HEC MONTRÉAL

Impact of remittances on households decision to participate in the labor force?

By

Salman Ikram

Management Science

Applied Financial Economics

Master Thesis (M. Sc.)

February 2023

Abstract

Remittances and its labor market effects have remained a particular field of concern. While on the one hand remittances can help create job opportunities and economic growth by being a source of investment, on the other hand they may discourage labor force participation by providing a source of income that is not tied to work. This in turn can create a disincentive for individuals to seek out employment opportunities, leading to a reduction in labor supply and potentially limiting economic growth. This thesis explores the impact of remittances on labor force participation and more importantly examines the reason behind labor market inactivity. Using the Household Integrated Economic Survey (HIES) from Pakistan, our results challenge the assertion that remittance receiving individuals consume more leisure. Instead, we find that remittances not only lead to higher probability for participating in labor force but also reduce the probability of being inactive in the labor market due to leisure seeking preferences.

Key words: Remittances, Pakistan, Household Integrated Economic Survey (HIES), Labor force participation.

Table of Contents

List of Tables

List of Figures

Acknowledgment

I would like to express my sincere gratitude to my thesis supervisor, Dr. Benoit Dostie for his unwavering guidance, patience, and support throughout this entire process. His invaluable insights and expertise have been instrumental in shaping this work.

I would also like to thank the faculty of Applied Financial Economics program for their exceptional guidance and counsel throughout my master's degree.

Finally, I am deeply grateful to my family and friends, whose unwavering support and encouragement have been a constant source of motivation. Their love and understanding have helped me navigate the ups and downs of this challenging journey.

Chapter 1

Introduction

Migration across national borders has truly become an increasingly growing phenomenon over the past decade. Approximately 281 million people (nearly 3.60% of the world's population) live outside of their home country.[1] Correspondingly, remittances have increased manifold and constitute a major component of capital flows to migrant-sending countries especially for developing countries: remittances to low- and middle-income countries stood at USD 554 billions in 2021, representing an increase of 7.9% from 2020.[2] Remittances for developing countries are stable and predictable source of foreign exchange, in comparison to other sources such as investment or portfolio investment, due to it being less affected by global economic conditions or political instability. In Bangladesh, remittances account for around 5.3% of GDP, and in Nepal, they account for around 22.6% of GDP. Similarly, in Haiti, remittances account for around 20% of GDP, while in Pakistan remittances account for around 9% of GDP.[3]

Our research question is important because understanding how the receipt of remittances affects the behavior of households in terms of their participation in the labor force can have significant effects on the economic well-being of households.

[1] *World Migration Report 2022: Chapter 2 - Migration and Migrants: A Global Overview | IOM Publications Platform*. https://publications.iom.int/books/world-migration-report-2022-chapter-2

[2] World Bank Group. (2022, December 05). Remittances grow 5% in 2022, despite global headwinds. Retrieved January 24, 2023, from https://www.worldbank.org/en/news/press-release/2022/11/30/remittances-grow-5-percent-2022.

[3] Personal remittances, received (% of GDP) | Data. https://data.worldbank.org/indicator/BX.TRF.PWKR.DT.GD.ZS?end=2021&locations=PK

By exploring the relationship between remittances and labor force participation, this thesis can help shed light on how remittances influence the decisions that households make about work. For example, remittances may allow households to reduce their reliance on labor income, which could lead to changes in the types of jobs they take, the amount of time they spend working, or the overall labor force participation rates in their communities.

Understanding the impact of remittances on households' labor force participation is particularly relevant in the context of global migration and the growing importance of remittance flows in many countries. This knowledge can inform policies aimed at supporting the economic development of both sending and receiving countries and help promote more effective use of remittances to achieve poverty reduction and sustainable development goals.

While the impact of remittances is mostly seen to have a positive effect on the economy (Adams, 2005; Hildebrandt and McKenzie, 2005; Woodruff and Zenteno, 2007). One particular concern that remains is the labor market effects of remittances and migration. Studies by Funkhouser (1995) and Rodriguez and Tiongson (2001) find that individuals in migrant households tend to work fewer hours with a lower probability of participating in the labor force attributing this to potential disincentive effects of remittances and moral hazard problems. Low labor force participation can pose serious problems to an economy, especially for developing countries, in the form of decreased economic activity, loss of human capital, decreased tax revenues and a dependence on remittances. However, other studies by Posso (2012), Amuedo-Dorantes and Pozo (2006) either show a positive relation between labor force participation and remittances or a shift from formal to informal employment among household men.[4]

[4] Amuedo-Dorantes and Pozo (2006) indicate that households may suffer from migration related expenses and fall in household income, thus leading to increased work effort in the labor market by the remaining members.

The intuition behind the disincentive effect is that remittances receiving households will start to substitute leisure for work and show less work effort according to Rodriguez and Tiongson (2001). Azam and Gubert (2006) characterised this as remaining household members becoming "lazy" due to the wealth from remittances. The individuals start to opt out of labor force and simply wait for their remittances from abroad, thus migration and remittances leading to lower productivity, labor shortages for the economy and a culture of dependency as per Kapur (2005).

We believe that this is not always the case, and the inactivity may also be due to a switch from wage labor to non-wage household labor among the remaining members of the migrant household. According to Görlich et al. (2006) departure of a migrant means that there are two less helping hands for household duties or childcare. This void is usually filled by the remaining members by switching towards household labor or activities from wage labor. However, literature and empirical study on this effect remain limited.

Moreover, the majority of the subject literature, especially in the case of Pakistan, suffers from endogeneity and self selection issues. As remittances are a potentially endogenous variable, a household maybe receiving remittances due to the inactivity of another household member from the labor market. Additionally, unobserved characteristics such as social skills, talent or motivation to work might not only influence being in a remittance receiving household but may also impact the likelihood of being inactive in the labor market. As such this thesis will analyse the response of remittance recipient households in Pakistan towards labor force participation and the role labor disincentive effect plays in households decision making, while trying to tackle potential endogeneity and self selection issues.

For our thesis research, we make use of data from Pakistan due to its high proportion of inward remittances, of about USD 22 billions,[5] accounting for 8% of its GDP. Secondly, the country also has a lower labor force participation rate of 51 %, as compared to countries like Bangladesh with 58.3% labor force participation rate.[6] Furthermore, Pakistan also suffers from high poverty levels and income inequality. According to World Bank, the poverty rate of in Pakistan is estimated at 24% in 2020, with 45 million people estimated to be living below the national poverty line.

In the first step of the analyses, using an instrumental variable estimator to deal with endogeneity problems, we test whether remittances affect the household individuals probability to be inactive in the labor market. Using a household economic survey data set from Pakistan, we find evidence that individuals receiving remittances are more likely to participate in the labor force and be less likely to be inactive. This is contrary to results from previous studies which suffered from endogeneity issues.

The second aim of the paper is to examine the reason for the inactivity, i.e., does the disincentive effect play a role in said inactivity? We find that remittances lead to lower probability of labor disincentive effect, when accounted for endogeneity and self selection issues. Thus, the results showcase that the inactivity from labor force is due to the household members engaging in non-wage household labor or activities rather than the disincentive effect. In conclusion we believe our results provide a good insight on effects of remittances on household labor and the allocation of labor in remittance receiving households.

[5] Pakistan, a country with high proportion of inward remittances of about USD 22 billion accounting for 8% of its GDP and lower labor force participation rate of 52 %. Personal remittances, received (% of GDP) | Data. https://data.worldbank.org/indicator/BX.TRF.PWKR.DT.GD.ZS?end=2021&locations=PK

[6] We chose Bangladesh as a comparison here due to the similar nature of economies between both the nations i.e., GDP, high share of employment in the agricultural sector and high reliance of international inward remittances. https://data.worldbank.org/indicator/SL.TLF.CACT.NE.ZS?end=2018&locations=PK-BD&most_recent_year_desc=true&start=1961

The remaining thesis is structured as follows. Section 2 presents a review of the related literature. Section 3 we present the data, the variables and descriptive statistics and section 4 specifies the econometric approached adopted by the thesis. Section 5 showcases the results of the estimation and its analysis. Finally, section 6 provides robustness check, that is then followed by our conclusion to the thesis.

Chapter 2

Literature Review

2.1 Remittances and the labor market

This section starts of by reviewing the general literature on the impact of remittances on the labor market. We follow by outlining the theoretical considerations behind the disincentive of remittances and a review of the empirical literature regarding the said effect.

One of the earliest studies on the impact of remittances on labor supply was done by Funkhouser (1995). The author found that remittances have a negative effect on labor force participation in Nicaragua. An increase in remittances, from zero to $100, led to a decrease in the probability of labor force participation among males and females by 2.1% and 5% respectively. Rodriguez and Tiongson (2001), using a similar econometric approach, analysed the impact of migration on the labor supply of non migrant household members from Philippines. The authors find that having a migrant in the household reduces the probability, of the remaining members, to participate in the labor force for both males and females.

However, these studies suffer from selection and endogeneity problems. In the case of Rodrigue and Tiongson (2001), the authors assume that only migration determines labor supply, however this is not always the case. For example, in developing countries unemployment especially among the educated urban population is quite common, as such due to this lack of opportunities the individual will seek to emigrate. Hence, in such a case it is the low labor supply

that ends up causing migration. More recent studies try to tackle these issues. Acosta (2006) uses an instrumental variable strategy to conduct a study in El Salvador using household survey data. Acosta finds that remittances lead to a reduction in child labor and female labor supply. Amuedo-Dorantes and Pozo (2006), utilizing an IV-Tobit studied the impact of international remittances on the employment status and hours worked by males and females. Using data from Mexico, the authors show remittances to be negatively affecting female work participation. However, for males the labor force participation simply switches from formal to informal sector. While another study by Posso (2012) uses aggregate level data to address the question of labor force participation and remittances. By conducting the study across 66 developing nations, remittances are found to have an overall positive and significant relationship between remittances and labor force participation rates. However, for males there is an inverted-U relationship, suggesting after a certain income level they start to substitute labor for leisure.

In the case of Pakistan, the literature on the topic has remained limited. Asad et al (2016) examines the relationship between workers' remittances, economic growth and labor migration in Pakistan. Using cointegration analysis they find workers' remittances granger causes the unemployment level. Mansuri (2006) explores the relationship between temporary economic migration and investment in child schooling. Mansuri using data from rural Pakistan finds evidence that children belonging from migrant households are more likely to attend and stay in school. They are also less likely to be involved in economic work and work fewer hours. However, the literature from Pakistan differs from our study as it mainly pertains to impact of remittances on growth of economy, child schooling or child labor. Whereas the scope of our thesis is to study the impact of remittances on labor market participation and further analyse the reason behind said inactivity caused by remittances in the case of labor disincentive effect.

