Migrant Remittances and Household Labor Supply in the Post-Conflict Tajikistan[±]

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Abstract:

This paper studies the impact of remittances on household labor allocations in post-conflict Tajikistan. Using the 2003 Tajik Living Standards Survey, we find that the amount of remittances received by a household has a negative impact on the number of labor hours supplied by men. Our results show no significant impact on labor supplied by women aged 16-65. This is an intriguing result as other studies on remittances and labor supply show that female labor supply is more responsive to change in remittances. Further, women in the conflict affected areas supply more labor per fortnight as compared to women in lesser affected areas. This effect may indicate the substitution of female labor for the labor of men who died in the 1992-1998 armed conflict or left the country during the 1992-1998 conflict. The death toll and migration were predominantly male effects. For men and women an increase in average wage in the community decreases number of hours supplied. This effect is greater for women, a result consistent with other studies on migration and remittances.

JEL codes: J22 - Time Allocation and Labor Supply, F22 - International Migration, F24 – Remittances, O12 Microeconomics Analyses of Household Behavior

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1. Introduction and Motivation: labor market effects and remittances

Temporary labor migration has become an important component of labor market dynamics in countries affected by armed conflict. In addition to flow of people, labor migration is reflected in the large increase in remittances to migrant- and refugee-exporting countries (Goldring, 2003). Without a doubt, these financial flows have a considerable impact on the economic recovery of households in the conflict affected areas. However, the remittances from family members working abroad may also dampen incentives to work for family members who stayed behind by increasing their reservation wages and decreasing the opportunity cost of leisure (Killingsworth 1983).

Our study provides a glimpse into understanding the dynamics of remittances and labor supply in post-conflict Tajikistan. We attempt to answer the following questions: Do migrant-sending households supply fewer labor hours as compared to non-migrant sending households? Is the effect greater for men or women? Do remittances provide older men with an opportunity to retire or allow younger men to fund their education? What individual and household characteristics have a significant impact on individual and household labor supply? Does the impact of these characteristics differ for areas that were lesser and more affected by the conflict? While we also examine labor supply by youth aged 14-15 and the elderly aged 66 and over, our analysis is focused on men and women in the working age group. To explore these questions, we use household and individual-level data from the 2003 Tajik Living Standards Measurement Survey (henceforth, TLSS 2003).

In Tajikistan, remittances from household members constitute 15-17 percent of total household expenditure and are the second largest source of income after wages. Figure 1 shows the distribution of remittances. Households residing in conflict affected areas receive higher amount of remittances than households who live in lesser affected areas. Previous research has shown that remittances are associated with a larger overall household expenditure but the migrant-sending households do not differ from these without migrants in the allocation of household expenditure towards food, education and medical expenses (Justino and Shemyakina, 2008). However, in this study we find here that such households

differ in terms of their labor allocation decisions. Similarly to previous literature, we find that the amount of remittances received by a household has an overall negative impact on the number of labor hours supplied by men aged 16-65. However, this result is significant only for the sample of men who live in the conflict affected areas. Further, remittances do not have a significant impact on labor supplied by women in the working age group. This last result is intriguing as other studies on remittances and labor supply show that female labor supply is usually more responsive to change in remittances (Funkhouser 1992; Amuedo-Dorantes and Pozo 2006; Hanson 2007). Additionally, we find that labor hours of working family members exhibit significantly more variation if a household receives remittances from family members living abroad (Figure 2).

Our study also provides a glimpse into how exposure to armed conflict affected labor market decisions by household and individuals in Tajikistan. At the household level (Tables 4 and 5), men aged 16-65 supply fewer labor hours if a household lives in the conflict affected area. Women who live in the conflict affected areas supply significantly more hours of work than women in the lesser affected areas. At the individual level (Table 9), both men and women who live in the conflict affected areas, work longer hours than those who live in the lesser affected areas. We interpret the higher labor supply on the part of women in the conflict affected areas as a labor substitution effect, whereby female labor replaces the labor of men who died in the 1992-1998 armed conflict or left the country during the war period.

The contribution of this paper is threefold. First, we contribute to the literature on the labor supply effect of remittances on countries of origin by re-affirming the negative impact of remittances on hours of labor supplied by men. Secondly, we show that the impact of remittances on household labor supply remains strong even in the presence of additional shocks to household income, such as armed conflict. Finally, this paper contributes to emerging literature on the impact of civil wars on household welfare. While this literature has advanced understanding on the impact of civil wars on household composition (through deaths, injuries and so forth) and household human capital (through effects on health and education) (see review in Justino, forthcoming), less attention has been paid to the impact of civil war on labor market.

The rest of the paper is organized as follows. Part 2 reviews the relevant literature on the effects of remittances on the labor market participation of women and men. Part 3 introduces the reader to the armed conflict in Tajikistan and trends in labor migration from and remittances to Tajikistan. Part 4 discusses data and descriptive statistics. Part 5 presents the regression specification and empirical results. Part 6 concludes the paper.

2. Prior research on remittances and labor market participation

Prior studies of remittances and migration have found significant changes in labor force participation, labor hours and their allocation across various sectors, in response to increases in remittances, and as compared to non-migrant-sending households (Amuedo-Dorantes and Pozo, 2006; Damon, 2007; Funkhouser, 1992; Rodriguez and Tiongson, 2001). These studies find a decrease in labor hours supplied and labor force participation for working age men and women. While men are found to reallocate their labor hours from formal employment towards potentially riskier activities, such as self-employment, women tend to withdraw their labor from informal labor market activities. The decrease in labor hours supplied and labor force participation is typically found to be larger for women. The authors attribute these impacts to an increase in non-labor income, decreased opportunity cost of leisure and relaxation of credit constraints that allow a greater tolerance of risk and increased participation in self-employment.

Funkhouser (1992) examined the relationship between migration, remittances, labor force and self-employment participation using cross-sectional data from post-conflict Nicaragua. He finds that an increase in remittances has a positive impact on self-employment and negative on labor force participation. Funkhouser attributes the first result to the lower importance of credit constraints and the second to an increase in non-wage income. He finds that for $100 increase in remittance income (from 0) the probability of labor force participation decreases by 2.1 percentage points for males and 5.0 percentage points for females.

Rodriguez and Tiongson (2001) study the effect of having a migrant in a household on an individual probability of labor force participation by household members in urban Philippines. The

authors find that having a migrant member in a household decreases probability of labor force participation of men by 9.4 percentage points. For women this effect is almost twice as large at 18.1 percentage points.

