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LABOR MARKET OUTCOMES OF NON-MIGRANT MEMBERS IN RESPONSE TO REMITTANCES: EVIDENCE FROM PROVINCIAL CAPITAL OF PUNJAB AND KHYBER PAKHTUNKHAWA (KPK)

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Abstract

This study analyses the effect of remittances on labor market outcome of non-migrant member of household living in two provincial capital cities of Pakistan. This study aims to expand the effect of remittances on labor supply of household's head and labor participation of non-migrant member of household. The labor participation of non-migrant member decompose in likelihood of participate in labor market and likelihood of participate in voluntary unemployment in response to remittances. For empirical analysis, this study used household survey conducted in Peshawar and Lahore. The sample size comprises 300 household having a migrant and data has been collected by using snowball sampling technique. This study uses Two Stage Least Square (2SLS) model due to potential endogenity in remittances. For this purpose, characteristics of the migrant use as instrument to determine the amount of remittances. Furthermore, this study also use Tobit model to estimate the unbiased and consistence estimates. The estimates of the 2SLS and Tobit model suggested that remittances have significantly negative effect on the labour supply of household's head. This indicate the dominance of income effect which state that household substitute work for leisure. Furthermore, this study shows that remittances decrease the likelihood of participation in labor market and increase the likelihood of participation in voluntary unemployment for non-migrant members. This implies that presence of migrant in the household increases the reservation wage which keeps the non-migrant member of the household out of labour force.

Keywords: Remittances, Labour Supply, Labour Participation, Voluntary Unemployment

JEL Classification: J22, C24, F24.

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1. Introduction

Remittance is a financial inflow to home country by the foreign migrant. It is an important source to transfer resources from developed to developing countries. In the developing countries remittance inflow is a major source of transfer resources as compared to Foreign Direct Investment (FDI) and Foreign Aid. Furthermore, it is a primary contributor of foreign reserves which helps to meet the deficit in foreign payment account. It is a reliable source of foreign finance in developing countries than other foreign receipts (Ratha, 2005).

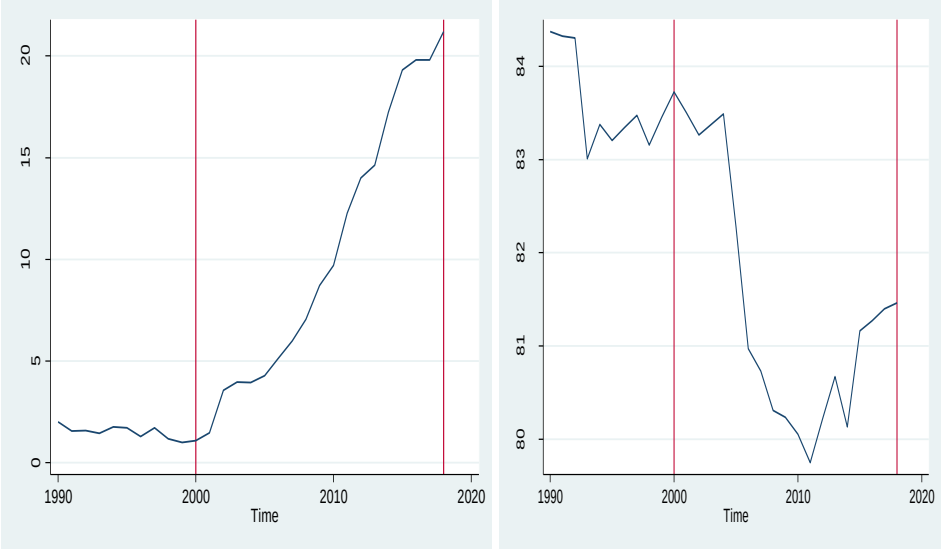
International remittances also contribute in development of underdeveloped and developing economies. According to Hussain and Anjum (2014), remittances inflow stabilise the Pakistan's economy and positively contribute in growth. The process of growth accelerates in a way when remittances are utilized at household level. In this context, recent studies highlight the importance of remittances at aggregate and household level. At macro level, inflow of remittances enhance level of foreign reserves which in turn effect exchange rate (Singer, 2010). Similarly, remittances also contribute in the economic growth and create investment opportunity in the resource country (Al Khathlan, 2010). On the other hand, at micro level remittances effect household' strategy i.e. consumption expenditure, credit constraint, human capital, health, and labour market outcome (see Acosta, 2006; Gorlich et al., 2007; Grigorian and Melkonyan, 2011).

The adverse side of remittances depicted that it cause Dutch disease in the source county by decreasing exports. Remittances enhanced foreign reserves in a country which cause in exchange rate appreciation and making exports relatively less competitive in international market (Makhlouf and Mughal 2013). Furthermore, the study of Cox-Edwards and Rodríguez-Oreggia (2009) suggested that remittances also negatively associated with labor force participation rate of Mexico. Therefore nowadays, recently concern regarding the remittances and labor supply has become a heating debate among researchers to find out the causes of remittances on labor market. It is said that migration of household's member improve the economic conditions of the household because on average individual can earn relatively more in abroad than in home country (Mughal and Makhlouf, 2013). Although, remittances improve the economic position of a household, but a massive amount of remittances increase the reservation wage ("minimum wage at which individuals are willing to participate in the labor market") of individual. So, a rise in the reservation wage effects in turn effect individual's decision to participate or not in labor market (Jadotte, 2009). Similarly, other income (rent, dividend, interest, royalties, lottery etc.) also effect reservation wage of the individual (Borjas, 2008).

The inflow of remittance to Pakistan after 9/11 incident increases definitely from $2 billion in 2000 to $21 billion in 2018. Interestingly, labor force participation rate depict sharp decline in 2000 from 84% to 79% in 2012 and then approaches to 81% in 2018. All these fact give an intuition to conduct a study to explore relationship between remittances and labor force participation. Unfortunately, there are few studies conducted on effect of remittances on labor force participation. According to best of our knowledge, available study in context of Pakistan are (for example Kozel and Alderman 1990; Mughal and Makhlouf, 2013). But these studies either using traditional econometrics approach or focused only effect of remittances on labor supply and ignoring individuals out of labor force. The present study try to fill this gap by using

modern econometric approach named Two Stage Least Square (2SLS) and Tobit model. Furthermore, this study also incorporate the presence of voluntary unemployment among male adults in response of remittances.