2.2 Remittances and labor disincentive effect

The theoretical foundation behind Disincentive effect can be derived from the neoclassical theory of labor supply. Leisure is assumed to be a normal good and non labor income increases the reservation wage of an individual. If the market wage is not greater than the reservation wage, an individual finds no incentive to work.

In our case receiving remittances acts as a non labor income and increases the reservation wage of the remaining household members. Hence, given similar preferences and wage offers to individuals in remittances receiving and non-remittances receiving households, the disincentive effect suggests that persons in remittance-receiving households are less likely to participate in the labor force.

In the case of developing country, Rosenzweig (1980) and Schultz (1990) show that non-labor income has a negative relationship with labor supply. In studies on labor supply of migrant households, researchers Rodriguez and Tiongson (2001) or Acosta (2006) advocate that non-participation in labor market is highly attributed to leisure consumption. However, Rodriguez and Tiongson (2001) use a simple probit model, thus the results suffer from issues of endogeneity. Azam and Gubert (2006) while reviewing microeconomic evidence concerning migration and remittances in Africa conclude that (i) migration is not an individual decision rather it is a collective decision made by all extended family members to send out the most capable offspring with a view to build the social network and to overcome the difficulties in case of adverse shock with the help of remittances. However, (ii) this insurance system makes the remaining household members exert lower efforts to take care of themselves, being aware that the migrant member will fulfill any shortfall, and they stay out of labor market as they know they will get compensated in case of consumption shortfall.

As seen from the literature on the subject there is a prevalence of endogeneity and self selection issues i.e. (Rodrigue and Tiongson, 2001; Funkhouser, 1995) or lack of research on the reason behind the said inactivity. So far, all the literature covered examines the impact of remittances on labor force participation and points towards labor disincentive effect in case of labor market inactivity. However, to our knowledge, the literature doesn't address the reason of inactivity i.e., labor disincentive effect directly.

2.3 Remittances and labor substitution effect

The labor substitution effect can be derived from a household production labor supply model, which is based on the neoclassical model of labor supply with the inclusion of production and consumption of nonmarket goods (e.g., Cahuc and Zylberberg, 2004). In the absence of a migrant member, the marginal productivity of household may increase for the remainder members. Thus, migration may lead to reallocation towards household labor from wage labor, as opposed to their non migrant counterparts.

Murard (2020) using panel data from rural Mexico examines the effect of international migration on the welfare of family members. He finds evidence that left behind members of a migrant household increase their household labor supply by allocating more time to family farm labor over wage labor. Görlich et al (2006) in their analysis of labor market impact of migration, using data from rural Moldova, find that middle-aged individuals from a migrant household are more likely to be inactive in labor force due to household and farm activities than their counterparts in non migrant households. Thus, providing support for the hypothesis that a migrant household member needs to be replaced by another household member for household activities such as

childcaring or helping out at household farm etc. Whereas other literature does not necessarily estimate the effect of migration and remittance on labor substitution but do touch upon the subject.

Acosta (2006, p. 37) highlights that "a fall in labor supply in migrant households may not be necessarily viewed as a negative effect of remittances in developmental perspective". In effect, he suggested that it could also be due to an increase in parental duties and household production activities. Hanson (2005) discusses that in migrant households there may possibility of increased intra-household specialization of labor in migrant households.

2.3 Cash transfers and the labor market

The literature on cash transfers and the labor market provides a useful reference point for understanding the potential effects of remittances on labor market outcomes. Cash transfers may take various forms, including unconditional or conditional transfers, one-time or recurring transfers, and targeted or universal transfers. Unconditional transfers are provided without any conditions or requirements, while conditional transfers are provided contingent upon the recipient meeting certain criteria, such as sending children to school or attending health check-ups. These transfers are usually provided by governments, international organizations, or NGOs and are typically designed to alleviate poverty, reduce inequality, or promote social inclusion. Cash transfers as such can affect household income and well-being, and thereby impact labor market behavior.

The literature suggests that the conventional economic model, which predicts that a cash transfer will lead to a decrease in work and an increase in leisure due to the income effect, is often not observed in practice. Gentilini et al. (2014) state that the most prevalent social protection policies globally are the government cash transfer both conditional (CCT) and unconditional

(UCT) with 52 countries with a conditional (CCT) and 119 countries with an unconditional (UCT) cash transfer program. Bianchi and Bobba (2013) while studying one of the most well-known governments CCT program i.e., Mexico's PROGRESA, find that the probability of entrepreneurship (self-employment) increases in the short-run due to expected future transfers. However, this impact tends to fade away in the medium term and is only observable in regions with low levels of self-employment prior to the cash transfer, while areas with high levels of self-employment at baseline may experience a negative effect that offsets it. Gertler et al. (2012) find that the program had a positive short-term effect on non-agricultural microenterprises and total agricultural income for the households that received the treatment. However, after 5-6 years since the program's inception, there were no observed effects on wages outside of the treated households. To sum up, the impact of Mexico's CCT program on the labor market results for its adult beneficiaries is, at best, marginal.

Banerjee et al. (2017) conduct a reanalysis of the results of seven randomized controlled trials involving government operated CCT programs in six countries to investigate their impact on labor supply. The authors find that there was no significant effect, either individually or when pooled, on employment or hours of work. Additionally, there was no overall pooled effect on whether work was self-employed or within the family as opposed to outside the household. The study observes a decline in outside work and an accompanying increase in within-household work in PROGRESA, but the opposite trend was observed for Nicaragua's RPS program, which had a similar transfer size. Furthermore, when the outcomes were disaggregated by gender, there were no overall pooled effects on any measures.

de Hoop et al. (2020), while examining two similar unconditional cash transfer programs in Malawi and Zambia targeting labor-constrained households, find that such households tend to

shift away from wage labor and devote more time to their own agricultural work in both Zambia and Malawi. In Zambia, there is a general increase in economic activity, including greater participation in non-agricultural household businesses, but no such changes are observed in Malawi. Prifti et al. (2017) while evaluating the effects of a 2-year child grant program in Zambia find similar switches from off-farm paid work to own-farm labor, along with increases in hired agricultural labor among beneficiary households.

Bertrand et al. (2003) while studying South Africa's old age pension scheme (OAP) observe significant reductions in labor supply, both in terms of employment status (extensive margin) and hours worked (intensive margin), among prime-aged individuals (16-50) living with elderly household members who become eligible for pensions, particularly when the pensioner is female. These effects were more significant for older adults and were most prominent among the oldest sons. According to Ardington et al. (2009), the Old Age Pension (OAP) helps alleviate credit constraints for migration and job search and increases the availability of elderly care for small children, leading to increased employment among prime-aged adults. Meanwhile, Ranchhod (2006) observes that pension eligibility causes significant declines in labor force participation among the elderly, resulting in an increase in flexible working arrangements and a reduction in hours worked among those who remain in the labor force.

Governments often provide job search assistance to the unemployed. While the most prevalent methods involve providing information on job vacancies and aiding in the preparation of resumes, a more proactive strategy is to provide transfers to assist job seekers in covering the expenses associated with job searching. In a study of a transport subsidy program in Ethiopia that aimed to cover the expenses of commuting to the main city center for job searching, Franklin (2015) discovered that the subsidies led to a temporary decline in temporary employment since

individuals spent more time searching for more stable job opportunities. Nevertheless, the program's overall impact on employment was positive, resulting in a 6.7 percentage point increase in employment. Akram et al. (2017) observed that the effects of subsidies are more pronounced in Bangladesh, where they promote labor migration from rural to urban areas, resulting in increased work participation and higher earnings for the subsidy recipients.

In conclusion the commonly held conventional model, which suggests that recipients of cash transfers will reduce work and increase leisure, is not typically what we observe. The only group that appears to come close to this model are the elderly who receive government pensions, but this group is not seen as socially undesirable for wanting more leisure time, and there is little criticism of them for being lazy. On the other hand, prime age adults tend to experience minimal changes in their work hours and earnings when receiving unconditional or conditional cash transfers.

Chapter 3

Data

3.1 Data description

The Household Integrated Economic Survey (HIES) 2018-2019 is the main source of data used for this paper. The data is publicly available secondary data, collected by the Pakistan Bureau of Statistics (PBS),[7] the prime official statistical agency of Pakistan. The data is micro-level and cross-sectional in nature. The HIES 2018-2019 consists of national, provincial, and regional level data and holds information on the characteristics of 171,866 individuals from 24,809 households. It provides key figures on household income, savings, liabilities, and consumption expenditure and consumption patterns at national and provincial level with regional breakdown.

The HIES data provides information about different dimensions of the households and individual members such as personal characteristics like gender, age, martial status, and employment status. Furthermore, it also provides information regarding the household income, education, remittances, and consumption expenditures etc. The HIES uses a two-stage stratified sample design. Two different questionnaires were used for males and females. The female questionnaire has all the questions of the male questionnaire with additional information on health

[7] Pakistan Bureau of Statistics. (2018-19). *Pakistan Household Integrated Economic Survey (HIES) 2018-2019*. https://www.pbs.gov.pk/publication/key-findings-report-pslm-hies-2018-19-national-provincial-level-survey

indicators. This paper uses section 1 (household roster information and employment), section 2 (education), section 8 (transfers received and paid) and section 12 (balance sheet).

For our empirical analysis, we use HIES 2018-2019 with our population of interest being the working age population from 15 – 64 years old. Thus, our final sample consists of 89,263 individuals from 24,809 households.

3.2 Variables and descriptive statistics

To construct the binary variable indicating labor market inactivity, we identify the individuals that are neither working nor seeking work and the individuals occupied in non-wage household labor. Thus, the individuals that are neither employed, nor self employed or unemployed. We use this to construct a binary variable called "Inactive", which helps us to analyse the impact of remittances on labor force participation.[8]

TABLE 1: DEPENDANT VARIABLE INACTIVE STATISTICS

Variables	Definition	Mean			
		Full Sample	Remittances	Non-Remittances	Difference in Means
Inactive	Dummy variable: 1 = Inactive in labor force; 0 = Active in labor force i.e Employed or looking for work	0.59	0.75	0.57	0.18***
N		89,263	6,608	82,655	

Pearson chi2(1) = 810.133 Pr = 0.000

As per Table 1, labor inactivity is more prevalent in households that receive remittances, with 75 percent of remittance receiving individuals being inactive in the labor force as compared to 57 percent inactivity among non-remittance receiving individuals. Furthermore, the Pearson chi-

[8]We chose "Inactive in labor force" as the dependent variable instead of "Active in labor force" simply because we believe it makes more sense, as later in our thesis we examine the reasons behind the said variable "Inactive".

square test indicates that there exists a correlation between remittances and being inactive in the labor market. Which is line with the theory of remittances having a negative impact on labor force participation in accordance with studies from Funkhouser (1995) and Rodriguez and Tiongson (2001).