Amuedo-Dorantes and Pozo (2006) examine differences in hours worked in different types of employment by men and women in Mexico. Once endogeneity of remittances is corrected for, they find that remittances are associated with variation of male labor supply across various categories of employment. They find that men supply fewer hours to the formal sector and increase their participation in informal sector. In contrast to men, women in rural areas work fewer labor hours in response to increase in remittances, which leads them to withdraw their labor from the informal sector and unpaid work.

Damon (2007) uses panel data from El-Salvador to study the effect of migration on allocation of labor hours within households. She finds that the decision to migrate affects family's labor allocation for agricultural households, while the amount of remittances received does not have a significant impact. As household engages in migration, it increases labor hours committed to on-farm work and decreases number of hours committed to off-farm employment. The effect is the same for adult men and women and children. While Funkhouser (1992) and Damon (2007) both use data from countries recovering from conflict, they do not explicitly control for the effects of armed conflict in their studies.

Overall, the above mentioned studies show that women reduce their labor supply as a response to migration and remittances at a higher rate than men, who often reallocate their labor hours from formal into self- or informal sector employment. This body of research has been undertaken in peaceful settings where the labor effects of migration decisions amongst household members are analyzed in isolation from other household shocks. But what happens to households in conflict affected countries and regions that experience severe losses in working age male population due to war? In such regions, labor migration decreases the stock of available working age men even further. This additional effect may well lead to a positive relationship between migration of household members abroad and female labor force participation. Women may have to substitute for men in the labor force and aim to replace income

previously brought by men. Such strategy may help households to smooth their consumption, especially, if remittances are received in an erratic fashion and thus, cannot be deemed a reliable source of income.

In these circumstances, migration and labor allocation at the household level are jointly determined. Some of the studies surveyed above use an instrumental variables approach to address similar sources of endogeneity between migration decisions and labor household allocations. Amuedo-Dorantes and Pozo (2006) used per capita count of Western Union offices in the Mexican states interacted with household level education characteristics to increase variability of the instrument at the household level, while Damon (2006) used community level migration and variables correlated with remittances to tackle this problem. In this paper, we use the size of Tajik migrant networks abroad to account for potential endogeneity of household labor market allocation decisions. Before presenting these results, we describe trends in migration and background on civil war in Tajikistan after the independence in 1991.

3. Background: Overview of Remittances and Other Transfers in Tajikistan

The 1992-1998 Tajik armed conflict claimed at least 100,000 of lives. About 18 percent of the country's population was displaced in the first few years of the war, however, the majority of the displaced and refugees returned to their homes by 1995. While fighting during the conflict triggered temporary displacement, the destruction of industries and agricultural assets motivated labor migration of Tajiks to other parts of the former Soviet Union (FSU). Migration to this region was facilitated by the shared Soviet culture, education system and fluency in Russian language. The temporary migration presented many Tajiks with an opportunity to establish social and economic networks outside of Tajikistan. Access to such networks in the recipient countries was in turn associated with higher incomes for migrants and access to better jobs (Munshi 2003; Beaman 2008).

During the past decade, labor migration from and the influx of migrant remittances to Tajikistan have become widespread phenomena. By 2005 almost every family in Tajikistan had sent at least one family member abroad as a migrant worker (IMF 2005). Based on the Tajik official statistical data (Table 1), 492.2 thousand people left the country between 1991 and 2005, which constitutes about 8 percent of

the population. About 83.8% of the migrants left between 1991 and 1998. In the period between 2002 and 2005, the estimated number of Tajik migrants in neighboring countries varied within large margins: from 64,000 of registered Tajik migrants and 26,000 visitors to 600,000 to 800,000, respectively (Kireyev 2006). In the recent years, the demographic composition of migrants started to change. More than 620,000 seasonal migrant workers (about 18% of adult population) annually travel from Tajikistan to Russia, Uzbekistan, Kazakhstan and Kyrgyzstan (Kireyev 2006). In the first few years of the migratory movement, migrants were predominantly middle-aged married males. In the last few years, the proportion of young unmarried men, married older women who leave children behind, and younger women with higher education, has increased (Olimova and Bosc, 2003).

Tajik migrant workers send home amounts that are considerably higher than remittances send by workers in traditionally high remittance countries. For example, private remittances to Bangladesh, Egypt and Morocco do not exceed 10 percent of total GDP, while remittances to Tajikistan are estimated to fall within the range of US$400 million to US$1 billion a year, or 20 to almost 50 percent of total GDP (Kireyev 2006). Remittances from temporary and permanent migrants significantly contributed to reducing poverty rate in Tajikistan between 1999 and 2003 (World Bank 2004). Further, in 2003, remittances and other transfers to households ranked as a second largest income source after wages, and constituted about 10 percent of average household income (World Bank 2004). Table 2 provides details on the size of remittances in relation to various items in the balance of payments of Tajikistan.

Despite the large extent of labor migration from Tajikistan since the 1990s, the significance of remittances for the local economy was noticed only recently due to a sudden surge in registered remittances starting in 2002 (Table 2) when migrants started to use banks to send funds to their families (Kireyev 2006). Official figures are nonetheless likely to misrepresent the true level of remittances in Tajikistan as it is difficult to separate migrant remittances from private transfers (between households) or estimate remittances from informal flows of money. It is estimated that only 25 per cent of remittances go through formal channels. These exclude foreign goods (Olimova and Bosc, 2003). Estimates from household surveys are more likely to record remittances received by households through all channels

(Kireyev 2006). We rely on household data to analyze the impact of remittances on household labor allocation decisions in the next section.

4. Data

4.1. Remittances

To study remittances and their impact on household labor supply, we use household data from the 2003 Tajik Living Standards Measurement Survey. The survey was conducted by the State Statistical Agency of Tajikistan in cooperation with the World Bank and several Tajik and international agencies. It contains detailed information on household composition, employment, consumption and expenditure, migration, private and public transfers for a sample of 4,160 households.

The survey also has detailed information on monetary and in-kind transfers received by each household from family members and institutions, such as NGOs. Transfers from government, such as various pensions and allowances, are accounted for in a separate section of the survey.

In this paper, we focus on the analysis of "external transfers" or remittances that are monetary and in-kind transfers sent by family members living abroad. 9.6 percent of 4,160 households interviewed in 2003 indicate that they received either a monetary or in-kind remittances from a family member located abroad in the last 12 months. 93 percent of these migrant household members live in Russia, while the rest resides in Kazakhstan, Uzbekistan, and other countries. The 2003 data does not contain socio-demographic information on migrant workers who are currently abroad and who send remittances and thus we are not able to control for these in our analysis.[1]

[1] The only information available on individual migrants is the relationship of each to the household head. The majority of migrants fall into three categories: the household head himself or herself, spouses and children of household heads.