Figure 1. Pattern of Remittances and labor force participation rate over the time



Source: World Development Indicator (WDI, 2018)

This study examines the role of remittances on the labour market outcomes of non-migrant member by conducting survey at household level. The decision to participate in labor force is determine by demographic characteristics of individual and household. For this purpose, we collected data from capital of two major provinces of Pakistan named Punjab and Khyber Pakhtunkhawa (KPK). The importance of these two provinces emerges from the fact that they supply about 75% of the total migrants of Pakistan (BOEOE[1], 2019). For empirical analysis, the total effect of remittances decomposed in such a way that remittances effect labour supply of household's head and labour market participation of the non-migrant member of the household other than household's head.

On the empirical side, this study examines the effect of remittances on the labour supply by using simple Ordinary Least Square (OLS) model and finds strong evidence on the potential biasness in the estimate of OLS due to endogeneity in remittances. For this purpose, we instrument the remittances and use the Two Stage Least Square (2SLS) model. By comparing the coefficients of OLS and 2SLS, we notice downward biasness in magnitude of the OLS estimates. This study also truncates the dependant variable labour supply (weekly working hour) from the left and right side and applies the Tobit model. The results of Tobit model also give evidence on the biasness in the magnitude of OLS estimates. Moreover, effect of remittances on labour participation of non-migrant members other than household's head examined by using Logit Model.

[1]Bureau of Emigration & Overseas Employment. Government of Pakistan. 2019

The remaining part of the study is organized as follows: Chapter 2 presents complete description of the literature review; Chapter 3 describes the theoretical relationship between the variables and develops econometric methodology to estimate the effects of regressors. Chapter 4 explains data collection method and descriptive analysis of the variables. Chapter 5 gives the complete interpretation of the estimates. In the last chapter, we draw conclusion of the study and suggest policy recommendations.

2. Review of previous literature on the impact of remittances

The neo-classical model of labor leisure choice elaborates that every individual maximizes his or her utility with two goods "consumption" and "leisure". To maximize utility every individual must face constraint of time endowment regarding work and leisure. Due to this time constraint, an economic trade-off have to face in terms of work and leisure because to consume more goods one must work and give up some of our leisure. Contrary, one can increase the consumption of leisure with the rise in the non-labor income because presence of non-labor increase rise reservation wage of the individual which in turn divert individual's preferences towards leisure and keeps the individual out of labour force (Killingsworth, 1983). Remittances effect the reservation wage which in turn effect the labour participation. As investigate by Kim (2007) that remittances have relatively strong effect on labour participation than labour supply of remittances receiving individual. Similarly, Jadotte (2009) find out that labor supply is negative function of reservation wage and negative effect of reservation wage strong among the women.

The previous literature suggested that association between remittances and labour supply is ambiguous. For instance, the study of Funkhouser (2006) suggested that remittances has insignificant effect on labour supply. Author argued that migrants may increase their expenditure in the host country and failed to remit substantial amount of remittances. Contrary to insignificant effect, some studies suggest that remittances have negative effect on labor supply (see Itzigsohn, 1995; Kim, 2007; Airola, 2008; Grigorian and Melkonyan, 2011). It suggested that remittances divert the preferences of the household's member towards leisure and offering less hour of labor supply. Though remittances effect labour supply and labor participation of individual but presence of migrant in the household also increase likelihood to not participate in labor market.

Although remittances have insignificant effect on quantity of labor supplied but a substantial increase in the amount of remittances divert individual's preferences from wage employment to self-employment (Vadean et al., 2019). Similarly, study of Gorlich et al. (2007) find that migration of a family member increase likelihood of being in-active among the persons left behind. Authors argued that in the absence of participate in labor market, non-migrant members engaging in higher education, farming, childcare, and other household duties.

At macro level the study of Posso (2012) examined the association between remittances and labor supply by using panel data of sixty six developing countries. His study used labour force participation rate as proxy of labour supply and conclude that remittances positively associated with labor supply because remittances overcome the credit constraint and increase the employment opportunities. Supporting this conclusion, Akhter (2018) claim the association of labour productivity with remittances by using the time series data from 1974-2014. His finding suggested that remittances positively

associated with productivity because remittances significantly contribute in physical capital which in turn increase productivity and then labour supply. Whereas, Jackman (2014) analyse effect of remittances on unemployment rate of 19 developing countries in a region Caribbean and Latin America. His findings suggested that remittances have insignificant effect on unemployment rate because unemployment rate follow a non-linear relationship against remittances which indicate the presence of threshold. Nevertheless, presence of remittances below threshold has significantly positive effect on unemployment and above threshold it has significantly negative effect on unemployment.

The presence of remittances increase the income of household which in turn increase the life expectancy, primary/secondary school attainments, reducing infant mortality. The improvement in health, education, and living standard better the position of human development index (HDI) in low and middle income countries (Zhunio et. al., 2012). Contrary, remittances increase consumption but does not increase savings and investment. Moreover, remittances cause moral hazard problem which in turn create dependency and reduce economic growth in long run (Andersen et al., 2007).

The study of Kozel and Alderman (1990) for urban area of Pakistan suggested that remittances have negative effect on labor supply of non-migrant members. Because remittances allow the educated members of the household extend the job search time until they found as per their taste. Contrary, Mughal and Makhlouf (2013) argued that domestic and foreign remittances have not effect on quantity of labour supplied; however, an increase in remittances associated with lower likelihood of labor market participation. Likewise, remittances divert individual's preferences towards self-employment and cultivating one's own land than wage employment.