The labor disincentive effect intends to capture the individuals who are inactive in the labor force simply because they do not wish to work as opposed to the individuals who can not work on the account of them already being engaged in non-wage household labor activities. To proxy for the labor disincentive effect, we rely on two questions from the HIES questionnaire, asking: (1) "Even if did not work last month, did …., have a job or enterprise such as shop, business, farm or service establishment (fixed/mobile) during the last month?" and (2) "What was the employment status?". These questions help us to differentiate between the inactive individuals who simply do not wish to work and the ones that are not working due to them being engage in non-wage household labor activities. For question (1) we select the answer "no not seeking work" and for question (2) and we select the answer "contributing family worker". Thus, we can construct a binary variable "Labor disincentive" indicating individuals that are inactive in the labor market due to them not willing to work or individuals not working due to non-wage home labor.

TABLE 2: DEPENDENT VARIABLE LABOR DISINCENTIVE STATISTICS

Variables	**Definition**	**Mean**			
		(1) Full Sample	**(2) Remittances**	**(3) Non-Remittances**	**(2) – (3) Difference in Means**
Labor Disincentive	Dummy variable: 1 = Not working and not seeking work; 0 = Not working due to home duties and non-wage home labor	0.85	0.93	0.85	0.08***
N		44,882	4,613	40,269	

Pearson chi2(1) = 223.5949 Pr = 0.000

Table 2 showcases some interesting insights about the labor disincentive effect. The table indicates that remittance receiving individuals are more likely to being inactive due to labor disincentive effect as compared to their non remittance receiving counterparts, with labor disincentive inactivity being 93 percent among remittance receiving individuals compared to 85 percent among the non remittance receiving individuals. Similarly, the Pearson chi-square test indicates that there exists a correlation between labor disincentive effect and remittances.

Finally, we use control variables such as age, gender, marital status to account for potential differences in the household due to individual characteristics. Province and urban variables are used to control for regional differences. Additionally, household wealth is another factor that may influence the decision of an individual being inactive. To account for said wealth effect we construct variables using the value of property owned and the total household income in a year. We can view the property household owns as stocks i.e., long term investment and total income as the cash flows available at the household's disposal.

The variables along with some key statistics are given in Appendix Table A-1. The table provides some keen insights of our sample. Around 7 percent of our sample lives in a household that receives remittances from abroad. The education level of individuals is greater in households that benefit from remittances, with higher percentage of having attended school or currently attending school combined with lower percentage of not having any educational school background. Other key features include remittance receiving households having lower percentage of head of households' present (21 vs 25 percent). Head of household is usually the main bread earner of the household. Thus, the lower percentage signifies that he may be the first to migrate with the aim of providing income for the family. Table A-2 in appendix provides complete distribution with amounts for the given descriptive statistics.

TABLE 3: DISTRIBUTION OF YEARLY REMITTANCES, PROPERTY AND TOTAL INCOME FOR A HOUSEHOLD IN PAKISTANI RUPEES (PKR)

Variables	Definition	Mean amount in PKR		
		Full Sample	Remittances	Non-Remittances
Remittances	Total amount of Remittances in a year for a household	27,975.79	377,906	-
Property	Value of property owned by the household.	2,739,023	4,137,665	2,617,686
Total income	Value of total income generated in a year by the household	506,906.4	788124.3	484,309.5
N		89,263	6,608	82,655

Additionally, we use the value of property owned by the household and their total income in a year to proxy for their wealth, as wealth not only effects being in a migrant household but also influences the decision to be inactive in labor market. Table 3 presents the distribution of these variables with respect to remittances. According to the table, remittance receiving households are on average more well off than their non remittance counterparts. This may also highlight why individuals from such households can afford to not be working, as they have additional resources to fall back on. Note that we use logs of property and total income in our estimation to help with the skewness of the variables.

TABLE 4: DISTRIBUTION OF YEARLY REMITTANCE AMOUNT IN PAKISTANI RUPEES (PKR)

Percentiles	Amounts
1%	20,000
5%	60,000
10%	100,000
25%	180,000
50%	300,000
75%	480,000
90%	720,000
95%	900,000
99%	1,800,000
Observations	6,608
Mean	377,906
Standard deviation	364,185.7

Table 4 presents the distribution of yearly remittances among the remittance receiving individuals in our data. The table showcases that among the remittance receiving individuals, 25% of the individuals in our data receive yearly remittance amounting to PKR 180,000 or below. Whereas the median yearly remittance amount received in the data is PKR 300,000 yearly. 75% of the yearly remittances receiving individuals in our data receive remittances upto PKR 480,000 yearly. Finally, 95% of the individuals receiving remittances receive yearly remittances amounting to PKR 900,000 or below. The mean yearly remittance amount is PKR 377,906, while 6,608 of the total individuals in the data receive remittances.

TABLE 5: DISTRIBUTION OF LABOR MARKET INACTIVE INDIVIDUALS WITH RESPECT TO REMITTANCES PER YEAR IN PAKISTANI RUPEES (PKR)

	Percentages		
	(1)	(2)	(1) – (2)
	Inactive in labor market	Active in labor market	Difference
Remittances amount (PKR)			
0	57.5 (47,514)	42.5 (35,141)	15
1 to 100,000	67.7 (396)	33.3 (198)	34.4
100,000 to 500,000	74.2 (3,229)	25.8 (1,123)	58.4*
500,000 to 1,000,000	82.3 (919)	17.7 (198)	64.6
1,000,000 and above	91.1 (185)	8.9 (18)	82.2
N	52,496	36,767	

Total number of individuals in parentheses

TABLE 6: DISTRIBUTION OF LABOR DISINCENTIVE EFFECT INDIVIDUALS WITH RESPECT TO REMITTANCES PER YEAR IN PAKISTANI RUPEES (PKR)

	Percentage		
	(1)	(2)	(1) – (2)
	Labor Disincentive effect	Non-Labor Disincentive effect	Difference
Remittances amount (PKR)			
0	84.8 (40,269)	15.2 (7,245)	69.6
1 to 100,000	86.4 (342)	13.6 (54)	72.8
100,000 to 500,000	92.1 (2,974)	7.9 (255)	84.2***
500,000 to 1,000,000	96.6 (888)	3.4 (31)	93.2
1,000,000 and above	96.8 (179)	3.2 (6)	93.6*
N	44,882	7,614	

Total number of individuals in parentheses.

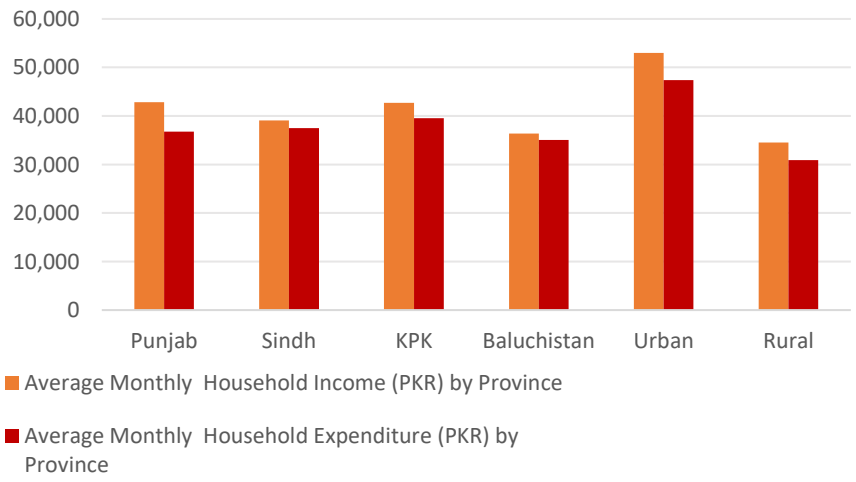
Table 5 and 6 present the distribution of yearly remittances with respect to labor market inactivity and labor disincentive effect. We observe that when yearly remittances are higher, labor market inactivity and inactivity due to labor disincentive effect also tends to be higher. Individuals that receive yearly remittances equal to or more than one million Pakistani rupees (PKR) are associated with the highest levels of labor market inactivity and inactivity due to labor disincentive effect.

Additional household characteristics from the data are given in the table below:

TABLE 7: AVERAGE HOUSEHOLD SIZE

Province/Region	Mean
Urban	5.97
Rural	6.40
Punjab	5.78
KPK	7.52
Sindh	6.23
Baluchistan	8.12
Total	6.24

FIGURE 1: AVERAGE MONTHLY HOUSEHOLD INCOME & EXPENDITURE (PKR)



As per table 7 we can observe that the household size is relatively similar throughout Pakistan except for the provinces of KPK and Baluchistan, which experience slightly higher household sizes. Additionally, the average monthly income and expenditure for the households stands at Rs. 41,545 and Rs 37,159, respectively. There is a stark difference between Urban and Rural households' income and consumption patterns as displayed by Figure 1. The income and expenditure levels are relatively similar throughout the four provinces with Punjab and KPK having slightly higher income and consumption patterns, this makes sense as population and development among these two provinces is far greater than the rest of the country.

However, an in-depth analysis is required to measure the nature and magnitude of these effects, for that reason we employ an econometric approach with the use of 2-stages least square (2SLS) estimation while accounting for endogeneity and self-selection issues.

Chapter 4

Methodology

Our econometric approach involves three parts. In the first part, we test for labor market inactivity and labor disincentive effect in the individuals belonging from remittances receiving households using simple linear probability model (LPM).

In the second part we test for labor market inactivity in the individuals belonging from remittances receiving households using 2-Stages least squares (2SLS) estimation. In the third and main part of the analysis, we test for the labor disincentive effect. We utilize a 2-Stages least squares (2SLS) procedure incorporating inverse mills ratio, that helps us in sample correction and dealing with endogeneity simultaneously.

The explanatory variable of interest in our thesis is a binary indicator for an individual living in a household that receives remittances (Remittances). McKenzie and Sasin state that "information on the amount of remittances is helpful but not essential" (2007, p. 4). As such using a binary variable should still yield similar results.

4.1 Basic linear probability model

The use of linear probability models with OLS estimation in the given context is challenged by econometric issues. Firstly, there is a possibility of self-selection issues. Characteristics like wealth, social skills or work motivation are unobserved and may impact the likelihood of receiving remittances and decision to participate in labor force. Secondly, remittance is potentially an

endogenous variable, a household member may have migrated and sends remittances just because of labor market inactivity of the other members. As such these estimations are not reliable.

However, we use these estimations as a source of comparison, to test the magnitude of our results if endogeneity and selection issues are not accounted for.