4.2. Conflict effects

In order to capture the effects of war and migration on household labor behavior, throughout the analysis below, we divide households into two groups by their degree of exposure to the 1992-1998 armed conflict in Tajikistan, using a conflict dummy variable. This variable is equal to one if a region was severely affected by the armed conflict of 1992-1998, and it is equal to zero is the district was affected to a much lesser extent. This distinction between areas highly and lesser affected by conflict allows us to compare behavior of recipients in the lesser affected areas to more severely conflict affected areas. Conflict affected areas are defined as having experienced several incidents of conflict related activity between 1992 and 1998, such battles between government and insurgent forces, violence against civilian population and destruction of industrial and agricultural assets. The information on conflict events was collected by one of the authors (Shemyakina 2008) based on news reports in local Tajik newspapers in particular, Narodnaya Gazeta and Vechernii Dushanbe, reports of the UN agencies, the U.S. Department of State, human rights organizations and other literature on the Tajik civil war. A possible limitation of this variable is that it may not include all communities that were affected during the war because the published accounts of conflict activity may have overlooked smaller incidents or lesser known communities (Shemyakina 2008). Our analysis may underestimate the war effects for two reasons. Firstly, areas defined as not significantly affected by the conflict may include communities that were affected by fighting. Secondly, even areas that were not affected by the conflict directly have likely experienced spillover effects of the conflict through depressed economic activity, additional demands on resources imposed by refugees and potentially, feelings of insecurity.

4.3 Descriptive statistics

9.6% out of 4,160 households receive remittances from family members living abroad.[2] About 70 per cent of the remittance-receiving households live in conflict affected areas. Households living in

[2] We use both “transfers” and “remittances” to denote the receipt of monetary or in-kind transfer (terminology used in the survey) from family members (donors) living outside of Tajikistan.

conflict affected areas receive on average larger remittances than those living in less affected areas: 79.84 somoni per year as compared to 59.52 somoni per year (the difference is statistically significant at 10% level). For those households reporting non-zero remittances, the average amount of annual monetary and in-kind remittances is almost 819 somoni in the conflict affected areas and about 652 somoni in the lesser affected areas (the difference is statistically significant at 5% level). The distribution of remittances is presented in Figure 1. While the majority of remittances falls in the range between zero and 600 somoni, more households in the conflict affected areas receive transfers over 1,000 somoni per year. As for outliers, seven households in conflict affected areas receive annual transfers of 3,000 somoni as compared to two households in lesser affected areas.

The summary statistics for migrant and non-migrant sending households from the 2003 TLSS are presented in Table 3. Overall, the characteristics of migrant-sending and non-migrant sending households are rather similar with small exceptions. The migrant-sending household is defined as one that reported to be receiving remittances from household members living abroad, and the non-migrant sending household is the one that reported not to be receiving remittances from migrants living outside of Tajikistan. Migrant sending households spend 2 somoni per month less per household member. The value of land owned by migrant-sending households is higher by 307 somoni (significant at 1%). Non-migrant sending households have a significantly higher dependency ratio and receive higher transfers from family members living in Tajikistan as compared to migrant-sending households.

Table 4 provides means and standard deviations of weekly labor hours worked per household member in the relevant age group by migrant-sending status. The labor hours are averaged for the household members in the relevant age group. For example, if a household has three males in the age group 16-65, with the first member reporting 16, another 44 and the last one 126 hours, then the average number of hours worked is 62 hours per week.[3] This information is for hours worked in either farm owned or rented by household member, on own account/household enterprise or in work for non-household member.

[3] The details about survey questions used to construct the dependent variable can be found in Appendix A.

Men age 16-65 spent 16.28 and 27.46 hours working in migrant and non-migrant sending household respectively. This difference is significant at 1% level. Women from migrant sending households spent 3.04 hours fewer working as compared to women from non-migrant sending households (significant at 5% level). The difference is reversed for men ages 66 and above. Men ages 66 and above from migrant-sending households reported to have spend 11.15 hours working as compared to 6.61 hours worked by men from non-migrant sending households (significant at 10% level). There are no significant differences in hours spent in paid employment by adolescents ages 14-15 and women ages 66 and above by migrant-sending status. In the regression analysis presented in the following section, we focus on the 16-65 age group for men and women.

5. Empirical Approach and Results

5.1 Empirical approach

Our empirical strategy is based on Amuedo-Dorantes and Pozo (2006) who use an IV-Tobit model to estimate the relationship between the amount of remittances received by a household and supply of labor hours. The IV-Tobit model allows us to account for the zero-values of labor hours and for the endogeneity of remittance income. Amuedo-Dorantes and Pozo (2006) suggest that remittances may be endogenous due to two reasons. Firstly, remittances may be related to wealth and wealth often determines the choice of labor hours worked. Secondly, the amount of remittances may be determined by the number of labor hours supplied by the family members who stayed back in Tajikistan, where migrants are more likely to support a household with little income from employment as opposed to a household with many earning members. We instrument the amount of remittances with the proportion of community members who have lived abroad in the last five years. The 2003 survey provides information on individual migration within Tajikistan and on periods of time individuals aged 14 and above lived outside Tajikistan. Based on the 2003 TLSS data, 6.4 percent of a total of 16,847 individuals reported that they lived abroad for 3 months or more between 1998 and 2003. On average, they spent 11.7 months abroad. 89% of individual migrants report having gone abroad to look for a better paid job, 5.8% to start a business and

1.8% to study. We use the number of migrants divided by the number of surveyed residents in each primary sampling unit to construct a variable that serves as a proxy for the migrant network outside of Tajikistan. A similar variable was used by Damon (2007) to proxy for the size of migrant network. The larger is the size of the migrant network, the lower should be an individual migrant' adjustment cost at the destination. We estimate the following equation:

(1) $$Y_i = \alpha_0 + \alpha_1 R_i + \alpha_2 Z_i + \alpha_3 Conflict_Area + \varepsilon_i$$

with $\varepsilon_i \sim Normal(0, \delta^2)$ and

$$Y_i = \max(0, Y_i^*),$$

where Y_i is the number of labor hours worked in the last week by household members aged 16-65. R_i is the bi-weekly remittances received by a household in Tajikistan. Z_i is a vector of exogenous household characteristics, such as age, gender of and years of education completed by household head, dependency ratio (number of dependents to number of adults ages 16-65), and household size. We estimate two sets of equations. In Table 5, the dependent variable is number of hours worked by all household members ages 16-65. In Table 6, the dependent variable is number of hours worked by household member ages 16-65. The regressions are estimated separately for men and women. The estimation results are presented in the next section.

