: standard deviations are given in parentheses for continuous variables

For the first three variables in the demographic and human capital category, counterfactual values are provided for recipient households along with the actual values. In the counterfactual case, remitters who are close family members are included as part of the household. Migrant members are assumed to be adults (older than 14 years) with high school education. The counterfactuals are used in the first stage selection regression and in calculating counterfactual consumptions.

Noticeable differences are observed for some of the variables between remittance receiving and non- receiving households. Recipient households are larger on average. They also have more adults and high school graduates. This is true even for the actual values which do not take into account migrant members though the difference is smaller. This suggests that households with more human capital are likely to send migrants abroad consistent with the human capital theory of migration. The percentages of households with female, single, and high school graduate heads are larger for the recipients. The recipients also have older household heads on average.

Proportionally, a higher number of households from Addis Ababa receive remittance compared with the other cities. The fact that Addis Ababa has higher proportion of remittance recipients than the other cities is to be expected as it is relatively easier for households living in Addis Ababa to send members abroad compared with households in the regional cities. The fraction of Muslim households is bigger for the recipient group. Differences are also observed in some of the variables between the two remittance receiving groups. For example, those who receive remittance from close family members have on average more adult members and larger household size than those who receive from distance relatives.

VI.   Regression Results

In this section the results of the two step Heckman selection regression are presented. In the first stage selection equation, all households are included where human capital and demographic variables are adjusted so that they include the migrants. But in the second stage consumption regression, only information from non-remittance recipients is used. The estimated consumption equation is used to predict counterfactual consumption for the recipient households. The result is reported in table 5. For the selection equation, marginal effects are reported in addition to the slope coefficients. When a marginal effect for a particular variable is computed, the other

variables are set at their mean values. For a continuous variable, the marginal effect is due to a small change while for a dummy variable it is due to a change from zero to one.

Table 4. Estimates of Selection Controlled Counterfactual Consumption

Explanatory variables	Log Consumption per capita	Pr(No remittance)	
		Slope	Marginal Effects
Number of adults	.019(.025)	-.009(.049)	-.002
Household size	-.180(.028)***	-.101(.048)**	-.020
Members with primary educ	.059(.027)**	.095(.048)**	.019
Members with secondary educ	.070(.030)**	-.098(.050) **	-.019
Female head	-.152(.069)**	-.036(.129)	-.007
Single head	.015(.083)	-.365(.127)***	-.073
Age of head	.019(.011)*	.026(.018)	.005
Age of head squared/100	-.015(.010)	-.029(.017)*	-.006
Head has primary education	.234(.071)***	-.166(.131)	-.034
Head has secondary education	.496(.084)***	-.149(.152)	-.031
Awassa	.207(.099)**	-.094(.184)	-.019
Bahir Dar	.369(.104)***	.371(.213)*	.060
Dessie	-.155(.098)	.259(.202)	.045
Dire Dawa	-.097(.104)	.400(.224)*	.064
Jimma	.060(.104)	.486(.227)**	.074
Mekelle	.268(.152)*	.339(.252)	.056
Amhara	-.013(.099)	-.319(.207)	-.063
Oromo	-.100(.111)	-.048(.229)	-.010
Gurage	-.016(.105)	-.275(.216)	-.060
Tigre	-.189(.157)	-.643(.257)**	-.165
Muslim		-.468(.145)***	-.112
Constant	4.444(.286)***	1.703(.528)***	
Lambda	.836(.376)**		
Predicted Probability			.882

Note: Standard errors of the coefficients are given in parentheses. *, **, and *** represent significance level at 10%, 5% and 1% respectively.

Selection Equation

Household size has a significant negative effect on the probability of being in the no-remittance group. An additional household member decreases the likelihood of not receiving remittance by 2%. The effect is small relative to the predicted probability of not receiving remittance which is

88%.[10] An additional household member with primary education increases the odds of not receiving remittance by 2% while an additional member with high school education has the opposite effect with the same order of magnitude. In other words, the probability of receiving remittance is positively affected by household size and the number of high school graduates and negatively affected by the number of household members who have completed primary education.[11]

From the household head characteristics, having single household head is associated with 7% lower probability of not receiving remittance. Gender and education of the household do not have significant effects. Age of the household head does not have a significant effect. The squared age of the head has a negative effect but it is significant only at ten percent and the magnitude is also very small.