A simple LPM for our equations would be the following:

1) Impact of remittances on labor market inactivity

$$Inactive_i = \alpha + \beta_1 Remittances_i + \beta_2 Controls_i + \varepsilon_i \quad (1)$$

2) Impact of remittances on Labor Disincentive effect

$$Labor\ Disincentive_i = \alpha + \beta_1 Remittances_i + \beta_2 Controls_i + \varepsilon_i \quad (2)$$

Where "$Inactive_i$" is the observed binary outcome taking the value of "1" if the individual is neither working nor seeking work, as such is not active in the labor force, and zero if the individual is active in the labor market. Higher inactivity in individuals from remittance receiving households would imply a significantly positive value of the coefficient β_1. The variable "$Labor\ Disincentive_i$" is the observed binary outcome taking the value of "1" if the individuals are not working nor seeking work due to leisure seeking and zero if the individuals are inactive due to being active in household non-wage labor. The variable "$Remittances_i$" is our observed explanatory binary variable taking the value of "1" if the individual belongs from a household that receives foreign remittances and zero if the individual belongs to a household that does not receives foreign remittances. Finally, the vector "Controls" are other explanatory variables which control for observable heterogeneity among the individuals and households.

4.2 Estimation by 2-Stages least square (2SLS)

As mentioned earlier the use of OLS estimation suffer from endogeneity and selection issues. To account for these issues, which are prevalent in previous studies (Rodriguez and Tiongson, 2001; Funkhouser, 1995), we follow recent empirical literatures (e.g Mansuri, 2006, or Görlich et al. 2007) and estimate a linear model for remittances instrumented by regional migration networks in the following form:

$$Inactive_i = \alpha + \beta_1 Remittances_i + \beta_2 Controls_i + \varepsilon_i \quad (3)$$

First stage equation:

$$\widehat{Remittances}_i = \hat{\delta}_0 + \hat{\delta}_1 Controls_i + \hat{\delta}_2 Z_i \quad (4)$$

Where "$Inactive_i$" is the observed binary outcome taking the value of "1" if the individual is neither working nor seeking work, as such is not active in the labor force, and zero if the individual is active in the labor market. Higher inactivity in individuals from remittance receiving households would imply a significantly positive value of the coefficient β_1. The variable "$Controls_i$" are other explanatory variables which control for observable heterogeneity among the individuals and households.

$$Regional\ migrant\ networks = \frac{Total\ emigrants\ from\ the\ province}{Total\ population\ in\ the\ province} \quad (5)$$

$$Z_i = Regional\ migrant\ networks * Share\ of\ male\ adults\ in\ the\ household \quad (6)$$

The variable "Z_i" is used to showcase the instruments used to identify remittances. We instrument the variable remittances with regional migration networks.[9] This is similar to other

[9] To get a network measure that is as reliable as possible, we use data from the 2017 census of Pakistan. We then calculate the share of migrants per province for the 4 different provinces in Pakistan. https://www.pbs.gov.pk/content/final-results-census-2017-0

related studies that also employ regional migrant networks as instruments (Mansuri, 2006; Görlich et al 2007; Hanson and Woodruff, 2003; McKenzie and Rapoport, 2006; Woodruff and Zenteno, 2007). The intuition behind this instrumentation strategy is the high correlation between regional migrant networks and individuals or households' migration choices. As access to these networks help in reducing migration costs and risk, while increasing the economic returns (Munshi, 2003; Winters et al., 2001). This is due to migrant networks working as an information source making it easier to gather information on traveling, hazards, or employment opportunities abroad (Boyd, 1989).

While being correlated with individual migration probabilities, past regional migrant networks are expected to be exogenous to current individual labor market outcomes or leisure decisions. An individual's choice of pursuing leisure over work or engaging in home production is not likely to be influenced by the number of migrants in the region. Thus, we believe regional migrant networks satisfies the condition to be a valid instrument, as it is exogenous to the labor market participation and solely impacts it through its effect on remittances.

However, migrant network constructed from variables in the same data set may be susceptible to unobserved household characteristics. For this reason, we use data from Pakistan population census 2017 and calculate the share of migrants from the provinces of Pakistan. A potential problem with this instrument is that it does not show enough variation at the household or individual level and may be correlated at the provincial level with unobserved variables affecting average labour market. As such we interact the instrument with a household specific variable "the share of male adults in the household", as households with lesser male adults are less likely to have a migrant and as such receive remittances. This is due to mobility and seclusion

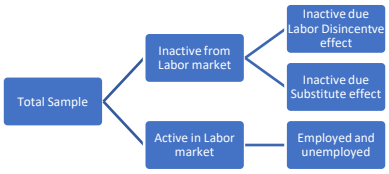
*Regional Migrant network = Total emigrants from the province / total population in the province

restrictions on women typically requiring presence of a male in the household in Pakistan. A similar approach is used by Amuedo-Dorantes and Pozo (2006), Hanson and Woodruff (2003) or Mansuri (2006). We also use share of married adults in the household. We test for the validity of the instruments for overidentifying restrictions. The instruments turn out to be highly significant (F-statistic are always greater than 10), combined with Hansen J statistic test showcase that we don't have a weak instrument problem.[10]

4.3 Taking into account sample selection

The third and main step of our estimation requires a slightly different setup. We aim to explain whether the labor inactivity by choice is due to the labor disincentive effect among the remittance receiving individuals or labor substitution effect. However, estimating using a simple 2SLS method will suffer from sample selection issues. As we only observe labor disincentive effect or labor substitution effect in the subsample of individuals who are inactive from labor market as displayed in Figure 2. These individuals may differ in important unmeasured ways from individuals who are active. For example, individuals who are smarter may be more likely to be active in the labor market than less smart ones as they believe their intelligence will lead them to higher wages etc.

FIGURE 2: FLOW CHART SHOWING THE SELECTION OF STUDY SAMPLE



[10] We also tried other instruments such as number of Western Union offices in the region interacted with the share of secondary and higher education levels in the household. Amuedo-Dorantes and Pozo (2006) used a similar approach. However, these instruments were rejected by the instrumental variable tests. Hence, the regional migration networks were used as an instrument for remittances in the context of Pakistan.

Heckman sample selection

Heckman (1979) provides an easy method for correcting this sample bias due to unobserved sample. The structure of the sample selection consists of two systems of equations. The first equation is the selection equation:

$$Inactive_i^* = \gamma_1 Remittances_{i1} + \gamma_2 Controls_{i1} + u \quad (7)$$

$$Inactive_i = \begin{cases} 1, & if\ Inactive^* > 0 \\ 0, & otherwise \end{cases} \quad (8)$$

Where $Inactive_i^*$ is a latent variable, γ_1 and γ_2 represent the parameters, $Remittances_{i1}$ and $Controls_{i1}$ represent the exogenous variables and u is a random distribution. These two equations 6 and 7 together can be defined as a latent variable model. Equation 8 is the linear model of interest, where we would estimate it using OLS.

$$Labor\ Disincentive_i = \alpha + \beta_1\ Remittances_{i2} + \beta_2\ Controls_{i2} + \varepsilon_i \quad (9)$$

Where $Labor\ Disincentive_i$ is an observable variable in our case that would be individuals inactive due to labor disincentive effect. β_1 and β_2 are used to define the parameters, $Remittances_{i2}$ and $Controls_{i2}$ represent the exogenous variables and ε_i is a random disturbance. In our estimation, we use the same exogenous variables in both the equations (7) and (9). However, we do run a robustness check later with a selection variable "education qualification" and find similar results. We want to estimate β_1 and β_2, considering the fact that the observations for $Labor\ Disincentive_i$ are only observed when $Inactive_i > 0$.

To estimate these models Heckman (1979) provides a two-step procedure:

$$E[Labor\ Disincentive_i | Inactive_i > 0, Remittances_{i2} + Controls_{i2}] =$$

$$\beta_1\ Remittances_{i2} + \beta_2\ Controls_{i2} + \rho\sigma_\varepsilon\hat{\lambda} \quad (10)$$

Where $\lambda = \left(\frac{\varphi(\gamma_1 Remittances_{i1} + \gamma_2 Controls_{i1})}{\Phi(\gamma_1 Remittances_{i1} + \gamma_2 Controls_{i1})}\right)$ is the inverse Mills ratio evaluated at $Remittances_{i2}$ and $Controls_{i2}$. φ and Φ are the normal density and cumulative distribution functions. ρ is correlation between the unobserved determinant u and ε. If the coefficient of inverse Mills ratio is significant then that means, there is selection bias.

However, the Heckman selection model does not account for the endogeneity in the explanatory variable, that in our case is remittances.

2SLS with sample selection

While the Heckman selection model does help us to deal with the selection issues it does not provide a solution to the endogeneity problem. As such we employ an approach similar to Heckman correction.[11] This approach helps us to simultaneously deal with selection and endogeneity problems.

In our estimation we begin by presenting the equations of interest below and then use them to derive our estimation equation. This allows us to estimate the labor disincentive effect while accounting for endogeneity and sample selection issues. As mentioned, before we capture the effect by the binary variable "labor disincentive" by constructing it around the individuals that are not working nor seeking work as opposed to those that are active in household non-wage labor.

[11] Wooldridge (2010) in section "19.6.2 Endogenous Explanatory Variables" provides an alternate approach to Heckman sample correction to account for both endogenous variable and selection issues.
Wooldridge, J. M. (2010). *Econometric Analysis of Cross Section and Panel Data* (2nd Edition). MIT Press.

As this variable is present only in the subsample of the population who are inactive it suffers from selection issues.

Equations of interest:

$$Labor\ Disincentive_{i1} = \beta_1 Controls_{i1} + \alpha_1 Remittances_{i2} + u_{i1} \quad (11)$$

$$Remittances_{i2} = \beta_2 Controls_{i2} + v_{i2} \quad (12)$$

$$Inactive_{i3} = 1[\beta_3 Controls_i + v_{i3} > 0] \quad (13)$$

We start of by defining our structural equation of interest i.e., equation (11). Labor disincentive variable is only observed in the subsample of individuals that are inactive in the labor market and as such suffers from selection issues. Additionally, the variable remittance is also potentially endogenous thus making the results bias if the equation is estimated on its own.

Equation (12) is the linear projection for the potentially endogenous variable "$Remittances_{i2}$". The vector "$Controls_{i2}$" is used to represent the explanatory and instrumental variables from equation (4). Equation (12) helps us to account for potential endogeneity in the model and thus resolve the endogeneity issue in our model. However, we still have the selection problem to deal with as we only observe labor disincentive variable in the individuals who are inactive from the labor market.

Equation (13) helps us to correct for the said selection issue. We use the equation as our selection equation, it is used to model the selection process and estimate the probability of being selected in the sample based on observed and unobserved characteristics of the individual. The coefficients from selection equation (14) are used to calculate the inverse Mills ratio, which is then included as an explanatory variable in the outcome equation (11). The inverse Mills ratio is used to correct for the selection bias in the outcome equation (11) by capturing the relationship between

the unobserved characteristics that affect selection and the unobserved characteristics that affect the outcome of interest Labor disincentive.