5.2 Results: Labor Market Effects of Remittances

The analysis is focused on the effect of the amount of remittances on number of labor hours supplied in the last seven days by all 16-65 year olds. Appendix A describes questions used to construct the number of hours worked. In line with the previous findings in the literature, we expect that an increase in the non-wage household income decreases the labor force participation of both men and women. In the neoclassical model of labor-leisure choice presented by Killingsworth (1983), remittances can be interpreted as non-labor income. Theoretically, an increase in non-labor income should increase

household's purchasing power, increase reservation wages and reduce the chance of employment and hours supplied by remittance-receiving individuals.

The impact of the conflict on labor supply may be two-fold. First, if the conflict affected areas were significantly destroyed during the war, the employment opportunities may also vanish, thereby increasing the unemployment rate. Killingsworth (1983) discusses two effects associated with high unemployment rate during the business cycle. The first one, is a "discouraged-worker effect", where the overall labor force participation falls partially due to an increase in the number of people of working age who are not employed and not looking for jobs. The second effect is called the "added worker effect". The decrease in the labor force participation among males, may lead to an increase in the labor force participation of married women whose husbands are unemployed. Thus, we may expect a decrease in the labor force participation and hours supplied for men and an increase in labor force participation and hours supplied for women from conflict affected areas. Second, if as it often happens, the conflict led to a decrease in the number of men due to deaths, when women may have to enter the labor force in high numbers to substitute for the labor of men who were killed. Additionally, men of working age who stayed alive and live in the conflict affected areas can now demand a higher wage premium due to their scarcity. An increase in wages for men would increase their opportunity cost of leisure and thereby increase labor hours supplied in the market.

5.2.1 Household Labor Supply

In Table 5, we estimate Tobit models with and without IV for the number of labor hours supplied by household members ages 16-65, for females (Columns 1-2) and males (Columns 3-4). We find that overall household male labor supply varies significantly due to changes in remitted income. A one standard deviation increase in monthly remittance income (25.64 somoni) is associated with 5.6 hours decrease in monthly labor hours supplied by household males aged 16-65. This is equivalent to 4.14 somoni per month, or 7.8 percent of mean household expenditure per capita (using the 2003 mean hourly wages for Tajikistan of 0.74 somoni per hour as estimated from the 2003 TLSS data). Since the survey

was conducted in June-July 2003, it is unlikely that men who remain in the migrant households are migrants themselves as labor migrants usually travel through summer and return home in winter.

We do not find any statistically significant impact of remittances on the overall female labor supply. This effect is robust across rural and urban areas. This result may be due to significant differences in labor supply of men and women in Tajikistan. On average, working age women supply 41.20 hours per month in outside employment as compared to 67.16 hours supplied by men in the same age group.

Men in female-headed households supply 10.09 fewer labor hours (significant at 5% level), while women in such households put in 23.73 hours more every 14 days (significant at 1% level). An increase in hourly wage (community level variable) decreases the number of labor hours worked for both, men and women. The effect is stronger for women.

The most compelling results we observe relate to the additional household impact of indirect war effects. Residence in conflict affected areas decreases the amount of labor hours supplied by men at the household level, but increases significantly the number of labor hours supplied by women. Increased hours of work supplied by women in the conflict affected areas are most likely related to necessity to substitute for men lost in the conflict. Human losses during the war and the predominantly male labor migration mean that men became “rarer” and thus more valuable. These factors should increase their bargaining power at home and in the labor market and induce men to wait longer for higher wages and better opportunities.

In the next sub-section we discuss results from observing labor supply at the individual level.

5.2.2 Individual Labor Supply

Labor hours

The descriptive results suggest that receipt of remittances appears to have a significant impact on labor supply of men and women. Firstly, men from the remittance receiving households are less likely to work. Secondly, both, men and women, if employed, work shorter hours than these who do not receive remittances (Tables 6 and 7).

30.6% of men and 52.7% of women ages 16-65 in the non-remittance receiving households reported zero hours worked in the last two weeks as compared to 45.7% of men and 53.1% of women from the remittance-receiving households. Among these who reported non-zero labor hours in the last two weeks (Table 7, Panel B), men in the non-remittance receiving households work 3.6 (significant at 5% level) and women 5.06 (significant at 1% level) more hours every week.

According to Figure 2 there is a large variation in labor hours worked per week in the last 14 days by men and women from the remittance-receiving households. The variation is particularly high for men. It is possible that remittances provide households with security and allow them to engage in the riskier activities or wait longer for a better job to come along and therefore we can observe this variation in labor hours.

Among these who reported zero hours worked in the last 14 days, the top two reasons why men and women did not seek work in the last month, were "student" and "housewife"[4]. The third top reason for men was the belief that there are "no jobs", and for women – "retired". Table 8 reports the reasons the respondent did not look for work in the last month by sex and household remittance-receiving status.

Non-working males in the remittance-receiving households are relatively older than non-working males from the households that do not receive remittances. In the under 50 age group, non-working men in the non-remittance receiving households are two years older (statistically significant at 1% level).

Tobit regressions – labor hours

Table 9 reports results from Tobit regressions where the dependent variable is hours worked by an individual in the last 14 days. In the regressions we control for various family and individual characteristics, such as age, education level, household size, type of employment, relationship to household head, local hourly wages and a dummy for an individual's residence in the conflict affected region. The results are reported by gender for these aged 16-65. The main coefficients of interest are

[4] The "housewife" response would be highly a peculiar choice for men in Tajikistan. Therefore, we are planning to obtain questions in Russian or Tajik to check for the accuracy of translation.

coefficients on the amount of remittances received by the household and the dummy for residence in the conflict affected area.

From Table 9, Panel A we can see that the estimated coefficient on the remittances variable is statistically significant only for men (Col. 1). When we split the sample into more and lesser conflict affected areas, the coefficient on the remittances variable remains significant only for men from the conflict affected areas (Col. 5 and Col. 6). The estimated coefficient on the conflict dummy is positive and statistically significant for both, men and women.

With respect to other covariates, the regression results indicate that men work more hours if they are engaged in farming on their own plot or work for their household's enterprise as compared to working for someone else than a household member.

Further, men in the conflict affected areas work more hours in farming as compared to men from lesser affected areas, while men from the lesser affected areas work more hours if they own the business or it is owned by a household member. The average local wages have a slightly higher negative effect on the labor supply of men from lesser conflict affected areas.

For the sample of men (Panel A, Col 1), working hours are positively and significantly related to residence in the conflict affected areas (Col 1), rural location, individual's age, grades of school completed and dependency ratio. Weekly labor hours are statistically significantly negatively associated with amount of remittances received and local hourly wages.