The objective of this study is to add some extent of labour market outcome in the existing literature. First, it decomposes the effects of remittances on labour supply of household's head and labour participation of non-migrant members other than household's head. In context of labour participation of non-migrant, this study analyses the effect of remittances on the likelihood of being employed and likelihood of being voluntary unemployed. Second, it decomposes the effect of remittances on labour supply on the basis of gender and region. Third, this study looks at the potential biasness in the magnitude of the OLS estimates due to endogeneity in the remittances. For the sake of consistence and unbiased estimate, this study used strong and valid Instrumental Variable (IV) for endogeneity in remittances. Furthermore, this study also captured the biasness in coefficient by using Tobit model and then compared the estimates of OLS with Tobit model. This type of biasness caused when most of observation in the dependant variable (labour supply) is zero (due to zero weekly working hour reported). Finally, this study is first to examine the effect of remittances on labour market outcome by using the primary data. The significance of primary data can be explained in such a way that in our questionnaire we cover a wide range of information on characteristics of household, household's head, migrant, and non-migrant members.

3. Methodology

3.1. Ordinary least square (OLS) Model

To estimate the effect of remittances on labor supply, we use simple functional form of Stern (1986) which derived from indirect utility function of the household's head and semi log labor supply equation:

$$H_i = \alpha + \beta_1 W_i + \beta_2 lnR_i + \beta_3 lnEXP_i + \beta_4 OI_i + \boldsymbol{\beta Z_i} + U_i \quad (1)$$

Where H_i is the weekly working hour of household's head in i[th] household, W_i is hourly wage rate, R_i is monthly remittances received, and OI_i is other income. Similarly, α, β_1, β_2, β_3, β_4, are coefficients, and $\boldsymbol{\beta}$ is a vector of coefficient and $\boldsymbol{Z_i}$ is a vector of variable which include household's head and household's characteristics. The household's head and household's characteristics include age, age square, gender, education, dummy of nuclear family, province, area, and household size respectively. The coefficients of baseline model can be estimate with simple Ordinary Least Square (OLS) method, but the coefficients of the OLS model might not consistent and show biasness in the presence of endogeneity in remittances. Therefore, transformation of OLS model into Two Stage Least Square (2SLS) model is imperative to obtain consistent estimates.

3.2. Two Stage Least Square (2SLS) Model

Our baseline equation is a structural equation because it has an endogenous variable on the right hand side. The potential reverse causality, unobserved heterogeneity, and omitted variable biased cause endogeneity in the variable. Similarly, unobserved characteristics of household's head and household can affect the remittances and labor supply jointly. Therefore, we need to modify our model to overcome the problem of endogeneity in remittances. For this purpose, number of studies suggested Two Stage Least Square (2SLS) model to instrument the remittances at first stage and then put the fitted value of remittances in the labour supply equation in the second stage (see Grigorian and Melkonyan, 2011; Mendola and Carletto, 2012; Funkhouser, 2006; Jadotte, 2009; Stanley, 2014; Dermendzhieva, 2008). To address the problem of endogeneity, baseline equation can transform into reduce form equation (the equation with all exogenous variable) as follow:

$$lnR_i = \pi + \boldsymbol{\mu I_i} + \boldsymbol{\lambda C_i} + V_i \quad (2)$$

Where $\boldsymbol{I_i}$ is the vector of instrumental variable and $\boldsymbol{C_i}$ is vector of control variable, and V_i is error terms. The equation (2) is first stage (reduce form) equation with all exogenous variables to determine the value of the remittances. In the second stage, insert the fitted value of remittances into the baseline equation to obtain the consistent coefficient.

$$H_i = \lambda + \gamma ln\hat{R}_i + \boldsymbol{\omega C_i} + \epsilon_i \quad (3)$$

Where H_i is weekly hour work, $\hat{R}_i$ is fitted value of remittances which determined in first stage with all exogenous variable and C_i is a vector of all the control variable of baseline regression.

3.2.1. Instruments and Control variables

Instruments play a vital role in determination of endogenous variable because presence of strong instrument in the model can increases the possibility of consistent estimates.

The instrument must maintain the assumption that it should be correlated with remittances and uncorrelated with the error terms because it may directly affect labor supply (Dermendzhieva, 2008). The previous literature suggested that some studies used instruments for migration decision (see Grigorian and Melkonyan, 2011). Furthermore, the study of Jadotte (2009) used instruments for migration decision and remittances as well. In our analysis whole data is taken from household having a migrant, so ignore the role of migration decision and instrument the amount of remittances.

The amount of remittances to a household depends upon the number of migrant in a household because a household with more than one migrant can received relatively more remittances (Jadotte, 2009). Similarly, frequency to visit home country in last five year is also determine the stable position of the migrant in the abroad which directly associated with higher amount of remittances (Schumann, 2013). Wealth is also an important determinant of remittances because a migrant from a wealthy family may remit substantial amount of remittances to maintain the standard of living. The wealth index is documented by Jadotte (2009) in his seminal work on international migration, remittances and labor supply. In addition, time period of staying abroad also used as an instrument to determine the amount of remittances, because a person who newly migrated has less opportunity, less familiar to the language and environment than a person migrated years ago. Therefore, the length of time period of staying abroad effect the earning profile of the person and the amount of remittances.

Finally, remittances can increase dependency ratio in a household because in developing countries it is a common belief that the migration of a family's member can improve the economic position of the household. Therefore, the amount of remittances are substantial to meet the expenses of household, so non-migrant members of household not need to participate in the labor market. In this context, remittances can lead to increase number of voluntary and involuntary unemployed person in household. Therefore, the presence of voluntary or involuntary unemployed person in the household pursue the migrant to remit substantial amount of remittances. For this purpose, we generate three dummy variables (i) coded 1 for the presence of unemployed person and zero otherwise; (ii) coded 1 for the presence of voluntary unemployed person and zero otherwise; (iii) coded 1 for the presence of person above 50 years old and zero otherwise[2].

The following control variable included in the regression which effect the labor supply of household's head: (i) labor income of household's head; (ii) non-labor income receipts other than remittances i.e. rent earning, interest earning, pension etc.; (iii) education level of household's head; (iv) age of household's head and it squared value for non-linear relationship; (v) household size; (vi) monthly expense of household; (vii) dummy for gender of household's head; (viii) dummy for relationship of migrant with household's head; (ix) dummy for province; (x) dummy for area.