In our case remittances are generally available whether the person is inactive or active in the labor market. We only observe labor disincentive effect when the individual is not working nor seeking work (Inactive = 1). If remittances and labor disincentive were always observed along with "Controls" then we could simply estimate equation (11) with 2SLS if remittances are endogenous. However, as that is not the case, we move on two deriving our estimation equation.

Deriving an estimation equation:

$$Labor\ Disincentive_{i1} = \beta_1 Controls_{i1} + \alpha_1 Remittances_{i2} + g(Controls_i, inactive_{i3}) + e_{i1} \quad (14)$$

Where $g(Controls_i, inactive_{i3}) = E(u_{i1}|Controls_i, inactive_{i3})$ and $e_{i1} = u_{i1} - E(u_{i1}|Controls_i, inactive_{i3})$. By definition $E(e_{i1}|Controls_i, inactive_{i3}) = 0$. It turns out that we do know $g(Controls_i, 1)$ up to some estimable parameter: $E(u_{i1}|Controls_i, inactive_{i3}) = 1 = \gamma_1 \lambda(\beta_3 Controls_i)$. Since β_3 can be consistently estimated by using probit of $inactive_3$ on $Controls_i$ (using the entire sample), we can have the following procedure:

(a) Obtaining $\hat{\beta}_3$ from probit of "$Inactive_{i3}$" equation using all observations. Allowing us to obtain the estimated inverse mills ratio, $\hat{\lambda}_{i3} = \lambda(Controls_i \hat{\beta}_3)$.

(b) Using the selected subsample (for which we observe both $Labor\ Disincentive_{i1}$ and $Remittances_{i2}$) and estimate the given equation using 2SLS:

$$Labor\ Disincentive_{i1} = Controls_{i1} B_1 + \alpha_1 Remittances_{i2} + \gamma_1 \hat{\lambda}_{i3} + error_i \quad (15)$$

We test the hypothesis for no selection problem (allowing remittances to be endogenous or not), $H_0: \gamma_1 = 0$, using the 2SLS t statistic for $\hat{\gamma}_1$. When $\hat{\gamma}_1 \neq 0$, standard errors and test statistics should be corrected for the generated regressors problems. In our case the generated variable is significant implying the selection issue has been corrected. This approach can be applied to any kind of endogenous variable, including binary and other discreet variables as the reduced form for $Remittances_{i2}$ is a linear projection.

Chapter 5

Results

5.1 Remittances and labor market inactivity

We start of by estimating whether living in a remittance receiving household is associated with a lower probability of labor market participation. Table 8 presents the estimates for the impact of remittances on labor market inactivity using 2SLS and the OLS for comparison. The complete estimation output is displayed in table A-3 in the appendix. At first glance, using an OLS estimation shows that remittances indeed lead to a lower likelihood of labor force participation among individuals from remittance receiving households, i.e., they have 6 percentage points more probability of being inactive in the labor force. This result is inline with earlier studies such as Funkhouser (1995) and Rodriguez and Tiongson (2001).

However, when we adjust for endogeneity using instrumental variables, we find that remittances, contrary to popular belief,[12] lead to an increase in labor force participation. Remittance receiving household individuals are 15 percentage points less likely to be inactive from the labor market as compared to those who don't receive remittances. Our findings are more in line with study by Posso (2012), who also finds migration to an increase in labor force participation. This can be explained by the fact that migration abroad usually have some monetary costs tied to them in terms of travel, housing, job search at the destination costs etc. Thus, the non

[12] Studies by Acosta (2006), Rodrigue and Tiongson (2001) and Amuedo-Dorantes and Pozo (2006)

migrant family members increase their labor supply in order to fund the migration costs of the migrant family member.

When using OLS, a decrease in labor activity can be attributed to the fact that households are able to alleviate their liquidity constraints. This implies that households can keep their children in school for a longer duration and reduce child labor. Yang (2008) provides a clear example of this, where Filipino households with migrants abroad experienced exchange rate shocks during the Asian financial crisis, resulting in households with migrants in some destinations experiencing a sudden increase in remittances compared to households with migrants in destinations where the local currency did not appreciate against the Philippine peso. Yang finds that households receiving more favorable shocks keep their children in school for a longer duration and reduce child labor hours. This phenomenon could be attributed to a pure income effect or a liquidity constraint effect, which prevented households from investing as much as they would have liked in their children's education.

On the other hand, using migrant networks as an instrumental variable result in an increase in labor activity. As previously mentioned, regional networks can lower migration costs and risks, leading to an increase in migration. Thus, the general equilibrium effect may contribute to the rise in labor activity. The fact that other community members also receive cash transfers can have further impacts on an individual's labor supply. These effects could either increase the amount worked (e.g., if other members cut back on hours, wages will increase; spending by other community members may act as a demand shock for those running their own businesses) or decrease the amount worked (the value of leisure may increase if friends are also not working) e.g., Mishra (2007) and Akram et al. (2017).

TABLE 8: EFFECT OF REMITTANCES ON THE PROBABILITY OF BEING INACTIVE

	Inactive	
	OLS	**2SLS**
Remittances	0.064***	-0.149***
	(0.005)	(0.042)

Standard errors in parentheses, we use robust standard errors to account for heteroskedasticity
*** indicate significance at a 1% level, ** at a 5% level, * at a 10% level
Note: The complete estimation with control variables is given in the appendix table A-3

Additionally, we find that males are 50 percentage points less likely to be inactive in the labor market. This is in line with the societal and cultural norms of Pakistan, where males are seen to be the primary bread earners of the family. When we look at age there appears to be an inverse relationship with being inactive. However, age square has a positive effect on being inactive. It seems age has an inverse U relation between being inactive, as age increases an individual is more probable to be inactive. This makes sense as old age individuals usually seek leisure over working. Being a household head leads to a lower likelihood of being inactive, usually household heads are the primary bread earner in the family as such they prefer to work to provide for the family. Education plays a negative role in being inactive, as individuals with having some level of schooling in the past are less likely to be inactive as compared to the individuals with no schooling. Finally, our two indicators for wealth "log of property" and "log of total income" both have positive relationship with being inactive. This may be due to the fact that individuals from wealthier households can afford to be inactive as they have additional resources to fall back on in the form of wealth. We find similar relationship between the control variables and being inactive when we use an OLS approach or compare them to previous literature (Görlich et al, 2006 and Rodriguez and Tiongson, 2001).

The first stage estimates of 2SLS showcase that our instruments are statistically significant. We find that our instrument "migrant network * share of male of adults in a household" negatively

impacts the likelihood of receiving remittances, whereas the instrument "migrant network * share of married adults in a household" has a positive impact on the likelihood of receiving remittances. This may be due to a number of reasons such as having higher share of male adults in a household would mean more sources of income and shared financial responsibilities as such the need for remittances would be lower. Whereas higher share of married adults would mean greater financial responsibilities such as caring for children and elderly family members as such may have a higher need for remittances in order to meet the household expenses.

Other determinants show that males are less likely to receive remittances, this makes sense as males are usually the ones to migrate and send remittances, as they are the primary bread earners of the household. Finally, individuals with higher wealth are more likely to receive remittances. Higher wealth makes it easier for an individual to migrate due to the monetary costs tied with migration as such individuals belonging from a wealthier household are more likely to have a migrant family member sending remittances.[13]

5.2 Remittances and labor disincentive effect

In our second step we estimate the role labor disincentive effect plays in being inactive in the labor force, while accounting for self selection and endogeneity. Table 9 presents the results for impact of remittances on labor disincentive effect using the approach defined by Wooldridge (2010) and an OLS estimation for comparison, complete estimation table is given in Appendix Table A-4. The results indicate that remittance receiving individuals are 37 percentage points less likely to be inactive due labor disincentive effect as compared to their counterparts the non remittance receiving individuals. Our assumption was that the inactivity is due to either labor disincentive

[13] Complete first stage estimation table is presented in the appendix table A-3.1

effect or the labor substitution effect. We find that the reason for said inactivity is individuals being more likely to engage in non-wage household labor activities due to the absence of the remittance sending member from remittance receiving households rather than consuming additional leisure. While our sample correction coefficient "λ" is negative and significant implying that without the sample correction our estimates would have been upward bias. When we compare the results to a simple OLS estimation without accounting for selection and endogeneity, we find that remittances receiving individuals are 3.9 percentage points more likely to be inactive due to labor disincentive effect. Whereas 24 percentage points less likely to be inactive due to labor disincentive effect when compared to a 2SLS model without selection correction.

TABLE 9: IMPACT OF REMITTANCES ON LABOR DISINCENTIVE EFFECT

	Labor Disincentive effect		
	OLS	**2SLS without sample correction**	**2SLS with sample correction**
Remittances	0.039***	-0.240***	-0.365***
	(0.004)	(0.039)	(0.044)
$\boldsymbol{\lambda}$			-0.605***
			(0.022)

Standard errors in parentheses we use robust standard errors to account for heteroskedasticity
*** indicate significance at a 1% level, ** at a 5% level, * at a 10% level
Note: The complete estimation with control variables is given in the appendix table A-4

Other key findings are that on average married individuals are 4 percentage points less likely to be inactive due to labor disincentive effect in remittances receiving households. Males are 8 percentage points more likely to be inactive due to labor disincentive effect, this may be because of the cultural structure of Pakistan, where females are more active in household labor activities than males. Thus, when a migrant member leaves the household, the female member is more likely to take up their place in household labor activities. Individuals belonging from urban region are 9 percentage points more likely to be inactive due to labor disincentive effect,

individuals belonging from Urban region are usually have more resources available to them and have less household labor activities to deal with such as farmwork etc. Education wise individuals with some levels of education are 9 percentage points more likely to be inactive due to labor disincentive compared to individuals with no schooling. This makes sense as uneducated individuals due to lack of opportunities are more inclined to perform household labor activities such as farm work etc., whereas educated individuals are inactive as they seek leisure over working.

Overall, our study finds that when endogeneity and sample correction are accounted for remittances lead to lower likelihood of an individual being inactive in the labor market, whereas without accounting for endogeneity one would conclude that remittances cause more probability of an individual being inactive in the labor force. Secondly, we examined the reason behind the inactivity from labor market by remittance receiving individuals, popular literature (Rodriguez and Tiongson, 2001; Azam and Gubert, 2006 and Kapur, 2005) point towards labor disincentive being the cause of labor market inactivity in remittance receiving households. We test this assumption empirically and find that remittance receiving individuals are less likely to be inactive due to the labor disincentive effect. We believe that labor substitution effect plays a greater role in said inactivity due to left behind members switching to household labor to fill the gap created by the migrant remittance sending family member.