The sign and significance of the estimated regression coefficients for the sample of women is relatively similar to what is found for men. Labor hours worked are positively and significantly related to an individual's residence in the conflict affected areas (Panel B: Col 1), rural location, individual's age, grades of school completed and dependency ratio. The estimated coefficient on the years of schooling completed is much higher effect than this of men. Women in the areas more affected by the conflict work more hours every week more than women in the lesser affected areas. Again, as in the household level regressions, the remittances received do not have significant impact on the labor supply of women. This last result could be determined by who actually receives and has control over spending of the remittances.

6. Discussion

We trace the impact of international remittances on the labor supply of working age men and women in post-conflict Tajikistan. We account for endogeneity of remittance income in household level regressions and examine differences in the hours worked in their primary employment by men and women aged 16-65 in areas that were significantly affected by conflict and in areas that were less affected, owing to differences in their household remittance income.

The results indicate that higher remittance incomes appear to be associated with a reduced male labor supply in paid employment. Remittances may increase the household budget and lessen household dependency on income from the local labor market. This effect is particularly dominant for males. Women's labor supply in paid employment is not responsive to increases in remittance income. It is possible that remittance income from migrants is uncertain, both its level and the timing of arrival, and this uncertainty is reflected in no significant effects of amount of remittances received on the number of labor hours supplied by women. No effect of remittances on labor supply of women may be explained by higher risk aversion of women or the situation where remittances controlled by men. However, when we take in consideration the combined impact of the war and migration on household labor allocation decisions, we find that women residing in areas more severely affected by the 1992-1998 civil war supply more labor hours as compared to women from lesser affected regions. This effect may indicate substitution of female labor for the labor of males who may have died in the 1992-1998 armed conflict or migrated. It also is possible that that human losses in the war and predominantly male labor migration lead to higher reservation wages for men in the conflict affected areas. Further, household structure and who receives and have control over the allocation of remittances may also play a role. In future work, we plan to explore this question further and also investigate what factors contribute to men withdrawing their labor supply in response to remittance as opposed to women, which should further contribute to advance understanding of migration impacts on countries of origin.

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Fig 1 – Density of non-zero transfers from family members living abroad by household residence. TLSS 2003.

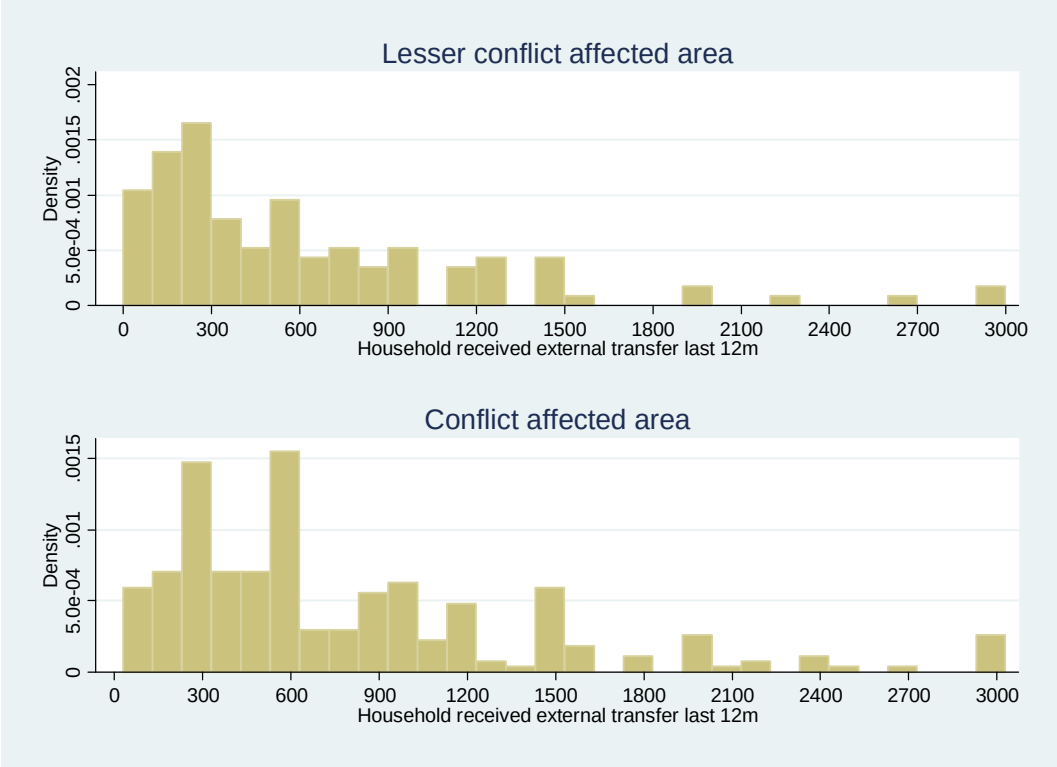

Fig 2–Mean weekly labor hours by sex and household transfer-receiving status, TLSS 2003.

