Are Remittances in the Hands of Women more Effective?
Evidence from Vietnam[1]

Sa Bui
University of Houston

Adriana Kugler
Georgetown University, NBER, and IZA

Abstract

In this project, we examine the impact of remittances on households' investments and consumption in Vietnam using the Living Standards Surveys. Given that households likely face budget constraints in Vietnam, one may expect for remittances to affect the decisions of households to invest and consume. In addition, since the unitarian model of the household is particularly unlikely to represent households in developing countries, we also look at differential impacts when a larger fraction of the remittances are received by women. We use an instrumental variables strategy to address the fact that households receiving different amounts of remittances and sending different amounts of remittances to women are likely to differ in terms of their observable and unobservable characteristics that correlate with investments and spending. We instrument the amount of remittances and the share of remittances going to women with the average distance between the household and the remitters and with the interaction between distance and the share of women in the household. OLS results show that remittances are associated with better health of young, adult and older individuals and with greater overall consumption, while the fraction of remittances received by women is associated with greater educational attainment and attendance, less child labor, and better health of elders while changing the composition of consumption expenditures from all categories towards health expenditures. However, when we use an IV strategy, we only find that remittances increase food and non-food expenditures and improve children's health. More importantly, the fraction of remittances received by women has a positive effect on attendance and a negative effect on child labor. The results thus show not only the amount of remittances but also the identity of the receiver matters in terms of increasing human capital investments for children.

I. Introduction

International migration more than doubled in the past four decades, reaching 190 million in the late 2000s. Close to half of all international migrants come from the developing world and more than half of them are women, with 65% of all international migrants living in high income countries.

Not surprisingly, international migration has been accompanied by a sharp rise in remittances, i.e., monetary transfers from migrants, back to their home countries. By 1997, international financial flows from remittances had surpassed overseas development assistance and by 2008 they were estimated to have reached 300 billion. The evidence on the impact that remittances in terms of improving the lives of those left behind shows mostly positive effects. Some studies find that remittances contribute to the development of regions and household in the sending countries by improving health outcomes and increasing investment in education and capital (e.g., Cox and Ureta (2001), Yang (2008), Lopez-Cordova (2005), Gibson and McKenzie (2010)). However, a number of studies find negative impacts from the migration of household members on those remaining behind. For example, Gibson, McKenzie and Stillman (2011) find that those left behind in the Pacific Islands are generally worse after the migration of other household members and McKenzie and Rapoport (2010) find that migration by household members in Mexico reduces educational attainment and attendance.

In this paper we examine the impact of remittances on investments and the composition of spending in Vietnam and ask whether the impact of remittances depends on the gender of the person who receives the monetary transfer from the migrant. Under the unitarian model of the household, household expenditure allocations should be independent of whether the money is controlled by a man or woman in the household. On the other hand, if household decisions

deviate from the unitary household model, then increases in the control of monetary resources within the household, say from increased remittances, will strengthen an individual's bargaining power and will change the allocation of expenditures. There is evidence from a number of countries that increased resources controlled by women at the time of marriage increases expenditure shares for education and health care (e.g., Quisumbing and Maluccio (2000), Thomas (1994), Hallman (2000) and Duflo (2003)). Here we ask whether increased control of remittances by women changes the allocation of expenditures and decisions within the household.

We use the Living Standards Measurement Surveys for Vietnam for 1992 and 1997 to examine the differential impact of remittances on household members when remittances are controlled by women. The empirical challenge to estimating the effects of remittances on households' outcomes comes from the fact that remittances and the fraction of remittances going to women may be endogenous. To address potential biases in the effects of remittances, we follow an instrumental variables strategy. Our instruments are the average distance of the remitters to the household and the interaction between the average distance and the share of women in the household. Given that we control for the region of residence of the household and the region of destination of the remitters, our identification assumption is that distance between the remitters and the household affects the amounts sent back home but is uncorrelated to investments conditional on residence and destination. Similarly, the assumption is the more represented women are in the household when remitters are far away, the more likely the remittances are to go to women in the household. OLS results shows that the amount of remittances is associated with improved health, less adult employment, more household expenditures in all categories, and increased business equipment. In addition, OLS results show