Remittances can be considered as cash transfers without conditions. Studies by de Hoop et al. (2020) and Prifti et al. (2017) indicate that households receiving unconditional cash transfers tend to switch from off-farm paid work to own-farm labor and increase their use of hired agricultural labor. In our case, we observe a self-employment liquidity effect similar to the studies mentioned earlier, where households shift from wage labor to non-wage home labor to contribute

to family businesses or farm work. This leads to a labor substitution effect rather than a labor disincentive effect.

Chapter 6

Robustness checks

This section provides some additional analysis to check the robustness of the results. We proceed by discussing the main points that could challenge our findings. First, we test our model for all individuals above the age of 14 in the data, as currently we only worked with the working age population i.e., individuals between the ages of 15 to 64 years. Second, the use of linear probability model with binary dependent variables can pose problems in the form of Heteroscedasticity or predictive probabilities being potentially less than zero or greater than zero. As such we employ a bivariate probit estimation to test and see how our results fair in comparison. Third, we also use the bivariate probit model for all individuals above the age of 14 in the data similar to the first test and compare the results. Finally, we test our sample selection model with education qualification as a selection variable with the assumption that education qualification only impacts individuals choice to be active or inactive in the labor market but not the choice of being inactive due to labor disincentive effect or labor substitution effect.

6.1 Robustness check I: Using the entire sample of age 15 and above

The study makes use of working age population, defined to be between the ages of 15 – 64 years old, for our analysis. However, Pakistan labor laws state working age to be any individual above the age of 14 years, as such we test our model for individuals with all ages above 14 years old without restricting the upper bound to 64 years old. Table 10 shows that results are still robust, we

find the impact of remittances on labor market inactivity and labor disincentive effect to still be significant and showcase a relationship in a similar direction. We find that remittances receiving individuals are now 20 percentage points less likely to be inactive in the labor market as compared to 15 percentage points less likely to when using the working age population. Similarly, remittance receiving individuals are now 30 percentage points less likely to be inactive due to labor disincentive effect as compared to the previous 37 percentage points less likelihood.

TABLE 10: ROBUSTNESS CHECK I: USING THE ENTIRE SAMPLE OF AGE 15 AND ABOVE

	(1) Inactivity	(2) Labor Disincentive effect
Remittances	-0.206***	-0.297***
	(0.041)	(0.036)

Standard errors in parentheses. We use robust standard errors to account for heteroskedasticity.
*** indicate significance at a 1% level, ** at a 5% level, * at a 10% level
The complete estimation with control variables is given in the appendix table A-5

6.2 Robustness check II & III: Impact of remittances on being inactive using a different model

Another concern is that our model may not be suitable in estimating the impact of remittances on labor market inactivity due to the binary nature of our variables. As such we test our results using a bivariate probit regression that takes into account the binary nature of the variables and compare the results. We use a simple bivariate probit model with the following equations:

$$Inactive_i = \alpha + \beta_1 Remittances_i + \beta_2 Controls_i + \varepsilon_{i1} \quad (16)$$

$$Remittances_i = \delta_0 + \delta_1 Controls_i + \delta_2 Z_i + \varepsilon_{i2} \quad (17)$$

Inactive is the observed binary outcome, taking the value one if an individual is inactive in the labor market and zero otherwise. Remittances is the observed binary variable, taking the value one if an individual is receiving remittances from abroad, higher inactivity among remittances

receiving individuals would imply a significant positive sign of the coefficient β_1. The variable controls are used to account for the observable heterogeneity among the individuals and households. The variable "Z_i" are the instruments used to account for the endogenous nature of remittances. We use the same instruments as used in our original estimation using 2SLS, i.e, male share of adults in the household and married share of adults in the household.

The correlation between being inactive from the labor market and receiving remittances is given by $\rho = \text{Cov}(\varepsilon_1, \varepsilon_2)$, where the error terms ε_1 and ε_2 are assumed to be bivariate normally distributed. We can test for the endogeneity of remittances in the model by $H_0 = \rho = 0$. If the value of ρ is not statistically different from 0, then we can simply use a standard probit model to estimate equation 16. We find that ρ is statistically significant as such we have to use the bivariate probit model.

Table 11 presents the results using a bivariate probit model. We find that our results showcase similar relationship as a 2SLS model, remittances receiving individuals are now 5 percentage points less likely to be inactive in the labor market at 10% significant level. Thus, even when using a different model the relationship between labor market inactivity and remittances remains the same, as in both cases remittances lead to less likelihood of being inactive in the labor market.

TABLE 11: ROBUSTNESS CHECK II: IMPACT OF REMITTANCES ON BEING INACTIVE USING DIFFERENT MODEL

	Inactive	
	Bivariate probit Margins	**2SLS**
Remittances	-0.052**	-0.149***
	(0.024)	(0.042)

Standard errors in parentheses. We use robust standard errors to account for heteroskedasticity
*** indicate significance at a 1% level, ** at a 5% level, * at a 10% level
Wald test of rho=0: chi2(1) = 22.3561 Prob > chi2 = 0.0000
The complete estimation with control variables is given in the appendix table A-6

Table 12 presents the same test using the age sample of age 15 and above. We again find that our estimates are robust as both the models still showcase similar effects of remittances on Inactivity. However, the variable remittances is no longer significant.

TABLE 12: ROBUSTNESS CHECK III: IMPACT OF REMITTANCES ON INACTIVITY USING DIFFERENT MODEL FOR AGE 15 YEARS AND ABOVE

	Inactive	
	Bivariate probit Margins	**2SLS**
Remittances	-0.031	-0.206***
	(0.022)	(0.039)

Standard errors in parentheses. We use robust standard errors to account for heteroskedasticity
*** indicate significance at a 1% level, ** at a 5% level, * at a 10% level
Wald test of rho=0: chi2(1) = 17.2342 Prob > chi2 = 0.0000

The complete estimation with control variables is given in the appendix A-7

6.3 Robustness check IV: Using education qualification as a selection variable

Finally, we test the model with education qualification as a selection variable for our estimation of labor disincentive effect using the method defined in section "4.3 2-Stages least squares (2SLS) with sample selection". We assume that education impacts the decision of an individual to be inactive or active in the labor market, however it has no direct impact on the individuals decision to be inactive due to labor disincentive effect or labor substitution effect. Table 13 showcases the results as compared to the 2SLS without education qualification as a selection variable. We find that the results are almost identical with remittances leading to 35.2 percentage points less likelihood of being inactive due to labor disincentive effect when education is used as a selection variable as compared to the 36.5 percentage points less likelihood of being inactive due to labor disincentive effect when education is not used as a selection variable. λ is significant in both cases

showcasing that sample correction has taken place (-55.1 percentage points vs -60.5 percentage points).

TABLE 13: ROBUSTNESS CHECK IV: USING EDUCATION QUALIFICATION AS A SELECTION VARIABLE

	Labor Disincentive effect	
	2SLS with sample correction with education qualification as a selection variable	**2SLS with sample correction without education qualification as a selection variable**
Remittances	-0.352***	-0.365***
	(0.044)	(0.044)
λ	-0.551***	-0.605***
	(0.012)	(0.022)

Standard errors in parentheses. We use robust standard errors to account for heteroskedasticity
*** indicate significance at a 1% level, ** at a 5% level, * at a 10% level
The complete estimation given in appendix table A-8

It must be noted that education qualification is found to be highly significant when added as a control variable for labor disincentive effect. Thus, indicating it is a weak selection variable. However, as λ is still significant, we believe education qualification showcases sample correction at some level.

Conclusion

The thesis analysed the impact of remittances on labor market. We set out to examine the common finding of labor market inactivity being more prominent among remittance receiving individuals and further analyse the potential reason behind said inactivity, while accounting for endogeneity and self selection issues. Our results showcase that remittance receiving individuals are less likely to be inactive in the labor market. We believe this is due to the monetary costs associated with migration abroad in terms of travel and housing expense etc., so in the short term the non migrant family members tend to increase their labor supply in order to fund these costs. These results differ from earlier studies of Funkhouser (1995), Rodriguez and Tiongson (2001) that suffered from endogeneity issues. However, we find similar results to these studies when not accounting for endogeneity.

Secondly, we empirically examine whether the labor disincentive effect plays a role in remittances receiving individuals being inactive, as hinted towards by studies from Acosta (2006), Rodriguez and Tiongson (2001). We assume that inactivity is primarily due to either individuals opting for leisure over work or having to engage in non-wage household labor. We find that remittances receiving individuals are less likely to be inactive due to labor disincentive effect but rather due to labor substitution effect. This means that due to the absence of the remittance sending family member, the remaining members start to engage in household labor in his stead rather than seeking leisure. This may necessarily not be as harmful or not at all for the growth of the economy as compared to the inactivity resulting from labor disincentive effect.

Remittances play an important role in the economy of a developing nation, they can either help in its growth or hinder it. While the positive effects include increased income, consumption,

and investment, that ultimately lead to its growth. The negative effects can be detrimental as well, such as creating a dependence on remittances or resulting in lower labor supply. We believe by showing that in the case of Pakistan remittances not only decrease the likelihood of being inactive in the labor force but also that the reason behind such inactivity is not due to leisure seeking, policy makers can make better informed decisions regarding regulation of inward foreign remittances and labor supply.

However, more research is needed to scrutinise our findings and interpretations. In particular it could be beneficial to conduct a similar analysis using panel data. That could help to understand the short- and long-term impact of remittances on labor supply. Unfortunately, we could not use panel data due to its unavailability in Pakistan.

Finally, it is important to keep in mind the research limitations when studying the impact of remittances on labor market and economies. Most studies focus on specific economics at a particular point in time. However, due to cultural differences and national idiosyncrasies, the empirical evidence may not generalize to other economies and countries. Additionally, researchers over the years have applied many different methodologies to try and understand the impact of remittances on labor market, as such these differences contribute towards the diversity of findings. Especially due to the challenges posed by the endogeneity concerns surrounding remittances.

References

Acosta, P. (2011). School attendance, child labour, and remittances from international migration in El Salvador. *Journal of Development Studies*, *47*(6), 913–936.

Adams, R.H. (2005). Remittances, Poverty, and Investment in Guatemala. In: Özden, Ç., Schiff, M. (Eds.*). International Migration, Remittances, and the Brain Drain.* Washington D.C.: World Bank/Palgrave Macmillan

Akram, A., Chowdhury, S., & Mobarak, A. M. (2017). Effects of Emigration on Rural Labor Markets. *NBER Working Paper No. W23929*.