3.3 Tobit Model

In the baseline model the coefficients of OLS will be inconsistent and biased because many household's head reported zero working hour. The biasness arises in OLS coefficients because we OLS model consider only non-zero value of dependant variable and omit the zero value in the dependant variable, so the assumption that E (U) =0 (mean

[2] Definition of instruments have been given in table no. 5 placed in Appendix

value of error terms is zero) did not meet. To overcome this type of problem Tobit Model proposed by Tobin (1958).

In the literature of remittances and labor supply Tobit model is used by; Hanson, (2007); Jadotte, (2009); Binzel and Assaad, (2011). In our analysis we shall do our data left and right censored; for this purpose, the more suitable model used by Henningsen (2010). Here we are defining the Latent variable:

$$L_i^* = x_i\beta + \varepsilon_i \tag{4}$$

$$L_i^* = \begin{cases} L_i = 0 & if\ \ L_i^* \leq 0 \\ L_i = \ L_i^* & if\ L_i^* > 0 \end{cases} \tag{5}$$

The subscript '*i*' show that no of observations, *L** is an unobserved Latent variable, x_i is the vector of explanatory variable and β is a vector of unknown parameter and ε_i is the disturbance terms.

Now we modify our standard Tobit model into the censored regression model which is normally used when dependant variables are censored into left and right. We can modify our equation (4) as:

$$L_i^* = x_i\beta + \varepsilon_i \tag{6}$$

$$Y_i = \begin{cases} a & if \quad L_i^* \leq a \\ L_i^* & if \quad a < L_i^* < b \\ b & if \quad L_i^* \geq b \end{cases} \tag{7}$$

Where a ≠ -∞ and b ≠ +∞ and 'a' is the lower limit and 'b' is the upper limit of the dependant variable.

3.3 Logit Model

After estimating the effect of remittances on the labor supply of household's head, next to analyse the effect of remittances on the labor force participation of non-migrant member of the household. In this context, Itzigsohn (1995) used simple OLS model to determine the effect of remittances on the number of people in the household who work. But in our analysis, we want to determine the non-migrant (other than household's head) member's probability to participate in the labor force, so we use Logit model as follow:

$$Pi = E\left(Li = 1 \left| Xi\right.\right) = \Lambda(Z) = \frac{e^z}{1 + e^z} \tag{8}$$

L_i is equal to one if household has employed person (other hand household's head) who is participating in the labor force, zero otherwise and Z = Xβ+U. X is a vector of independent variable which include wage rate and age of the household's head, log of remittances, other income, household expenses, dummy of province, dummy of area, number of male in the household and Λ(Z) is logistic cumulative distribution function. Furthermore, Logit model in equation (8) also used to estimate likelihood of voluntary unemployment among non-migrant members of the household in response to remittances by using the same control variable.

4. Data and Descriptive Analysis

For empirical analysis, data collected on characteristics of household, household's head, and migrant by interviewing the respondent. The structured interview method used in which questionnaire filled by researcher instead of respondent. In survey most of the respondent was the head of the household, but somehow the brother or son of the head was also the respondent.

We design questionnaire to obtain the information at household and individual level to cover the wide range of topics. The questionnaire consists on different sections and each section provides specific information on head of household, household's behaviour, and economic status. The section 1 comprise household's head characteristics, other source of income and their utilisation. On the other hand, sections 2 and 3 deal with characteristics of household, migrant, and family of migrant respectively.

We choose province Punjab and Khyber Pakhtunkhwa because they share about 75% of the total migrant (BOEOE 2019). Further, we choose capital of Punjab and Khyber Pakhtunkhwa named Lahore and Peshawar respectively. The choice of Lahore is logical in such a way to compare the behaviour of the habitant of developed city Lahore with relatively less developed city Peshawar. The selection of Peshawar getting importance because statistics shows that in Peshawar migration rate increase up to 4.4 times in 2019 as compared to 2005 (BOEOE 2019). Finally, to observe the household's behaviour in the region where migration rate is relatively high.

We used stratified sampling because in stratified sampling it is possible to split heterogeneous population into the different homogenous groups. We consider that characteristics of population in Lahore and Peshawar are heterogeneous, so we split it into two strata. Each strata contain Lahore and Peshawar and each strata has been further sub-stratified into urban and rural area.

Table 1. Definition of Variable

Variable Names	*Description*
Weekly Working Hour	The weekly working hour computed as number of hour work in a day multiply with weekly working day
Hourly Wage Rate	Monthly labor income of the household's head converted into hourly wage rate by monthly labor income divided weekly working hour *4.33
Log Remittances	Monthly remittances receive by household
Age	Age of the household's head
Age Square	Square the Age of household's head to check the non-linear relationship between age and weekly work
Male (HH head)	Dummy variable for gender to differentiate the labor supply of male and female headed household by coded 1 for male, 0 otherwise
Min. Education	Dummy variable for education to differentiate the labor

	supply of educated and illiterate person by coded 1 if household's head has basic education, 0 for no education (no year of schooling)
Nuclear family	Household reported relationship with migrant like brother, mother, father, son and wife, but we coded 1 for son or wife of the migrant and 0 for otherwise
Province	Dummy variable to differentiate the labor supply of habitant in developed and less developed city by coded 1 if head of the household from Lahore, 0 otherwise
Household Size	Total number of family member in the household excluding the migrant and guest
Area	Dummy variable coded 1 for urban and 0 otherwise.
Log Expense	Monthly expense includes the all expense incurred by the household over the month i.e. expense on education, non-durable goods, and on basic needs etc.
Log Other Income	Other income included the sum of the rental income, income from leasing the land for cultivation, pension, and income from another source. In the sample many of the household reported zero other income, so we added 100 rupees to every household as a gift from abroad which helpful to take the log of other income.
No. of Male	Total number of males in the household irrespective of their age
Employed person	Number of employed persons in the household excluding head of the family and migrant, converted into dummy dependant variable by coded 1 on presence of employed person in the household, 0 otherwise
Voluntary unemployed person	Number of male persons in the household who not willing to participate in the labor market and not studying above the age 18, converted into dummy dependant variable by coded 1 on presence voluntary unemployed person in the household, 0 otherwise

There was no public or private institute which maintain the record of the migrant at region level, so it was not easy to identify the household having migrant. We resolve this problem of identifying the household having migrant by choosing the area in which relatively more household have migrant. After choosing the area in which relatively more household have migrant, we applied snowball sampling technique to collect the data. The snowball sampling also known as chain referral sampling in which researcher asked the respondent to identifying the household with similar trait of interest.