that a greater fraction of remittances going to women, the greater educational attainment of children in the household, the healthier the elderly in the household, the less investment in businesses, and the higher the spending in health. However, our instrumental variables results show more limited effects. 2SLS results only show a positive effect of remittances on children's health and increases in food and non-food expenditures. Moreover, an increase in the share of remittances going to women increases school attendance and, at the same time, reduces child labor.

Our results, thus, suggest that not only do the amount of remittances affect investments, but that the gender of the receiver is also important in terms of how remittances affect households. The fact that whether the remittances are received by a woman or a man matters in terms of household decisions is inconsistent with unitary models of the household. To our knowledge, only two studies have examined the differential remittances by gender. Guzman, Morrison and Sjoblom (2008) report results from simple OLS regressions and find that remittances going to female-headed household increase expenditures in health and education in Ghana. Gobel (2011) finds that female-headed households that receive remittances spend more on education and health and less on investment using household data from Ecuador. However, unlike our analysis, these studies only look at spending and do not examine other outcomes such as actual investments in human capital and equipment or on labor market outcomes.

II. Related Literature

The literature examining the impact of remittances has evolved from aggregate studies towards studies based on household and individual data. Adams and Page (2005) estimate the impact of remittances on poverty. Using data from 71 developing countries, they find that a rise

in remittances reduces the share of those living in poverty, where remittances are instrumented with the distance from the remittance-sending area. Lopez-Cordova (2005) conducts a regional study for Mexico using the interaction between distance to the U.S. and historical migration as an instrument and finds that an increase in the fraction of households receiving remittances in a municipality reduces infant mortality and child illiteracy and increases school attendance.

More recent studies have relied on individual-level data. A study by Cox-Edwards and Ureta (2003) uses the 1997 Annual household Survey from El Salvador to examine the impact of remittances on school attainment and controls for an indicator of whether the household received a remittance as a way to proxy for omitted variables. While the way to deal with omitted variable bias is not totally convincing, the study finds that the probability of leaving school is lower when remittances increase. Acosta (2006) also uses data from El Salvador but instead uses matching techniques and finds that children in remittance receiving households have higher school attendance and lower employment than those in non-receiving households. Hanson and Woodruff (2003) and Borraz (2005) both use the 2000 Mexican Census and use the interaction between the state migration rate and household characteristics and between the state migration rate and distance to the U.S. Hanson and Woodruff (2003) find that remittances increase schooling overall, but Borraz (2005) finds that remittances only help to increase schooling in rural areas. Using GMM, Acosta et al. (2008) examine the impact of remittances using household data from 10 Latin American countries and find that remittances have negative but small effects on inequality and poverty. Finally, a study by Yang (2003) for the Philippines uses exchange rate shocks during the period of the Asian crisis and finds that an increase in remittances raises school-related and investment-related expenditures and raises children's schooling and increases the likelihood that a household enters an entrepreneurial activity. A

recent paper by Gibson and McKenzie (2010) instead relies on matched difference-in-differences and finds that remittances from migrants to New Zealand increased income and consumption of more durable goods as well as child schooling in Tonga. However, another study looking at Pacific islanders by Gibson, McKenzie and Stillman (2011) finds that the absence of individuals allowed to migrate to New Zealand on the basis of a lottery has mostly negative impacts on those household members left behind. Similarly, McKenzie and Rapoport (2010) find lower schooling for young individuals in households with migrants in Mexico.