Ardington, C., Case, A., & Hosegood, V. (2009). Labor Supply Responses to Large Social Transfers: Longitudinal Evidence from South Africa. *American Economic Journal: Applied Economics, 1(1),* 22–48.

Asad, M., Hashmi, S. H., & Yousaf, S. (2016). Nexus between workers' remittances, unemployment, labor migration and economic growth in Pakistan. *International Journal of Organizational Leadership*, *5*, 360–379.

Azam, J.-P., & Gubert, F. (2006). Migrants' Remittances and the Household in Africa: A Review of Evidence. *Journal of African Economies*, *15*, 426–462.

Banerjee, A. V., Hanna, R., Kreindler, G. E., & Olken, B. A. (2017). Debunking the Stereotype of the Lazy Welfare Recipient: Evidence from Cash Transfer Programs. *The World Bank Research Observer, 32(2),* 155–184.

Bertrand, M., Mullainathan, S., & Miller, D. (2003). Public Policy and Extended Families: Evidence from Pensions in South Africa. *The World Bank Economic Review, 17(1),* 27–50.

Bianchi, M., & Bobba, M. (2013). Liquidity, Risk, and Occupational Choices. *The Review of Economic Studies, 80(2),* 491–511.

Boyd, M. (1989). Family and Personal Networks in International Migration: Recent Developments and New Agendas. *The International Migration Review, 23(3),* 638–670.

Cahuc, P., & Zylberberg, A. (2004). The Neoclassical Theory of Labor Supply. In *Labor Economics* (pp. 3–57). MIT Press.

Chiquiar, D., & Hanson, G. H. (2005). International Migration, Self-Selection, and the Distribution of Wages: Evidence from Mexico and the United States. *Journal of Political Economy, 113*(2), 239–281.

de Hoop, J., Groppo, V., & Handa, S. (2020). Cash Transfers, Microentrepreneurial Activity, and Child Work: Evidence from Malawi and Zambia. *The World Bank Economic Review, 34(3),* 670–697.

Funkhouser, E. (1995). Remittances from International Migration: A Comparison of El Salvador and Nicaragua. *The Review of Economics and Statistics, 77*(1), 137–146.

Franklin, S. (2015). Location, search costs and youth unemployment: A randomized trial of transport subsidies in Ethiopia. *University of Oxford.*

Gentilini, U., Honorati, M., & Yemtsov, R. (2014). The state of social safety nets 2014. *Washington, D.C.: World Bank Group.*

Gertler, P. J., Martinez, S. W., & Codina, M. R. (2012). Investing Cash Transfers to Raise Long-Term Living Standards. *American Economic Journal: Applied Economics, 4(1),* 164–192.

Görlich, D., Mahmoud, T. O., & Trebesch, C. (2007). Explaining Labour Market Inactivity in Migrant-Sending Families: Housework, Hammock, or Higher Education. *Kiel Working Paper No. 1391.*

Hanson, G. H. (2005). Emigration, Remittances, and Labor Force Participation in Mexico. *University of California, San Diego and National Bureau of Economic Research*.

Hanson, G. H., & Woodruff, C. (2003). Emigration and Educational Attainment in Mexico.

Heckman, J. J. (1979). Sample Selection Bias as a Specification Error. *Econometrica, 47(1),* 153–161.

Hildebrandt, N., McKenzie. (2005). The Effects of Migration on Child Health in Mexico. *Latin American and Caribbean Economic Association (LACEA), Vol. 6, No. 1 (Fall, 2005),* 257–289.

Kapur, D., 2005. Remittances: The New Development Mantra? In: Maimbo, S.M.; Ratha, D. (Eds), *Remittances: Development Impact and Future Prospects*. Washington, DC: The World Bank.

Mansuri, G. (2006). Migration, School Attainment and Child Labor: Evidence from Rural Pakistan. *Research Working Paper; No. 3945. World Bank, Washington, DC. © World Bank.*

Mishra, P. (2007). Emigration and wages in source countries: Evidence from Mexico. *Journal of Development Economics, 82(1),* 180–199.

McKenzie, D., & Rapoport, H. (2006). Can Migration Reduce Educational Attainment? Evidence from Mexico. *Policy Research Working Paper Series 3952, The World Bank*.

McKenzie, D., & Sasin, M. J. (2007). Migration, Remittances, Poverty, and Human Capital: Conceptual and Empirical Challenges. *Policy Research Working Paper Series 4272, The World Bank.*

Munshi, K. (2003). Networks in the Modern Economy: Mexican Migrants in the U. S. Labor Market. *The Quarterly Journal of Economics, 118(2),* 549–599.

Murard, E. (2020). On the Joint Consumption and Labour Supply Effects of Migration on those Left Behind. *The Journal of Development Studies, 56*, 129–150.

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

Pozo, S., & Amuedo-Dorantes, C. (2006). Migration, Remittances, and Male and Female Employment Patterns. *American Economic Review*, *96*, 222–226.

Prifti, E., Estruch, E., Daidone, S., Davis, B., Ufford, P. V., Michelo, S., Handa, S., Seidenfeld, D., & Tembo, G. (2017). Learning About Labour Impacts of Cash Transfers in Zambia. *Journal of African Economies, 26(4)*, 433–442.

Ranchhod, V. (2006). The Effect of The South African Old Age Pension on Labour Supply of the Elderly. *South African Journal of Economics, 74(4)*, 725–744.r

Rodriguez, E. R., & Tiongson, E. R. (2001). Temporary Migration Overseas and Household Labor Supply: Evidence from Urban Philippines. *The International Migration Review*, *35*(3), 709–725.

Rosenzweig, M. (1980). Neoclassical Theory and the Optimizing Peasant: An Econometric Analysis of Market Family Labor Supply in a Developing Country. *The Quarterly Journal of Economics*, *94*(1), 31–55.

Schultz, P. (1990). Women's Changing Participation in the Labor Force: A World Perspective. *Economic Development and Cultural Change*, *38*(3), 457–488.

Winters, P., de Janvry, A., & Sadoulet, E. (2001). Family and Community Networks in Mexico-U.S. Migration. *Journal of Human Resources, 36(1)*, 159–184.

Woodruff, C., & Zenteno, R. (2007). Migration networks and microenterprises in Mexico. *Journal of Development Economics, 82*(2), 509–528.

Wooldridge, J. M. (2010). Econometric Analysis of Cross Section and Panel Data (2nd Edition). *MIT Press*.

Yang, D. (2008). International Migration, Remittances and Household Investment: Evidence from Philippine Migrants' Exchange Rate Shocks. *The Economic Journal, 118(528)*, 591–630.

Appendix

Table A-1: Descriptive statistics of independent variables

Variables	Definition	Mean			
		(1)	(2)	(3)	(2) – (3)
		Full Sample	Remittances	Non-Remittances	Difference in Means
Remittances	Dummy variable: 1 = Receives remittances from abroad; 0 = Doesn't receive remittances from abroad	0.07	-	-	-
Married	Dummy variable: 1 = Ever been married; 0 = Never married	0.67	0.64	0.67	-0.03***
Male	Dummy variable: 1 = Male; 0 = Female	0.49	0.38	0.49	-0.11***
Age	Age in years	32.72	32.45	32.74	-0.29***
Age squared/100	Age squared divided by 100	12.53	12.54	12.53	0.01***
Urban	Dummy variable: 1 = Lives in urban area; 0 = lives in rural area	0.37	0.33	0.38	-0.05***
Education:	Categorical variable				
Never attended school	Dummy variable: 1 = Never went to school	0.44	0.34	0.45	-0.11***
Attended school in the past	Dummy variable: 2 = Attended school in the past	0.46	0.52	0.46	0.06***
Currently attending	Dummy variable: 3 = Currently attending	0.10	0.14	0.10	0.04***

Provinces:	Categorical variable				
KPK	Dummy variable: 1 = Belongs from state KPK	0.20	0.47	0.18	0.29***
Punjab	Dummy variable: 1 = Belongs from state Punjab	0.44	0.49	0.43	0.06***
Sindh	Dummy variable: 1 = Belongs from state Sindh	0.25	0.03	0.27	-0.24***
Baluchistan	Dummy variable: 1 = Belongs from state Baluchistan	0.11	0.01	0.12	-0.11***
Head of household	Dummy variable: 1 = Head of household; 0 = Not the head of household	0.25	0.21	0.25	-0.04***
Male population of household	Share of adult male in a household	0.30	0.24	0.30	-0.06
N		89,263	6,608	82,655	

Note: Shows the summary statistics for the sample.

Table A-2: Distribution of variables in amounts

Variables	Definition	Mean		
		Full Sample	Remittances	Non-Remittances
Remittances	Yearly remittances amount received	27975.79	377,906	0.00
Married	Dummy variable: 1 = Ever been married; 0 = Never married	59,974	4,240	55,734
Male	Dummy variable: 1 = Male; 0 = Female	43,402	2,495	40,907
Age	Age in years	32.72	32.45	32.74
Age squared/100	Age squared divided by 100	12.53	12.53	12.53
Urban	Dummy variable: 1 = Lives in urban area; 0 = lives in rural area	33,337	2,173	31,164
Education:	Categorical variable			
Never attended school	Dummy variable: 1 = Never went to school	39,066	2,277	36,839
Attended school in the past	Dummy variable: 2 = Attended school in the past	41,248	3,448	37,800
Currently attending	Dummy variable: 3 = Currently attending	8,949	933	8,016
Provinces:	Categorical variable			
KPK	Dummy variable: 1 = Belongs from state KPK	17,669	3,122	14,547
Punjab	Dummy variable: 1 = Belongs from state Punjab	39,171	3,229	35,942
Sindh	Dummy variable: 1 = Belongs from state Sindh	22,441	185	22,256
Baluchistan	Dummy variable: 1 = Belongs from state Baluchistan	9,982	72	9,910

Head of household	Dummy variable: 1 = Head of household; 0 = Not the head of household	22,213	1,406	20,807
Property value	value of property owned by household	2,739,023	4,128,135	2,617,686
household total income	household total income in a year	506,906.4	788,030.5	484,309.5
N		89,263	6,608	82,655

Note: Shows the summary statistics for the sample

Table A-3: Effect of remittances on the probability of being inactive

VARIABLES	OLS	2SLS
Remittances	0.064***	-0.149***
	(0.005)	(0.042)
married	0.035***	0.034***
	(0.005)	(0.005)
male	-0.487***	-0.498***
	(0.004)	(0.004)
age	-0.026***	-0.026***
	(0.001)	(0.001)
agesq1/100	0.034***	0.035***
	(0.001)	(0.001)
urban	-0.026***	-0.034***
	(0.001)	(0.003)
i. Provinces		
KPK	-	-
Punjab	-0.034***	-0.051***
	(0.003)	(0.005)
Sindh	-0.045***	-0.075***
	(0.004)	(0.007)
Baluchistan	0.012***	-0.019**
	(0.005)	(0.008)
i. Education qualification		
Never attended School	-	-
Attended school in the past	-0.026***	-0.025***
	(0.003)	(0.003)
Currently attending school	0.314***	0.314***
	(0.006)	(0.006)
Household head	-0.273***	-0.263***
	(0.004)	(0.005)
Ln total income	0.002	0.022***
	(0.002)	(0.001)
Ln property	0.021***	0.017***
	(0.001)	(0.004)
migrant network *share of male adults		
migrant network *share of married adults		
Constant	0.973***	0.817***
	(0.029)	(0.043)
Observations	77,703	77,703
R-squared	0.507	0.494