In our sample we gave more weightage to rural area to capture the heterogeneity of work between the self-employed people. On the other hand, in the urban area most of the

people interlink with the public or private job and supply fixed hour of work. In such context, we expand our sample size 55 and 95 from the urban and rural area of Lahore respectively; similarly, 40 and 110 from the urban and rural area of the Peshawar. The description of the variable used in study has been given in the table 1.

Descriptive statistics of on demographic of household, economic status, and migration status has been given in table 2. Weekly working hour has been ranged from 0 to 105 and zero working hour indicate the person out of labor force. Similarly, hourly wage rate varied from 0 to 2,309 and zero hourly wage is belongs to a person out of labor force. There is greater disparities among remittance receiving household as depicted by standard deviation as well as the range (difference between minimum and maximum) of remittances. Similarly, age of household's head also show greater disparities.

Table 2. Descriptive Statistics

Variable	Mean	S.D	Min	Max
Weekly Working Hour	30.14	29.34	0	105
Hourly Wage Rate (HH head)	115.3	223.21	0	2309.47
Remittances	67811.67	65869.02	10000	600000
Age (HH head)	44.64	15.49	18	85
Male (HH head)	0.87	0.34	0	1
Min. Education (HH head)	0.83	0.37	0	1
Nuclear family	0.15	0.35	0	1
Province	0.5	0.5	0	1
Household Size	9.23	5.18	2	34
Area (urban)	0.32	0.47	0	1
Expense	52855	40685.63	10000	300000
Other Income	12996.67	30277.18	0	300000
No. of Male	4.71	2.98	1	19
Employed person	0.56	0.50	0	1
Voluntary unemployed person	0.13	0.33	0	1

In the sample about 87% household has been headed by male and 83% household's head has basic education but 17% reported no education. Among the household, 15% migrant are from nuclear family and 32% households are from urban area. Moreover, 56% household reported the presence of employed person in household, and only 13% reported the presence of voluntary unemployed person in household.

5. Results and interpretation

5.1. Labor supply of household's head

In table 3, the estimates of OLS and 2SLS are presented to compare the biasness in sign and magnitude. We applied Hausman test for the endogeneity of the variable (see appendix table 8), the p-value of the Hausman shows that we did not reject the null hypothesis "variable is exogenous". On the other hand, theoretical evidence of endogeneity in remittances was documented by case et. al.: Jadotte (2009), Grigorian and Melkonyan (2011). We applied Hensen test for the validity of instruments because valid instruments increase the likelihood of consistent estimates. The p-value of the Hensen test indicates that we did not reject the null hypothesis that "instruments are valid". Moreover, we also applied Sargan Test to test the strength of the instrument. The p-value of the Sargan test indicates that we did not accept the null hypothesis that "instruments are weak".

Following by Behrman and Taubman (1985) to test the biasness in the coefficient of remittances, we applied Wald test by using the standard error of the OLS model under the null hypothesis that "both coefficients are same". We did not reject the null hypothesis that both of coefficients are same. The coefficient of remittances in OLS model did not show biasness in sign rather it shows downward biasness in magnitude comparing with coefficient of 2SLS.

In our sample many of the observation consist of the zero working hour, so the presence of zero value in the dependant variable gives inconsistent estimate. To obtain the consistent estimates censored data left and right. We did 123 observation left censored reported zero weekly working hour and 19 observation right censored reported more than 85 weekly working hour. The purpose of the right censored is to avoid the leverage effect because weekly working hour vary from zero to 105.

We applied Tobit model and compared the coefficient with the OLS model. We found that coefficient of remittances in the Tobit model is more than double in magnitude than the coefficient of OLS. We applied simple Wald test using the standard error of the OLS model to test the biasness under the null hypothesis that "both of coefficients are same". The p-value of the test indicates that we rejected the null hypothesis that "both coefficients are same". The coefficient of remittances in the OLS model shows significantly downward biasness by comparing with coefficient of Tobit model.

In table 3 results of OLS, 2SLS, and Tobit model suggested that hourly wage rate has significantly positive impact on the labor supply of the head of household. The sign of the coefficient shows the dominance of the substitution effect of wage change. The presence of substitution effect states that an increase in the wage rate rises the opportunity cost of leisure which leads to decrease the consumption of leisure and work more.

Table 3.Determinants of Household's head Labor Supply (OLS, 2SLS, and Tobit Model)

Variable	(OLS)	(2SLS)	(Tobit)
Hourly wage	0.019**	0.019**	0.042**
	(0.009)	(0.009)	(0.018)
Log Remittances	-7.631**	-11.178*	-13.871***
	(2.946)	(6.128)	(4.917)
Age (HH head)	2.085***	2.074***	3.602***
	(0.554)	(0.541)	(1.035)
Age Square (HH head)	-0.024***	-0.023***	-0.041***
	(0.006)	(0.006)	(0.011)
Male (HH head)	20.274***	19.820***	41.006***
	(4.092)	(4.047)	(10.400)
Min. Education (HH head)	7.392***	6.784*	11.533
	(3.971)	(4.041)	(7.412)
Nuclear family (HH headed by children or spouse of migrant)	-15.522***	-15.266***	-34.250***
	(3.897)	(3.852)	(10.14)
Province (1 for Lahore)	14.677***	15.382***	27.032***
	(3.213)	(3.239)	(5.634)
Household Size	0.219	0.176	0.447
	(0.311)	(0.321)	(0.523)
Area (1 for Urban)	-4.035	-4.590	-6.044
	(3.309)	(3.366)	(5.698)
Log Expense	6.908**	9.640*	9.514*
	(3.416)	(5.529)	(5.654)
Log Other Income	-0.224	-0.257	-0.176
	(0.596)	(0.585)	(0.996)
F Stat/ Wald Chi	14.35	171.99	7.97
R Square	0.2939	0.2903	0.0627
N	300	300	300

Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01

The coefficient of remittances show significantly negative relationship with labor supply which is consistence with previous findings. We converted the semi-log functional form equation's coefficient into the elasticity. The elasticity of weekly work w.r.t remittances is -0.253 which greater than the elasticity estimated by Airola (2008) which was -0.009. The magnitude of elasticity depicted that an increase in remittances by 10% is associated with decrease in weekly working hour by 2.5%. The negative association between remittances and labor supply can be interpreted in such a way that remittances soften the budget constraint of migrant household and allow the non-migrant member to engage in flexible job.