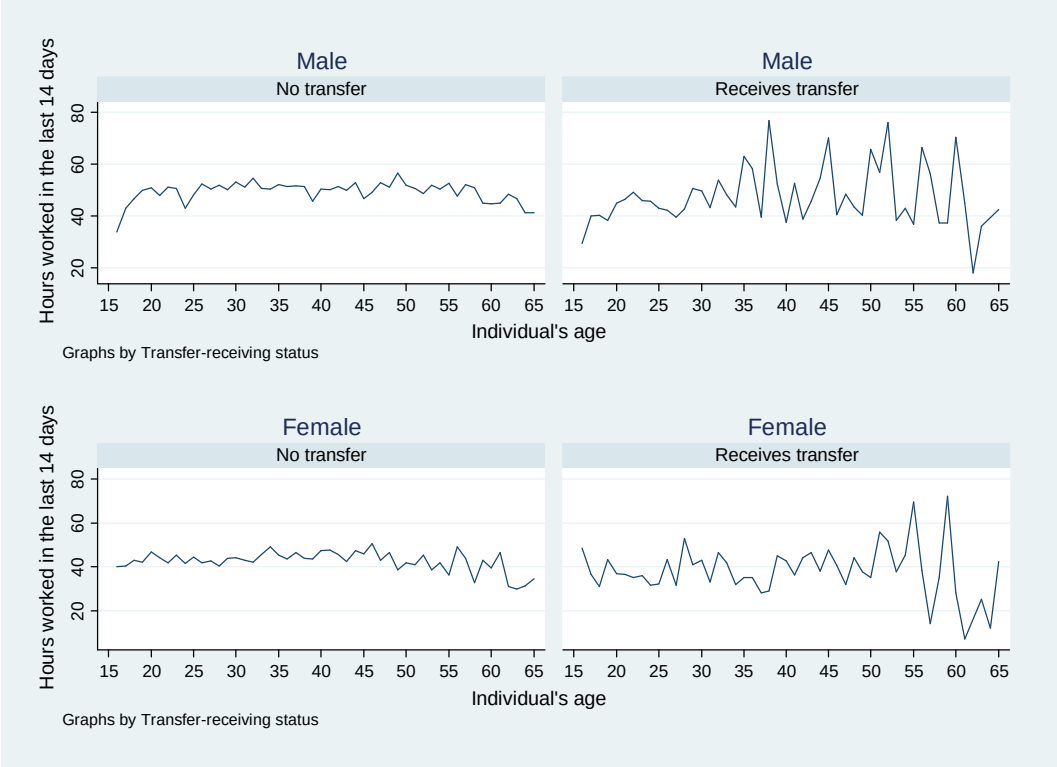

Table 1 - Migration Flows, Tajikistan 1991-2005 (thousand persons)

Year	Arrived	Departed	Migration inflows (+)/ outflows (-)	Including: arrived from abroad	Including: left for abroad	International migration inflows (+)/ outflows (-)
1991	74.9	101.3	-26.4	20.0	48.6	-28.6
1992	51.3	146.0	-94.7	11.3	104.7	-93.4
1993	71.4	146.1	-74.7	12.0	86.3	-74.3
1994	43.3	88.8	-45.5	6.6	55.1	-48.5
1995	37.1	74.9	-37.8	5.5	45.3	-39.8
1996	26.1	53.7	-27.6	3.7	34.1	-30.4
1997	20.2	37.0	-16.8	3.3	21.1	-17.8
1998	16.9	32.3	-15.4	2.7	17.6	-14.9
1999	14.7	28.8	-14.1	1.8	14.7	-12.9
2000	14.5	28.2	-13.7	1.7	14.6	-12.9
2001	16.7	29.1	-12.4	1.7	12.9	-11.2
2002	17.7	30.2	-12.5	1.4	12.0	-10.6
2003	16.9	27.9	-11.0	1.4	10.2	-8.8
2004	15.2	24.6	-9.4	1.1	7.9	-6.8
2005	18.0	27.3	-9.3	1.1	7.3	-6.2

Source: State Statistical Committee (2006).

Table 2 - Migrant Remittances and Their Relative Size in Tajikistan Balance of Payments

	2000	2001	2002	2003	2004	2005
Net Migrant Remittances	*0*	*-1*	*65*	*82*	*133*	*321*
Inflows	1	4	78	146	252	465
Outflows	-1	-5	-13	-64	-119	-144
Gross remittances/ Exports (%)	0	1	11	18	23	42
Gross remittances/ Trade Deficit (%)	3	3	63	72	167	146
Gross remittances/ FDI (%)	3	47	356	456	93	852
Gross remittances/ Net Borrowing (%)	2	70	560	456	-149	932
Gross remittances/ Gross Reserves (%)	1	4	82	108	133	207

Source: IMF and National Bank of Tajikistan (as quoted in World Bank, 2006).

Table 3 - Summary statistics by migrant-sending status

Variable	Migrant-sending hhds			Non-migrant-sending hhds		
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
HH members ages 0-7	399	1.39	(1.46)	3761	1.23	(1.35)
HH members ages 14-15	399	0.30	(0.49)	3761	0.32	(0.52)
HH members ages 16-65	399	4.03	(2.21)	3761	3.43	(2.03)
HH members ages 66 plus	399	0.23	(0.52)	3761	0.24	(0.52)
Age hh head	399	49.79	(14.09)	3761	48.88	(14.92)
Class compl hh head	313	10.35	(3.52)	3681	10.54	(3.93)
Female hh head	399	0.21	(0.41)	3761	0.20	(0.40)
Househ.size	399	6.89	(3.30)	3761	6.22	(3.08)
Dependency ratio (dep-nts/adults 16-65)	399	0.83	(0.70)	3761	0.95	(0.83)
Household members engaged in agriculture	399	0.57	(0.44)	3761	0.53	(0.45)
Total expenditure, somoni	399	334.25	(279.75)	3761	293.29	(211.60)
Total expenditure per capita, somoni	399	52.16	(39.56)	3761	54.16	(43.46)
Household is poor (exp pc<=absolute poverty line of 47.06 som/month)	399	0.56	(0.50)	3761	0.57	(0.50)
Number of donors abroad	399	1.09	(0.34)	3761	0.00	(0.00)
Amount of remittances, last 12 months	399	754.00	(688.49)	3761	0.00	(0.00)
Number of hhd donors in Tajikistan	399	0.07	(0.28)	3761	0.14	(0.45)
Transfers from donors in Tajikistan, last 12 months (somoni)	399	18.74	(112.62)	3761	48.81	(236.46)
HH has donors internally	399	0.06	(0.23)	3761	0.12	(0.32)
Value of land, somoni	399	1532.4	(2475.04)	3756	1225.2	(2251.49)
Value of livestock, somoni	399	1214.1	(2527.03)	3761	1319.4	(7504.66)
Value of assets, somoni	270	19.2	(114.80)	2368	318.6	(4497.69)
Rural residence	399	0.63	(0.48)	3761	0.63	(0.48)
Residence in the conflict affected area	399	0.70	(0.46)	3761	0.69	(0.46)
Prop-n of working age pop-n in psu migrated internally since 1990	399	0.08	(0.14)	3761	0.08	(0.15)
Prop-n of working age pop-n in psu migrated externally since 1998	399	0.12	(0.08)	3761	0.07	(0.07)

Table 4 - Labor hours worked per household member in the relevant age group by household migrant status and age.