Standard errors in parentheses. We use robust standard errors to account for heteroskedasticity
*** p<0.01, ** p<0.05, * p<0.1

Table A-3.1 : 2SLS estimates of impact of remittances on the probability of being inactive

VARIABLES	First Stage	Second Stage
Remittances	-	-0.149***
	-	(0.042)
married	-0.036***	0.034***
	(0.004)	(0.004)
male	-0.033***	-0.498***
	(0.003)	(0.004)
age	-0.002***	-0.026***
	(0.001)	(0.008)
agesq1/100	0.003***	0.035***
	(0.001)	(0.001)
urban	-0.033***	-0.034***
	(0.002)	(0.003)
i. Provinces		
KPK	-	-
Punjab	-0.088***	-0.051***
	(0.003)	(0.005)
Sindh	-0.154***	-0.075***
	(0.003)	(0.007)
Baluchistan	-0.188***	-0.019**
	(0.004)	(0.008)
i. Education qualification		
Never attended School	-	-
Attended school in the past	0.008***	-0.025***
	(0.002)	(0.003)
Currently attending school	-0.008*	0.314***
	(0. 004)	(0.006)
Household head	0.027***	-0.263***
	(0.003)	(0.005)
Ln total income	0.006***	0.022***
	(0. 001)	(0.001)
Ln property	0.074***	0.017***
	(0. 009)	(0.004)
Instruments		
migrant network *share of male adults	-9.589***	
	(0. 332)	
migrant network *share of married adults	0.106***	
	(0.006)	
Constant	-0.777***	0.817***
	(0. 024)	(0.043)
Observations	77,703	77,703
R-squared	0.108	0.494

Standard errors in parentheses. We use robust standard errors to account for heteroskedasticity
*** p<0.01, ** p<0.05, * p<0.1

Table A-4: Impact of remittances on Labor Disincentive

VARIABLES	Labor Disincentive effect		
	OLS	2SLS without sample correction	2SLS with sample correction
Remittances	0.039***	-0.240***	-0.365***
	(0.004)	(0.038)	(0.043)
married	0.010**	0.010*	-0.037***
	(0.006)	(0.005)	(0.006)
male	-0.327***	-0.338***	0.079***
	(0.005)	(0.005)	(0.013)
age	-0.011***	-0.011***	0.013***
	(0.001)	(0.001)	(0.001)
Agesq/100	0.0162***	0.016***	-0.016***
	(0.001)	(0.001)	(0.002)
urban	0.082***	0.070***	0.091***
	(0.003)	(0.003)	(0.003)
i. Provinces			
KPK	-	-	-
Punjab	-0.081***	-0.106***	-0.074***
	(0.004)	(0.005)	(0.005)
Sindh	-0.052***	-0.096***	-0.054***
	(0.005)	(0.008)	(0.007)
Baluchistan	0.014***	-0.032***	-0.053***
	(0.005)	(0.008)	(0.009)
i. Education qualification			
Never attended school			
Attended school in the past	0.063***	0.068***	0.099***
	(0.004)	(0.004)	(0.004)
Currently attending school	0.311***	0.312***	0.041***
	(0.006)	(0.006)	(0.011)
Household head	0.214***	0.260***	0.598***
	(0.005)	(0.009)	(0.019)
Ln total income	-0.017***	0.004	0.008**
	(0.002)	(0.004)	(0.0041)
Ln property	0.024***	0.026***	0.005***
	(0.002)	(0.002)	(0.002)
λ			-0.605***
			(0.022)
Constant	0.881***	0.639***	0.642***
	(0.033)	(0.046)	(0.047)
Observations	46,438	46,438	46,438

R-squared	0.192	0.144	0.144

Standard errors in parentheses. We use robust standard errors to account for heteroskedasticity
*** p<0.01, ** p<0.05, * p<0.1

Table A-5 : Robustness check I: Using the entire sample of Age 15 and above

VARIABLES	(1) Inactive	(2) Labor Disincentive effect
Remittances	-0.206***	-0.297***
	(0.041)	(0.036)
married	0.016***	-0.019***
	(0.004)	(0.005)
male	-0.484***	-0.004
	(0.004)	(0.008)
age	-0.019***	0.006***
	(0.000)	(0.001)
Agesq/100	0.025***	-0.005***
	(0.001)	(0.001)
urban	-0.032***	0.080***
	(0.003)	(0.003)
i. Province		
KPK	-	-
Punjab	-0.058***	-0.071***
	(0.005)	(0.004)
Sindh	-0.082***	-0.058***
	(0.007)	(0.006)
Baluchistan	-0.026***	-0.046***
	(0.008)	(0.008)
i. Education qualification		
Never attended school	-	-
Attended school in the past	-0.025***	0.086***
	(0.003)	(0.004)
Currently attending	0.324***	0.092***
	(0.005)	(0.008)
Household head	-0.245***	0.452***
	(0.005)	(0.012)
Ln total income	0.021***	0.004
	(0.004)	(0.004)
Ln property	0.023***	0.008***
	(0.001)	(0.002)
λ		-0.477***
		(0.015)
Constant	0.638***	0.738***
	(0.041)	(0.039)
Observations	83,477	51,015
R-squared	0.469	0.154

Standard errors in parentheses. We use robust standard errors to account for heteroskedasticity
*** p<0.01, ** p<0.05, * p<0.1

Table A-6: Robustness check II Impact of remittances on labor market inactivity using a bivariate probit estimation

VARIABLES	Bivariate probit Margins	2SLS
Remittances	-0.051**	-0.149***
	(0.023)	(0.042)
married	0.019***	0.034***
	(0.004)	(0.005)
male	-0.355***	-0.498***
	(0.003)	(0.004)
age	-0.026***	-0.026***
	(0.001)	(0.001)
agesq1/100	0.036***	0.035***
	(0.009)	(0.001)
urban	-0.029***	-0.0341***
	(0.003)	(0.003)
i. Provinces		
KPK	-	-
Punjab	-0.039***	-0.051***
	(0.004)	(0.005)
Sindh	-0.061***	-0.075***
	(0.005)	(0.007)
Baluchistan	-0.001	-0.019**
	(0.005)	(0.008)
i. Education qualification		
Never attended School	-	-
Attended school in the past	-0.019***	-0.025***
	(0.003)	(0.003)
Currently attending school	0.269***	0.314***
	(0.005)	(0.006)
Household head	-0.197***	-0.263***
	(0.004)	(0.005)
Ln total income	0.0154***	0.022***
	(0.003)	(0.001)
Ln property	0.022***	0.017***
	(0.001)	(0.004)
Instruments		
migrant network *share of male adults		
migrant network *share of married adults		
Constant		0.817***
		(0.0431)
Observations	77,703	77,703
R-squared		0.494

Standard errors in parentheses. Robust standard errors used. *** p<0.01, ** p<0.05, * p<0.1

Wald test of rho=0: chi2(1) = 22.3561 Prob > chi2 = 0.0000

Table A-7: Robustness check III: Impact of remittances on labor market inactivity using a bivariate probit estimation and the entire sample of Age 15 and above

VARIABLES	(1) Bivariate probit Margins	(2) 2SLS
Remittances	-0.0306	-0.206***
	(0.022)	(0.041)
married	0.011***	0.016***
	(0.004)	(0.004)
male	-0.351***	-0.484***
	(0.002)	(0.004)
age	-0.022***	-0.019***
	(0.000)	(0.001)
Agesq/100	0.029***	0.025***
	(0.001)	(0.001)
urban	-0.024***	-0.031***
	(0.003)	(0.003)
i. Province		
KPK	-	-
Punjab	-0.040***	-0.058***
	(0.004)	(0.005)
Sindh	-0.056***	-0.083***
	(0.005)	(0.007)
Baluchistan	0.005	-0.026***
	(0.005)	(0.008)
i. Education qualification		
Never attended school		
Attended school in the past	-0.019***	-0.025***
	(0.003)	(0.003)
Currently attending	0.269***	0.324***
	(0.005)	(0.006)
Household head	-0.191***	-0.245***
	(0.004)	(0.005)
Ln total income	0.014***	0.021***
	(0.003)	(0.004)
Ln property	0.022***	0.023***
	(0.001)	(0.001)
Instruments		
migrant network *share of male adults	-	
migrant network *share of married adults	-	
Constant		0.638***
		(0.041)
Observations	83,477	83,477
R-squared		0.469

Standard errors in parentheses, Robust standard errors used. *** p<0.01, ** p<0.05, * p<0.1
Wald test of rho=0: chi2(1) = 17.2342 Prob > chi2 = 0.000

Table A-8: Robustness check IV: Using education qualification as a selection variable

VARIABLES	2SLS with sample correction with education qualification as a selection variable Labor Disincentive effect	2SLS with sample correction without education qualification as a selection variable Labor Disincentive
remittances	-0.352***	-0.365***
	(0.042)	(0.043)
married	-0.037***	-0.037***
	(0.005)	(0.006)
male	0.056***	0.079***
	(0.006)	(0.013)
age	0.011***	0.013***
	(0.001)	(0.001)
agesq1/100	-0.014***	-0.016***
	(0.001)	(0.002)
urban	0.100***	0.091***
	(0.003)	(0.003)
Province		
KPK	-	-
Punjab	-0.056***	-0.074***
	(0.005)	(0.005)
Sindh	-0.048***	-0.054***
	(0.007)	(0.007)
Baluchistan	-0.055***	-0.053***
	(0.009)	(0.009)
Education		
Never attended school	-	-
Attended school in past		0.099***
		(0.004)
Currently attending		0.041***
		(0.011)
Household head	0.583***	0.598***
	(0.015)	(0.019)
Ln total income	0.017***	0.008**
	(0.004)	(0.004)
Ln property	0.012***	0.005***
	(0.002)	(0.002)
λ	-0.551***	-0.605***
	(0.012)	(0.022)
Constant	0.489***	0.642***
	(0.050)	(0.047)
Observations	46,438	46,438
R-squared	0.138	0.144

Standard errors in parentheses. Robust standard errors used. *** p<0.01, ** p<0.05, * p<0.1