From the city dummies; Bahir Dar, Dire Dawa, and Jimma have significant effects on the probability of not receiving remittance. Households from Bahir Dar and Dire Dawa are 6% more likely to be in the non-receiving group relative to their counterparts from Addis Ababa. Similarly, coming from Jimma is associated with 7% larger probability of not receiving remittance. Only one of the ethnicity dummies has a significant effect and shows that *Tigres* are 17% less likely to be in the selection group of no-remittance compared with the reference group which includes ethnicities other than the four major ethnic groups. Finally, Muslim households have 11% lower probability of not receiving remittance. The effect is considerable in magnitude and statistically highly significant. This shows that religion is important in determining households' selection into the non-remittance receiving group. Religion is not included in the second stage consumption equation and hence identifies the selection equation.

Consumption Equation

Turning to the consumption equation, the first thing to observe is that the inverse Mill's ratio has a significant and positive coefficient showing that the errors of the two equations are positively correlated. This implies that non-remittance receiving households are positively selected in their unobservable characteristics. To put it differently, there is negative selection into migration and

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[10] But relative to the predicted probability of receiving remittance which is 12%, it is big.
[11] It could be argued that remittance might affect some of the household level demographic and human capital variables. But given that most of the remitters stayed abroad only for few years, the average being 6 years, it is believed that there will not be big endogeneity bias.

remittance. Though this is against the common belief that migrant households are positively selected, it is consistent with the finding by Acosta et al (2008) in Latin America and Gubert et al (2010) in Mali. Thus, counterfactual estimation which does not take selection into account will underestimate the effect of remittances on consumption.

From the human capital variables, household size has significant negative effect on consumption per capita confirming the usual negative relationship between household size and welfare. An additional household member leads to a 2% fall in consumption per capita. One more household member with primary education leads to 6% more consumption per capita. Similarly, an additional household member with high school education is associated with 7% higher consumption per capita. This shows that education improves household welfare.

From the household head characteristics; gender, age, and education are important. Female headed households have 15% lower consumption per capita. Age of the household head has a positive effect. An additional year is associated with 2% higher consumption per capita. The coefficient of the squared age of the head is not significant. Households with heads who have completed primary education have 23% higher consumption per capita relative to those with heads who have not completed primary education. Having a high school graduate head is associated with 50% higher consumption per capita. These results indicate that education of the household head improves household welfare like education of other household members. More specifically, education of the household head has larger effect than that of the other household members reflecting the important role played by the household head in the family. From the city dummies, Awassa, Bahir Dar and Mekelle are respectively associated with 21%, 37% and 27% higher consumption per capita relative to Addis Ababa.

The consumption estimates presented in table 4 are used to construct counterfactual consumption values for remittance receiving households in the hypothetical case of no remittance. Like in the estimation of the selection equation, household level human capital variables are adjusted to include the migrants. As was discussed in section three, an error component is added to the predicted counterfactual values to account for the artificially reduced variability of the counterfactual consumption values.[12] Counterfactual consumption estimates for

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[12] As an alternative, OLS regression is run on the whole sample and the result is used to predict consumption in the actual case. I.e., both the actual and counterfactual consumption distributions will be based on predicted values and hence will be comparable. Most of the variables that were significant in the selection controlled consumption regression are significant with similar sign. The result shows that households who receive remittance from close

the remittance receiving households combined with the actual consumption values for the non-recipients gives the consumption distribution in case of no remittance.