Variable	Migrant-sending hhds			Non-migrant-sending hhds			Diff	P-value
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.		
Ages 16-65								
all	391	16.58	(16.07)	3670	27.46	(19.26)	-10.89	(0.00)
women	385	17.86	(20.85)	3596	20.90	(23.56)	-3.04	(0.02)
men	377	16.28	(21.63)	3364	35.53	(24.87)	-19.25	(0.00)
Ages 14-15								
all	111	6.90	(15.52)	1103	5.84	(15.73)	1.05	(0.50)
women	63	6.87	(16.08)	555	5.57	(14.44)	1.30	(0.50)
men	50	6.65	(14.69)	585	6.26	(17.19)	0.39	(0.88)
Ages 66 and above								
all	74	8.07	(17.72)	754	4.73	(13.85)	3.34	(0.05)
women	40	3.33	(12.43)	474	2.36	(8.82)	0.96	(0.52)
men	52	11.15	(21.09)	439	6.61	(17.35)	4.54	(0.08)
Ages 14 and above								
all	399	15.40	(15.50)	3761	24.08	(17.73)	-8.68	(0.00)
women	393	16.46	(19.76)	3699	18.42	(21.51)	-1.96	(0.08)
men	385	15.59	(20.31)	3489	31.64	(24.01)	-16.05	(0.00)

Table 5 - Comparative Tobit Estimates: No IV vs. IV 2 stage values (Marginal Effects)

	ages 16-65: women		ages 16-65: men	
	No IV	2stage IV	No IV	2stage IV
	1	2	3	4
total, remittances from donors living abroad	-0.003	-0.033	-0.026***	-0.200***
	[0.004]	[0.023]	[0.003]	[0.026]
Reports of conflict activity	9.632***	9.914***	-7.321***	-5.042*
	[2.439]	[2.468]	[2.039]	[2.849]
Rural	36.945***	36.599***	12.666***	11.497***
	[2.702]	[2.735]	[2.199]	[3.038]
Age of household head	0.356***	0.349***	-0.075	-0.085
	[0.091]	[0.092]	[0.077]	[0.107]
Years of education completed by household head	1.734***	1.734***	0.610**	0.716*
	[0.339]	[0.342]	[0.285]	[0.396]
Indicator for missing info on education of household head	-5.011	6.128	-88.655***	-22.973*
	[5.898]	[10.282]	[6.387]	[12.312]
Dependency ratio	-11.195***	-11.784***	-19.790***	-23.242***
	[1.408]	[1.488]	[1.313]	[1.884]
Household size	5.098***	5.485***	8.038***	10.088***
	[0.404]	[0.501]	[0.343]	[0.565]
Female, head household	22.519***	23.734***	-19.871***	-10.960**
	[3.001]	[3.164]	[2.961]	[4.279]
Mean hourly wage (PSU level)	-13.686***	-13.578***	-10.911***	-9.908***
	[1.994]	[2.012]	[1.672]	[2.295]
Constant	-64.992***	-65.024***	26.175***	22.863**
	[7.935]	[8.000]	[6.453]	[8.967]
Observations	3981	3981	3741	3741
Wald test of exogeneity:				
chi2(1)		1.790		88.560
P-value		0.180		0.000
Log-likelihood	-14388.54		-17215.254	

Note: * p<0.05, ** p<0.01, *** p<0.001. Source: TLSS 2003.

Table 6 – Distribution of labor hours worked last 14 days, ages 16-65, by remittance receiving status.

Hours worked last 14 days	Males			Females		
	No transfer	Receives transfer	Total	No transfer	Receives transfer	Total
Zero	30.58	45.68	31.82	52.73	53.12	52.77
Greater than 0	69.42	54.32	68.18	47.27	46.88	47.23
Total	100	100	100	100	100	100
N	6,518	770	7,288	5,971	532	6,503

Source: TLSS (2003).

Table 7 – Average weekly labor hours worked in the last 14 days

Panel A: labor hours include zeros					
Mean labor hours	No transfer	Receives transfer	Diff.	P-value	N
Men, 14-15	6.45	6.75	-0.297	(0.906)	661
N	609	52			
Women, 14-15	5.69	6.46	-0.770	(0.689)	650
N	583	67			
Men, 66+	6.58	11.15	-4.573	(0.080)	493
N	441	52			
Women 66+	2.39	3.33	-0.933	(0.537)	517
N	477	40			
Men, 16-65	34.45	25.00	9.447	(0.000)	6,552
N	6010	542			
Women, 16-55	20.54	18.05	2.485	(0.012)	7,351
N	6572	779			
Panel B: Non-zero labor hours					
Mean labor hours	No transfer	Receives transfer	Diff.	P-value	N
Men, 14-15	36.73	29.25	7.479	(0.320)	119
N	107	12			
Women, 14-15	33.87	36.08	-2.216	(0.698)	110
N	98	12			
Men, 66+	39.75	41.43	-1.675	(0.794)	87
N	73	14			
Women 66+	30.03	44.33	-14.307	(0.068)	41
N	38	3			
Men, 16-65	49.72	46.09	3.629	(0.006)	4,458
N	4164	294			
Women, 16-55	43.69	38.63	5.061	(0.000)	3,453
N	3089	364			

Source: TLSS (2003).

Table 8 - Reasons the respondent did not look for work in the last month, ages 16-65.

Main reason did not look for job past month	Males			Females		
	No transfer	Receives transfer	Total	No transfer	Receives transfer	Total
Student	28.30	25.26	27.97	9.70	9.00	9.63
Housewife	23.72	24.23	23.77	72.03	70.95	71.92
Retired	6.50	7.73	6.63	7.19	8.74	7.36
Handicapped	6.69	4.12	6.41	2.48	2.31	2.46
Military	1.67	1.03	1.60	0.03	0.26	0.05
found job, start late	2.41	1.03	2.27	0.09	0.26	0.11
awaiting recall by employer	0.56	0.00	0.50	0.06	0.00	0.05
waiting for busy season	0.93	1.03	0.94	0.21	0.26	0.22
do not want to work	6.63	6.19	6.58	3.00	3.86	3.09
believe no chance for job	0.99	0.52	0.94	0.15	0.00	0.14
no jobs	19.20	19.07	19.18	4.74	4.11	4.68
Other	2.41	9.79	3.21	0.31	0.26	0.30
Total	100	100	100	100	100	100
N	1,615	194	1,809	3,268	389	3,657

Source: TLSS (2003).