While the most reliable studies based on instrumental variables and matched difference-in-difference methods find positive effects of remittances on health, schooling and investments, none of these studies examines the differential impact of remittances going to women and men. A growing literature tests the unitary household model, i.e. testing whether household acts as one rational decision maker, in the context of developing countries. There is evidence that money in the hands of women has different effect on the outcomes of households' members compared to money in the hands of men. A number of studies find that unearned income in the hands of mothers increases education and health of children. Quisumbing and Maluccio (2003) find that women's assets at the time of marriage increase expenditure shares in education in Bangladesh and South Africa. Thomas (1990) finds that unearned income in the hands of mothers improves health of all children in Brazil, but Thomas (1994) finds that mothers' education has greater effects on daughters' height and fathers' education has a greater effect in sons' heights in Brazil and Ghana. Similarly, Hallman (2000) also finds that mothers' assets reduce daughters' morbidity while assets of fathers improve sons' health in Bangladesh. Duflo (2003) also documents gender asymmetries and finds that cash transfers to women have a positive impact on girls' BMI and height for age measures but not on boys.

While many studies have shown evidence against the unitarian model of the household in developing world few studies have examined the differential impact of remittances on households when these are received by women. Only Guzman, Morrison and Sjoblom (2008) and Gobel (2011) have examined the differential effects of remittances when received by a female vs. a male-headed household. Both of these studies look only at expenditures and find that remittances received by female-headed households raise the share of expenditures in health and education in Ghana and Ecuador. While Gobel tries to instrument for the amount of remittances, Guzman, Morrison and Sjoblom's (2008) data from Ghana does not allow them to use either matching or instrumental variables to deal with the endogeneity of remittances.

Here, we explore whether the effects of remittances differ with the gender of the receiver of the remittances in Vietnam. Contrary to the two previous studies that have looked at this question, we not only examine the impact on household expenditures but we also examine impacts on schooling, health, and labor market and investment outcomes. In addition, we address the endogeneity of remittances by providing instruments for both the amount of remittances as well as the share of remittances going to women.

III. Data

We use data from the Vietnamese Living Standards Surveys (VLSS) for the years 1992 and 1997. The first VLSS was conducted between September 1992 and October 1993 by the Vietnamese Ministry of Planning and Investment along with the General Statistical Office (GSO). The second survey was conducted between December 1997 and December 1998 by GSO. These surveys were part of the Living Standards Measurement Study (LSMS) household surveys conducted in various developing countries, with technical assistance from the World

Bank. The surveys include information on the communities and the households. In our analysis, we focus on the household questionnaires which collect information on demographic information characteristics, educational attainment, anthropometric measures, labor market activities, and place of residence. Most importantly, the surveys include detailed questions on the total amount of remittances from different sources, as well as the identity and location of the sender of the remittances and the identity of the receiver of the remittances. The surveys contain information about the remitter and receiver of remittances. The data collector was asked first to list the names of the remitters, then correspondingly ask to write the down the ID code of the family member that received the money from each remitter.

The 1992 sample includes 4800 households and the 1997 sample includes the original 4800 households and an additional 1200 households, which were selected from the total sample of the 1995 Multi-Purpose Household Survey of the GSO. Since survey questions changed from one year to the next, we constructed variables so that they would be the same in the two surveys. Specifically, our education variables are the variable on the number of years of school a person has and whether the person still attends school. Our labor market outcomes include variable whether the person was employed in the past 12 months and monthly salary of the job worked in the past 12 months. Our health variable is the person's BMI. Expenditures and total remittances a household received in the past 12 months are expressed in thousand VN Dongs. We transform these into real Dongs by deflating these with the 1997 regional CPIs.

Table 1 provides descriptive statistics of the variables for the various age sub-samples we consider in our analysis: young, adults, and older individuals. Individuals in remittance-receiving households in all age groups have more educated parents, are more likely to live in urban areas, have higher schooling and attendance themselves, and are taller and heavier than those not

receiving remittances. Of course, these differences should not be interpreted as causal. In fact, differences in parental schooling and urbanization may indicate self-selection into migration and remittance receipt and highlight the importance of controlling for these variables. Table 1 also shows that remittance-receiving households spend more and have higher profits and higher value in their non-farm equipment, even though these households are on average smaller.