VII. Effects on Poverty and Inequality

In this section the effects of remittances on poverty and inequality are presented. The three variants of the FGT index (Foster et al, 1984), i.e., the head count, the poverty gap and the squared poverty gap ratios are reported. I used the poverty line set by Gebremedhin and Whelan (2008) using a similar survey from 2000. Following the cost of basic needs approach, they first constructed the food poverty line by estimating the value of a basket of food items that meets the minimum calorie requirement for a healthy life which is 2200 Kcal per adult per day. Then, the food poverty line was scaled up to include the non-food component taking into account the share of food consumption expenditure. Accordingly, the total poverty line per adult per month was 91 Birr in 2000 which becomes 100.24 Birr after adjusting for inflation between 2000 and 2004. For the inequality analysis the Gini index is used. As complementary measures of inequality, the total consumption shares of the top and bottom 20% of households after being ranked by consumption per capita are also reported.[13] The Gini and the three poverty indices are calculated using household consumption per capita adjusted by equivalence scale.[14] Household sizes are used as weights. The equivalence scale used takes into account the fact that children cost less than adults and there is economies of scale in consumption. It is given as follows:

$$ES = (A + \alpha K)^{\theta}, 0 < \alpha < 1, 0 < \theta < 1 \tag{5}$$

Where A is number of adults, K is number of children, α is cost of children relative to adults and θ is a measure of economies of scale. It is believed that α is low and θ high in poor countries, i.e., while children cost lower relative to adults there is no big economies of scale in poor countries (Deaton and Zaidi, 2002). Following Kedir and Disney (2004) α and θ are set to be 0.5 and 0.95 respectively.

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and distant relatives respectively have on average 44% and 20% higher consumption per capita than those who do not receive remittance. This is consistent with the fact that the average remittance received is larger for the first group. The whole regression result is reported in table 9 in the appendix.

[13] Households are first ranked according to their per capita consumption using household sizes as weights, and then the total consumption shares are calculated.

[14] The Gini and poverty indices were also computed using consumption per capita without adjusting by equivalence scale and the result does not change though poverty increases in general as expected

Before going to the effects of remittances on poverty and inequality, it is imperative to have a look at the average consumption per capita of the different sub groups based on remittance status. Table 5 reports the summary statistics of consumption per capita in the actual and counterfactual scenarios for the different sub samples and the whole sample.

Table 5. Actual and counterfactual monthly consumption per capita by remittance status (in Birr)

	Remittance Recipients			Non Recipients	All Households
	Receive from close relatives	Receive from distant relatives	All remittance recipients		
Counterfactual	154	168	159		154
	(155)	(162)	(157)		(172)
Actual	221	190	209	153	161
	(185)	(146)	(171)	(174)	(175)

Note: Standard Deviations are given in parenthesis

As can be seen from table 5, the average consumption per capita is slightly higher for remittance recipients than for non-recipients in the counterfactual case. This implies that the recipients are on average better-off than the non-recipients even without remittances. This contradicts the negative selection into migration and remittance which is presented in the last section. The fact that their average consumption per capita is higher implies they are positively selected in their observable characteristics. Normally, selections in observable and unobservable characteristics are expected to go in the same direction, but that does not have to be necessarily the case.[15]

In the actual case, which includes the effect of remittances, average consumption per capita for the recipient households increased significantly making them clearly better-off than the non-recipients. It is noteworthy that the increase in consumption per capita is comparable with the average remittance per capita received.[16] It is also consistent with the result reported in table 2 which shows that 84% of the recipients use remittance money primarily for consumption. From the two recipient groups, counterfactual consumption per capita is larger for those who receive from distant relatives. But the actual consumption per capita is bigger for those receiving from

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[15] for a detailed discussion on types of migrants' selection refer Borjas (1989)
[16] Average consumption per capita increased by 50 Birr while the average monthly remittance per capita is about 57 as reported in table 1 in section four.