The coefficient of age suggest that an increase in age associated with increase in labor supply. Age can be used as a proxy of experience which indicates that an increase in years of experience associated with higher return from work. Although age has positive association with labor supply, but age squared has negative association with labor supply which state that labor supply increases with age but less than proportionally and follow inverted-U pattern.

The labor supply of male and female headed household are significantly different from each other. The male headed household supply more labor than the female because female specialized in the home production and male specialized in the market production. In a society with higher social fractionalization it is preferred for women to participate in a labor market where she either worked within the four walls of house or a part time flexible job. The strength of relationship between household's head and migrant also effect the labor supply. The head of household (son or wife of the migrant) from nuclear family, then it supplies significantly less labor hour supplied than a head from the non-nuclear family. It has been observed that per capita remittances to household headed by nuclear family higher than non-nuclear one. Hence, the presence of higher per capita remittances increases reservation wage of the wife and son of the migrant which in turn decrease labor supply or keep them out of labor force.

The head of the household with basic education significantly supply more labor than illiterate household who has no year of schooling. Since education is a key variable to determine the individual's preferences towards work because an educated person who receiving remittances and have basic knowledge about the opening of business can get incentive to be self-employed and increase working hour (Schumann 2013). Similarly, a person with higher level of education may get higher wage rate which in turn divert the individual's preferences towards work than leisure.

The geographical location also determines the labor supply of the individual because the coefficient of variable province indicates that labor supply of habitant of Lahore and Peshawar is significantly different. The head of the household from Lahore supply more labor hour because Lahore is more developed and secure than Peshawar. Because individual in Lahore has more opportunity to invest in new business and explore ideas by participating in modern labor market than Peshawar. The coefficient of monthly expenditure shows significantly positive effect on the labor supply of the household's head. It depict that in response to increase in household's expense; head of household should have to work more to earn more for the sake of filling the deficit between income and expense.

5.2 Remittances and Labor Supply of Non-Migrant Member

To estimate the work pattern of the non-migrant member of the household we asked in questionnaire about number of employed members in the household. We coded 1 on the presence of employed person and zero other wise to be convert our model into dummy dependant binary variable. We applied Logit model to find out the effect of remittances on the likelihood to participation of non-migrant member in labor market. The marginal effects of remittances on the labor participation are given in table 4 along with control variable like: labor income of the head, age of the head, province, area, log expense, log other income, and number of males in the household.

In table 4 variable of interest shows that an increase in monthly remittances by 10% leads to decrease in likelihood of participation in labor market by 8.6% for non-migrant employed person. The result suggested that remittances allow the member of the household to avoid unwanted job and extend the period of job search to obtain the job according to his taste. As point out by Itzigsohn (1995) that remittances allow the young member of the household to stay out of labor force and complete their education.

The age of household's head also determine the labor participation of the member of household. The result suggested that a rise in the age of the head of the family insist the member of the family to contribute in the household's income by participating in labor market to compensate the deficit in the household's income due to job retirement of the household's head. Furthermore, household's head with self-employed status will preferred that member of the household should look after and run his business as he got older.

Table 4. Remittances and Labor Participation of Non-Migrant Member of Household-Logit Model Estimation

	Employed	Voluntary Unemployed
Variable	Mfx	Mfx
Labor Income (HH head)	0.00014	0.002**
	(0.001)	(0.001)
Log Remittances	-0.863***	0.787**
	(0.289)	(0.369)
Age (HH head)	0.041***	-0.019*
	(0.010)	(0.011)
Province (1 for Punjab)	1.811***	0.005
	(0.315)	(0.378)
Area (1 for Urban)	-0.078	0.742*
	(0.305)	(0.402)
Log Expense	0.880***	-0.462
	(0.322)	(0.465)
Log Other Income	-0.056	-0.042
	(0.052)	(0.072)
No. of Male	0.261***	0.168***
	(0.077)	(0.059)
F Stat/ Wald Chi	53.90	24.35
Pseudo R Square	0.2121	0.1059
N	300	300

Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01

The variable province shows that a person from Lahore has significantly more likelihood to participate in the labor force than a person from Peshawar. Because non-migrant member from more developed city like Lahore possess more skills and higher human capital as compare to a person from Peshawar. Therefore, in the presence of higher level of skills and human capital a person from developed city has more probability to get employment as per taste.

The variable monthly expense suggested that an increase in monthly expense by 10% lead to increase the likelihood to participate in labor market for non-migrant member of household by 8.8%. It has been observed that an increase in expense increase the burden

on the member of the household to participate in the labor market and shared in the household's income by participating in the labor market. Similarly, the direction of the variable other income is as expected but statistically insignificant. The variable number of males in the household positively associated with likelihood of labour market participation of non-migrant member of household. The coefficient suggested that a rise in the number of males in the household increase the man-power in the household which helpful in generating ideas to expand a business and increase the likelihood of labor market participation.

5.3 Remittances and Voluntary Unemployment

This study aimed to explore the effect of remittances on voluntary unemployment. For this purpose, we asked in questionnaire about the presence of the person in the household who is not willing to participate in labor market and not studying. We coded 1 on the presence of voluntary employed person and zero otherwise to convert our model into dummy dependant binary variable. We applied Logit model to find out the effect of remittances on likelihood of voluntary unemployment. The marginal effects of remittances on voluntary unemployment are given in table 4 along with control variable which we used to determine the labor participation of household's member in previous section.