Table 9 - Tobit models. Dependent variable: hours worked in the last 14 days. Panel A: Men

	Panel A: Men: 16-65					
	All	All	nonRCA	nonRCA	RCA	RCA
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	(1)	(2)	(3)	(4)	(5)	(6)
Remittance amount	-0.193***	-0.159***	-0.17	-0.053	-0.206***	-0.193***
	-(0.04)	-(0.04)	-(0.10)	-(0.09)	-(0.04)	-(0.04)
Reports of conflict activity	5.580***	4.729***				
	-(1.48)	-(1.41)				
Age	0.330***	0.356***	0.306*	0.402***	0.336***	0.333***
	-(0.06)	-(0.06)	-(0.13)	-(0.12)	-(0.07)	-(0.06)
Rural	12.238***	7.849***	-5.338	-6.219*	17.905***	12.598***
	-(1.39)	-(1.34)	-(3.00)	-(2.90)	-(1.55)	-(1.49)
Female, head household	3.056	2.999	4.790	1.630	3.060	3.793*
	-(1.70)	-(1.61)	-(3.79)	-(3.63)	-(1.86)	-(1.77)
grades of school completed	0.811***	1.095***	0.49	0.445	1.086***	1.512***
	-(0.19)	-(0.18)	-(0.35)	-(0.33)	-(0.23)	-(0.22)
Dependency ratio	5.983***	5.719***	4.202*	4.379*	6.462***	5.968***
	-(0.81)	-(0.77)	-(1.79)	-(1.71)	-(0.89)	-(0.84)
Household size	0.344*	0.054	1.033*	0.700	0.012	-0.22
	-(0.16)	-(0.15)	-(0.41)	-(0.39)	-(0.17)	-(0.16)
hourly wage, psu, no outliers	-5.947***	-7.870***	-3.766*	-7.371***	-7.880***	-8.866***
	-(0.92)	-(0.88)	-(1.62)	-(1.57)	-(1.13)	-(1.08)
Types of employment						
work on a farm owned or rented by		30.075***		24.513***		31.464***
household member		-(1.38)		-(2.87)		-(1.57)
work on own account/		32.695***		36.318***		30.231***
household enterprise		-(1.31)		-(2.70)		-(1.49)
work for non-household member		ref.		ref.		ref.
Constant	-27.097**	-26.574**	-27.545	-26.42	-15.306	-18.514*
	-(8.76)	-(8.37)	-(19.99)	-(19.41)	-(9.38)	-(8.94)
Sigma						
Constant	37.664***	35.447***	40.458***	38.286***	36.012***	33.870***
	-(0.43)	-(0.41)	-(0.90)	-(0.85)	-(0.49)	-(0.45)
Region controls	Yes	Yes	Yes	Yes	Yes	Yes
Relationship to household head	Yes	Yes	Yes	Yes	Yes	Yes
N	6486	6486	1671	1671	4815	4815
chi2	845.60	1750.87	146.59	361.83	818.07	1489.13
P	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Note: * p<0.05, ** p<0.01, *** p<0.001. Source: TLSS 2003.

Table 9 - Tobit models. Dependent variable: hours worked in the last 14 days. Panel B: Women

	Panel B: Women: 16-65					
	All	All	nonRCA	nonRCA	RCA	RCA
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	(1)	(2)	(3)	(4)	(5)	(6)
Remittance amount	-0.032	-0.066	-0.097	-0.078	-0.023	-0.063
	-(0.04)	-(0.04)	-(0.13)	-(0.12)	-(0.04)	-(0.04)
Reports of conflict activity	8.639***	6.441***				
	-(1.88)	-(1.72)				
Age	0.372***	0.374***	0.741***	0.630***	0.293***	0.321***
	-(0.08)	-(0.07)	-(0.18)	-(0.16)	-(0.08)	-(0.08)
Rural	28.210***	16.429***	12.011**	10.095**	32.253***	18.361***
	-(1.78)	-(1.64)	-(4.24)	-(3.91)	-(1.94)	-(1.79)
Female, head household	3.363	4.031*	4.715	-0.074	3.179	5.027*
	-(2.17)	-(1.98)	-(5.57)	-(5.14)	-(2.32)	-(2.11)
grades of school completed	3.963***	4.440***	4.342***	4.994***	3.895***	4.307***
	-(0.31)	-(0.28)	-(0.81)	-(0.74)	-(0.33)	-(0.30)
Dependency ratio	5.140***	3.547***	8.866***	8.661***	4.342***	2.388**
	-(0.91)	-(0.82)	-(2.26)	-(2.03)	-(0.97)	-(0.88)
Household size	-0.421*	-0.497**	-0.971	-0.820	-0.467*	-0.506**
	-(0.20)	-(0.19)	-(0.58)	-(0.53)	-(0.21)	-(0.20)
hourly wage, psu, no outliers	-8.675***	-10.953***	-11.448***	-14.756***	-7.260***	-9.025***
	-(1.12)	-(1.06)	-(2.22)	-(2.10)	-(1.33)	-(1.25)
Types of employment						
work on a farm owned or rented by household member		48.991***		49.593***		48.865***
		-(1.77)		-(4.02)		-(1.98)
work on own account/ household enterprise		55.415***		65.348***		51.734***
		-(1.58)		-(3.68)		-(1.74)
work for non-household member		ref.		ref.		ref.
Constant	-108.221***	-102.958***	-96.870***	-126.093***	-86.148***	-82.720***
	-(10.69)	-(9.90)	-(21.89)	-(21.00)	-(12.48)	-(11.36)
Sigma						
Constant	45.129***	39.992***	50.764***	44.675***	43.051***	38.268***
	-(0.62)	-(0.54)	-(1.48)	-(1.28)	-(0.67)	-(0.59)
Region controls	Yes	Yes	Yes	Yes	Yes	Yes
Relationship to household head	Yes	Yes	Yes	Yes	Yes	Yes
N	7159	7159	1710	1710	5449	5449
chi2	868.01	2569.24	181.90	610.70	761.43	2009.69
P	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Note: * p<0.05, ** p<0.01, *** p<0.001. Source: TLSS 2003.

Appendix A: Construction of labor hours variable

We use the following survey questions to determine if an individual was currently employed (during the last 14 days), type of employment and number of weekly hours supplied in the past 14 days.

A) Definition of "currently employed status" is based on the affirmative answer questions 1, 2 or 3 in Module 5, Part A (as listed below) indicates that an individual was employed during the last 14 days.

Module 5: Labour: Part A: Labour force Participation
1. During the past 14 days, have you worked for someone who is not a member of your household, for example, a public or private enterprise or company, an NGO or any other individual?

2. During the past 14 days, have you worked on a farm owned or rented by you or a member of your household, whether in cultivating crops or in other farm maintenance tasks, or have you cared for livestock belonging to you or a member of your household?

3. During the past 14 days, have you worked on your own account or in a business enterprise belonging to you or someone in your household, for example, as a trader, shop-keeper, barber, dressmaker, carpenter, taxi driver, car wash, etc.?

B) The number of hours worked and the type of enterprise/employer is found from Module 5, Section B, questions 3 and 5.

Module 5, Section B: "Overview last 14 days"
a) information on the characteristics of the employer:

Question 3: "In this work were you working for:"
1. farm owned or rented by household member
2. own account/household enterprise
3. work for non-household member

b) The actual number of hours worked
Question 5: "How many hours a week in the last 14 days did you do this activity?"