close relatives which is also consistent with the relative size of the average remittance received by the two groups.
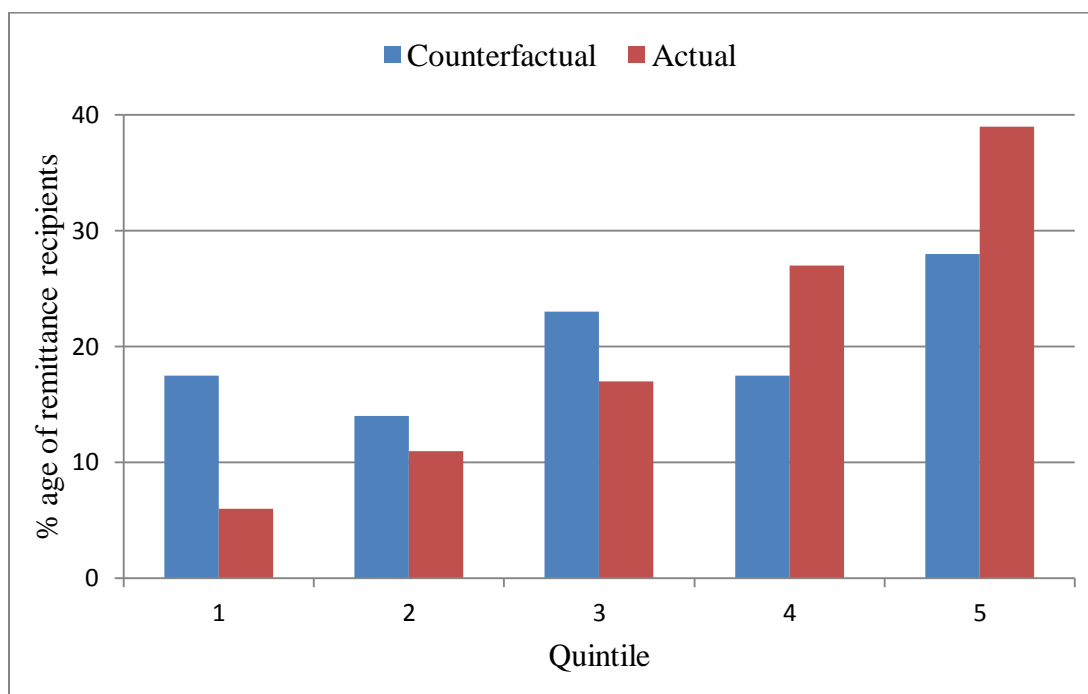

Figure 3. Distribution of Remittance Recipients by Quintile of Consumption per capita

Figure 3 shows how the remittance recipient households are distributed across quintiles of consumption per capita both in the actual and counterfactual cases. In the counterfactual case which does not include the effect of remittances, the recipients are fairly distributed across all consumption quintiles though they are overrepresented in the third and fifth quintiles. This indicates that the recipients do not particularly come from the bottom or top consumption group. In the actual case, however, the percentage of the recipients increases as one goes up the quintiles thanks to remittances; nearly 40% of them are located in the top quintile while only 6% come from the bottom quintile.

In what follows, I present the main results of the paper, i.e., the effects of remittances on poverty and inequality. The effects on the remittance receiving sub sample and on the whole sample are reported in tables 6 and 7 respectively. They are based on the error corrected predicted counterfactual values. The results based on the alternative method which uses

predicted values both for the actual and counterfactual cases are reported in tables 10 and 11 in the appendix and are in general similar to those reported in tables 6 and 7.

Table 6. Effects on Poverty and Inequality on Remittance Recipients

		Head Count Ratio	Poverty Gap Ratio	Squared Poverty Gap Ratio	Gini Coefficient
Receive from close relatives	Counterfactual	.393	.147	.075	.407
	Actual	.206	.060	.026	.394
	Difference	↓.187(48%)	↓.087(59%)	↓.049(66%)	↓.013(3.2%)
Receive from distant relatives	Counterfactual	.313	.108	.052	.414
	Actual	.179	.054	.027	.37
	Difference	↓.134(43%)	↓.054(50%)	↓.025(48%)	↓.044(11%)
All remittance recipients	Counterfactual	.366	.134	.067	.415
	Actual	.196	.058	.026	.387
	Difference	↓.170(46%)	↓.076(57%)	↓.041(61%)	↓.028(6%)
Non recipients	Actual	.413	.137	.063	.418

Table 6 shows that poverty in the absence of remittance is high for both remittance receiving and non-receiving groups. The head count ratio is moderately lower for the recipient group compared with the non-recipients, while the poverty gap and the squared poverty gap ratios are more or less the same for the two groups. But remittance remarkably decreased poverty for the recipient group. The head count, poverty gap, and squared poverty gap ratios respectively fell by 17%, 8%, and 4%. The relative rate of poverty reduction (proportional to the original poverty level) is the highest for the squared poverty gap ratio followed by the poverty gap ratio.