In table 4 the variable of interest remittances show that an increase in remittances by 10% is associated with increase in likelihood to participate in voluntary unemployment by 7.8%. The result suggested that remittances generate voluntary unemployment because household with migrant received relatively higher per capita income than non-migrant household. Therefore, in the presence of higher income and asymmetric information to migrant about the state and structure of household, the non-migrant member of household can remit substantial amount of remittances to meets their ends and keep themselves out of labor participation. Similarly, non-migrant member of the household participates in the higher education, engaging in the childcare, subsistence farming, and other household duties (Gorlich et al., 2007).

The coefficient of labor income of household's head suggested that an increase in labor income of household's head by 10% is associated with increase in likelihood to participate in voluntary unemployment by 0.02%. It means that an increase in labor income of household's head also responsible for voluntary unemployment. This fact can be explained in such a way that remittances and labor income of household's head is substantial to meet the expense of household and keep the member of household out of labor force. The age of the household's head has significantly negative effect on the likelihood to participate in voluntary unemployment among non-migrant member of the household. The result suggested that an increase in age of household's head is push factor for non-migrant member of household to participate in labor market and contribute in household income after the retirement of household's head.

6. Conclusion

This study analyse the effect of remittances on labor supply of household's head and labor participation of non-migrant member of household by using the primary data collected from the capital of Punjab and KPK. We estimate the effect of remittances on labor supply by using the simple OLS model. We compare the coefficient of OLS with

the coefficient of 2SLS and Tobit model. We apply Wald test and find that there is no biasness in the sign of coefficient of remittances among all the model but biasness in magnitude while comparing with coefficient of Tobit model. The results suggest that remittances have significantly negative effect on labor supply of household's head. The negative association between remittances and labor supply can be interpreted in such a way that remittances soften the budget constraint of migrant household and allow the non-migrant member to engage in flexible job.

The results of Logit model for non-migrant members of household suggest that an increase in monthly remittances associated with decrease in likelihood of participation in labor market for non-migrant employed person. The result suggested that remittances allow the member of the household to avoid unwanted job and extend the period of job search to obtain the job according to his taste. Moreover, an increase in remittances associated with increase in likelihood to participate in voluntary unemployment. Because in the presence of higher income and asymmetric information to migrant about the state and structure of household, the non-migrant member of household can remit substantial amount of remittances to meets their ends and keep themselves out of labor participation.

To conclude, our study demonstrate that remittances have negative effect on the labor supply of the household's head. Furthermore, remittances make adult members in-activate by mentally preparing them not to participate in the labor force. From policy perspective an attention required to channelize the effect of remittance as source of job creation because remittance receiving household face relatively less budget constraint pressure which make them able to enhance human capital. Furthermore, mitigate impediment in establishing a self-employment work and improve the position of ease of doing business.

References

Acosta, P. (2006): *"Labor supply, school attendance and remittances from international migration: the case of El Salvador",* World Bank Policy Research. Working Paper 3903, April.

Airola, J. (2008): *"Labor Supply in Response to Remittance Income: The Case of Mexico",* The Journal of Developing Areas, 41(2), 69-78.

Akter, S. (2018): *"Impact of remittance on domestic labour productivity in Bangladesh",* Progressive Agriculture, 29(1), 33-44.

Al Khathlan, K. (2012): *"The link between remittances and economic growth in Pakistan: A boon to economic stability",* Journal of Economics, Management and Trade, 167-185.

Andersen, L. E., Christensen, B. J., and Tejerina, O. M. (2007): "*A Micro-Level Dynamic Analysis of the Effects of Remittances on Social Mobility, Schooling, Work, Consumption and Investment in Nicaragua",* Paper presented at the Sixth Annual Global Development Conference held in Dakar.

Behrman, J., and Taubman, P. (1985): *"Intergenerational earnings mobility in the United States: some estimates and a test of Becker's intergenerational endowments model",* The Review of Economics and Statistics, 144-151.

Binzel, C., and Assaad, R. (2011): *"Egyptian Men Working Abroad: Labor Supply Responses by the Women Left Behind",* Labour Economics, 18, S98-S114.

Borjas, G. J. (2008): "*Labor economics"*. Boston: McGraw-Hill/Irwin.

Bureau of Emigration and Overseas Employment, Government of Pakistan. Reports and Statistics (2019) [Online] Available at: http://www.beoe.gov.pk/

Cox-Edwards, A., and Rodríguez-Oreggia, E. (2009): *"Remittances and labor force participation in Mexico: an analysis using propensity score matching",* World Development, 37(5), 1004-1014.

Dermendzhieva, Z. (2010): *"Migration, Remittances, and Labor Supply in Albania*", Paper prepared for presentation at the World Bank International Conference on Poverty and Social Inclusion in the Western Balkans WBalkans, Brussels, Belgium, December 14-15, 2010.

Funkhouser, E. (2006): *"The Effect of Emigration on the Labor Market Outcomes of the Sender Household: A Longitudinal Approach Using Data from Nicaragua",* Well-Being and Social Policy, 2(2), 5-25.

Gorlich, D., Omar Mahmoud, T., and Trebesch, C. (2007): *"Explaining Labour Market Inactivity in Migrant-sending Families: Housework, Hammock, or Higher Education?",* (No. 1391). Kiel working paper.

Grigorian, D., and Melkonyan, T. (2011): *"Destined to Receive: The Impact of Remittances on Household Decisions in Armenia",* Review of Development Economics, 15(1), 139-153.

Hanson, G.H. (2007):*"Emigration, Remittances and Labor Force Participation in Mexico", Integration and Trade Journal* 27, 73–103.

Henningsen, A. (2010): "*Estimating censored regression models in R using the censReg Package", R package vignettes collection*, *5*(2), 12.

Hussain, R., and Anjum, G. A. (2014): *"Worker's Remittances and GDP Growth in Pakistan*", International Journal of Economics and Financial Issues, 4(2), 376-38.

Itzigsohn, J. (1995): *"Migrant remittances, labor markets, and household strategies: A comparative analysis of low-income household strategies in the Caribbean Basin",* Social Forces, 74(2), 633-655.

Jackman, M. (2014): *"A Note on the Labor Market Effects of Remittances in Latin American and Caribbean Countries: Do Thresholds Exist?",* The Developing Economies, 52(1), 52-67.