Differences are also observed between the two groups of remittance recipients. In the no-remittance case, the poverty measures are larger for those who receive from close relatives consistent with their lower average counterfactual consumption per capita reported in table 5. With remittances, the head count and the poverty gap ratios are bigger for those receiving from close relatives while the squared poverty gap is slightly bigger for those who receive from distant relatives.

In the no-remittance case, inequality is the same for the recipient and non-recipient groups. But in the actual case inequality is lower for the recipient group thanks to the inequality reducing effect of remittances. The Gini coefficient for the recipient group fell from 42% to 39%. The fact that inequality among the receiving group is reduced is a positive result in terms of the welfare effect of remittances.

Table 7. Effects on Poverty and Inequality on the Whole Sample

	Head Count Ratio	Poverty Gap Ratio	Squared Poverty Gap Ratio	Gini Coefficient	Share of top 20%	Share of bottom 20%	Share of top 20% / Share of bottom 20%
Counter factual	.407	.137	.063	.419	.485	.577	8.40
Actual	.382	.126	.057	.419	.481	.577	8.33
Difference	↓.025 (6%)	↓.011 (8%)	↓.006 (10%)	.000	↓.001 (2%)	.000	↓.007 (1%)

Finally, the effects of remittances on overall poverty and inequality are reported in Table 7. All poverty measures in the actual case are lower compared with the ones in the no-remittance case. I.e., remittances decreased overall poverty and this is caused by the substantial fall in poverty in the remittance receiving group. The head count, the poverty gap, and the squared poverty gap ratios dropped by 2.5%, 1.1% and 0.6% respectively. The magnitude is not very big because the remittance receiving households do not mainly come from the bottom consumption distribution.

There is no effect on inequality.[17] Given that remittance recipients are on average slightly better-off than the non-recipients in the absence of remittance and the amount they received is large, inequality would be expected to increase. But thanks to the equalizing effect of remittances within the receiving group, there is no effect on overall inequality suggesting that the two opposing effects cancel out. The consumption shares of the top 20% and the bottom 20% do not

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[17] In the alternative method, inequality increased slightly as is shown in table 11 in the appendix. The way consumption is estimated in the actual case (where dummies for remittance recipients are included) suppresses the potential inequality reducing effect of remittance within the receiving group. This led to a small rise in overall inequality.

also change much. Given the general trend that remittances aggravate inequality especially in areas where the migration rate is not very high, the result is noteworthy.

VIII. Conclusion

I have studied the impacts of remittances on poverty and inequality in Ethiopia using an urban household survey. Counterfactual consumption is estimated in the hypothetical case of no remittance using information on the non-remittance recipients in a selection corrected estimation framework which incorporates migration decisions by households. To account for the fact that the counterfactual consumption distribution has an artificially reduced variance which might affect the analysis, an error component is added to the predicted counterfactual consumption values. Poverty and inequality measures in the counterfactual case are then compared with the actual values.

Remittance recipients have slightly higher average consumption per capita than the non-recipients in the no-remittance scenario indicating that they are on average better-off than the non-recipients even without remittances. Remittances led to a huge increase in the consumption of the recipient households which widens the gap between the recipient and the non-recipient groups much further.

Poverty substantially decreased for the recipient group which also led to a modest fall in overall poverty. The head count, poverty gap, and squared poverty gap ratios for the whole sample dropped by 2.5%, 1.1%, and 0.6% respectively. This is consistent with what Acosta et al (2008) found in their study on ten Latin American and Caribbean countries and Gubert et al (2010) on Mali. Taking into account the fairly small migration rate, the reduction in poverty is considerable. Remittances led to a slight fall in inequality within the receiving group. But there is no effect on overall inequality similar to what Adams (2006) found on Guatemala.

The result from this paper adds to the few available studies that found significant poverty reducing effect of remittances. The fact that no change is observed in inequality also confirms the general unclear effect of remittances on inequality documented across studies. Given the current moderate rate of migration, further migration is expected to reduce both poverty and inequality.

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Appendix

Table 8. Definitions of Variables

Variables	Definition
Demographic and Human Capital Variables	
Number of adults	Number of adult in the households
Household size	Household size
Members with secondary education	Number of household members who have completed high school
Members with primary education	Number of household members who have completed primary education
Household Head Characteristics	
Female head	Dummy for female household heads
Single head	Dummy for single household heads
Age of head	Age of household head in years
Age of head squared	Age of household head squared
Head has primary education	Dummy for household heads who have completed primary education
Head has secondary education	Dummy for household heads who have completed high school education
Ethnicity (control group: other ethnic groups)	
Amhara	Dummy for Amhara households
Oromo	Dummy for Oromo households
Gurage	Dummy for Gurage houseolds
Tigre	Dummy for Tigre households
Location (control group: Addis Ababa)	
Awassa	Dummy for households from Awassa
Bahir Dar	Dummy for households from Bahir Dar
Dessie	Dummy for households from Dessie
Dire Dawa	Dummy for households from Dire Dawa
Jimma	Dummy for households from Jimma
Mekelle	Dummy for households from Mekelle
Muslim	Dummy for Muslim households

Table 9. OLS estimates of actual consumption (log consumption per capita)

Explanatory variables	Slope coefficients (standard errors in parentheses)
Number of adults	.031(.019)
Household size	-.158(.019)***
Members with primary education	.032(.019)*
Members with secondary education	.091(.021) ***
Female head	-.139(.052)***
Single head	.093(.052)*
Age of head	.006(.008)
Age of head squared/100	-.191(.727)
Head has primary education	.226(.052)***
Head has secondary education	.494(.063)***
Awassa	.259(.075)***
Bahir Dar	.259(.076)***
Dessie	-.192(.075)***
Dire Dawa	-.157(.077)**
Jimma	-.017(.075)
Mekelle	.134(.108)
Amhara	.029(.074)
Oromo	-.094(.085)
Gurage	.027(.079)
Tigre	-.016(.105)
Remittance	.441(.065)***
Remittance from distance relatives	-.242(.098)**
Constant	4.77(.212)***
Adjusted R-squared	.28

Note: *, **, and *** represent significance level at 10%, 5% and 1% respectively

Table 10. Effects on Poverty and Inequality on Remittance Recipients (alternative method)

		Head Count Ratio	Poverty Gap Ratio	Squared Poverty Gap Ratio	Gini Coefficient
Receive from close relatives	Counterfactual	.320	.063	.020	.230
	Actual	.042	.005	.001	.220
	Difference	↓.278(87%)	↓.058(92%)	↓.019(96%)	↓.010(4%)
Receive from distant relatives	Counterfactual	.152	.029	.008	.226
	Actual	.086	.010	.001	.219
	Difference	↓.066(44%)	↓.019(65%)	↓.007(82%)	↓.007(3%)
All remittance recipients	Counterfactual	.266	.052	.016	.231
	Actual	.058	.007	.001	.222
	Difference	↓.208(78%)	↓.046(87%)	↓.015(93%)	↓.009(4%)
Non recipients	Actual	.286	.062	.021	.223

Table 11. Effects on Poverty and Inequality on the Whole Sample (alternative method)

	Head Count Ratio	Poverty Gap Ratio	Squared Poverty Gap Ratio	Gini Coefficient	Share of top 20%	Share of bottom 20%	Share of top 20% / Share of bottom 20%
Counter factual	.283	.061	.020	.225	.326	.103	3.16
Actual	.253	.054	.018	.238	.337	.100	3.37
Difference	↓.030 (11%)	↓.007 (11%)	↓.002 (10%)	↑.013 (6%)	↑.011 (3%)	↓.003 (3%)	↑.21 (7%)