Jadotte, E. (2009): *"International Migration, Remittances and Labour Supply: The Case of the Republic of Haiti"* (No. 2009.28). Research paper/UNU-WIDER.

Justino, P., and Shemyakina, O. (2012): *"Remittances and Labour Supply in Post-Conflict Tajikistan",* IDS Working Papers, 2012(388), 1-37.

Kim, N. (2007): *"The Impact of Remittances on Labor Supply: The Case of Jamaica*", World Bank Policy Research Working Paper, (4120).

Killingsworth, M. R. (1983): *Labor supply* (pp. 302-317). Cambridge: Cambridge university press.

Kozel, V., and Alderman, H. (1990): *"Factors determining work participation and labour supply decisions in Pakistan's urban areas",* The Pakistan Development Review, 1-17.

Makhlouf, F., and Mughal, M. (2013): *"Remittances, Dutch Disease, and Competitiveness: A Bayesian Analysis"*, Journal of Economic Development, 38(2).

Mendola, M., and Carletto, C. (2012): *"Migration and Gender Differences in the Home Labour Market: Evidence from Albania",* Labour Economics, 19(6), 870-880.

Mughal, M., and Makhlouf, F. (2013): *"Labour Effects of Foreign and Domestic Remittances-Evidence from Pakistan",* International Review of Applied Economics, 27(6), 798-821.

Posso, A. (2012): *"Remittances and Aggregate Labour Supply: Evidence from Sixty Six Developing Nations",* The Developing Economies, 50(1), 25-39.

Ratha, D. (2005): "*Workers' remittances: an important and stable source of external development finance*" Remittances: development impact and future prospects, 19-51.

Rodriguez, E. R., and Tiongson, E. R. (2001): *"Temporary migration overseas and household labor supply: evidence from urban Philippines",* International Migration Review, 35(3), 709-725.

Schumann, N. (2013): *"Differential Labor Supply Response to Remittances with Respect to Human Capital",* University of Zurich, Center for International and Comparative Studies (CIS).

Singer, D. A. (2010): *"Migrant remittances and exchange rate regimes in the developing world",* American Political Science Review, 104(2), 307-323.

Stanley, D. (2014): *"Can International Transfers be Problematic? Honduran Remittances and Labour Supply Decisions",* Contemporary Economic Policy, 33(3), 550-570.

Stern, N. (1986): *"On the specification of labour supply functions (pp. 143-189)"*, Cambridge University Press.

Tobin, J. (1958): *"Estimation of relationships for limited dependent variables",* Econometrica: journal of the Econometric Society, 24-3.

Vadean, F., Randazzo, T., and Piracha, M. (2019): *"Remittances, Labour Supply and Activity of Household Members Left-Behind",* The Journal of Development Studies, 55(2), 278-293.

Zhunio, M. C., Vishwasrao, S., & Chiang, E. P. (2012): *"The influence of remittances on education and health outcomes: a cross country study",* Applied Economics, 44(35), 4605-461.

Appendix

Table 5. Definition of Instrument

Variable Names	*Description*
Wealth	The wealth index calculated on the basis of Principal Component Analysis (PCA) by using 8 specific assets. These specific assets includes: presence of car, motorcycle, air conditioner, oven, laptop/computer, refrigerator, ownership of the house, and number of rooms in the household.
Abroad person	Dummy variable coded 1 for the household having more than one migrant, 0 otherwise.
Unemployed Person	Dummy variable coded 1 for presence of unemployed person in the household, 0 otherwise.
Voluntary unemployed	Dummy variable coded 1 for presence of voluntary unemployed person in the household, 0 otherwise.
Time period of staying abroad	Number of years migrant spend at abroad from first migration to till survey time, in case of more than one migrant we use mean value
Frequency of visit	After how many year migrant visit home country, in case of more than one migrant we use mean value
Above 50	Dummy variable coded 1 for presence of person above 50 year in the household, 0 otherwise.

Table 6. Summary of Instruments

Variable	*Mean*	*S.D*	*Min*	*Max*
Wealth	2.61	1.0	0	4.5
Abroad person	0.243	0.43	0	1
Unemployed Person	0.31	0.46	0	1
Voluntary unemployed	0.13	0.33	0	1
Time period of staying abroad	6.82	6.72	.25	40
Frequency of visit	1.3	1.14	0	6
Above 50	0.79	0.41	0	1

Table 7. Test of Biasness and Instruments

Test	*P-Value*	*Chi-Square/Zscore/F Stat*
Test for Biasness		
Wald test under the null hypothesis: $\beta_{ols} = \beta_{2sls}$	0.2296	1.45
Wald test under the null hypothesis: $\beta_{ols} = \beta_{Tobit}$	0.0350	4.49
Hausman test of endogeneity:		
Robust score	0.4933	0.469228
Robust regression	0.5047	0.446136
Test for valid instruments:		
Hensen Test	0.9874	0.94998
Test for weak instruments:		
Sargarn Test	0.0000	11.5338

Table 8. Reduced Form Equation of Remittances with All Exogenous Variable

Variable	*Coefficient*	*Variable*	*Coefficient*
Hourly wage	-0.0002*	Wealth	0.064*
	(0.0001)		(0.033)
Age (HH head)	0.0007	Abroad person	0.426***
	(0.0001)		(0.070)
Age Square (HH head)	0.00006	Unemployed Person	0.082
	(0.0001)		(0.062)
Male (HH head)	-0.097	Voluntary unemployed	0.255***
	(0.085)		(0.094)
Min. Education (HH head)	-0.116	Time period of staying abroad	0.004
	(0.070)		(0.004)
Nuclear family (HH headed by children or spouse of migrant)	0.032	Frequency of visit	0.046*
	(0.086)		(0.024)
Province (1 for Punjab)	0.196***	Above 50	-0.149**
	(0.053)		(0.073)
Household Size	-0.022***		
	(0.007)		
Area (1 for Urban)	-0.138**		
	(0.068)		
Log Expense	0.663***		
	(0.057)		
Log Other Income	-0.014		
	(0.011)		
F Stat/ Wald Chi		19.49	
R Square		0.5642	
N		300	
Standard errors in parentheses		* p<0.1, ** p<0.05, *** p<0.01	