IV. Empirical Framework

Remittances as extra income would relax liquidity constraints, allowing households to smooth consumption and invest in schooling, health and businesses. At the same time, having family members working elsewhere may disrupt family life that may bring about negative effect to outcomes of individual members and of households. For example, the absence of the mother or father may disrupt a child's school. Or the absence of the mother or father may also put pressure on the children to leave school and to earn money when there are no remittances. It is important to note, however, that in our 1992 and 1996 surveys, less than 4% and less than 2% of the remitters are wives/husbands of the receivers, while more than 37% and 48% of the remitters are children of the receivers.

The basic regression describing relationship between total household remittances and individual outcomes is

$$Y_{ij} = \beta R_j + \rho S_j + \Psi X_{ij} + \Omega Z_j + \varepsilon_{ij},$$

(1)

where Y_{ij} is the outcome of interest of individual i in household j. R_j is the total amount of remittances received by household j, and S_j is share of remittances going to women in the household. Vector X_{ij} contains the individual characteristics such as age and sex and the mother's

and father's number of years of schooling. Vector Z_j contains household characteristics, which includes whether the household is in urban or rural area, whether the household is female-headed, size of the household, year and location effects, and region of destination of the remitter. We also estimate similar regressions for the household outcomes, but which do not control for individual characteristics.

The regressions above will provide us with relationships between total household remittances and the share of remittances received by women and the outcomes of interest, but the estimate on remittances will not be causal. In particular, households receiving remittances may also be more likely to send children to school, to spend more money on healthcare and to invest in businesses. That is, observable and unobservable factors related with the receipt of remittances may also correlate with the outcomes of interest, which would bias the effects of remittances. We control for factors such as the location of residence, whether the household lives in an urban or rural area and the educational attainment of the mother and the father. However, unobservable factors such as motivation and drive may also be related to both the amount of remittances and investments. Likewise, the fraction of the remittances received by women in the household may be related to other factors. If the bargaining power of women in the household determines what fraction of the remittances women get, then this would capture exactly what we are interested in and there would be no bias. However, if other factors are determining the fraction going to women and are also related to outcomes, then we would be getting biased results of these effects as well.

To establish a causal relationship between total household remittances and outcomes of interest, we rely on instrumental variables. We argue that conditional on observable household characteristics and most importantly on location of the recipient and the remitters, distance

between the recipient and the remitters will affect the outcomes only through the amount of remittances sent. While the location of the recipient may certainly be correlated with the outcomes of interest, for example if there are more schools or hospitals in the area, we are controlling for location fixed effects in our regressions. Moreover, the destination of the remitter may be correlated with unobservable factors that may also be correlated with their families' outcomes, for example if migrants going to Europe, the U.S. or migrating internally are different. For this reason, we control for the region of the destination of the remitters. Conditional on region of receiver and remitters, however, distance should only affect the outcomes of interest because it affects the amount of remittances sent. We construct the average distance from the household to all remitters within a household, Avg_dis, to instrument for the total amount of remittances. From the surveys, we have the location of the households by the name of the province. We also know the location of the remitters by the name of the province/country. Using Google Earth, we obtain latitude-longitude coordinates of the capital of the province/country and use the following distance formula to calculate the distance between the receiving household j and each remitter k:

$$\text{Distance}_{jk} = 6,371\text{km}\times\text{acos}(\sin(\text{lat1})\times\sin(\text{lat2}) + \cos(\text{lat1})\times\cos(\text{lat2})\times\cos(\text{lon1-lon2}),$$

(3)

where 6,371 corresponds to the earth's radius measured in kilometers, and so the distances are also measured in kilometers. If the sender is in the same province of the household then the distance is zero. For remittance senders whose location is "other", we impute the average distance from all remitters whose locations are outside of Vietnam and whose receiving households are from the same province. We do this for 11 out of 1639 senders in the 1992 VLSS

and 29 out of 2750 senders in the 1997 VLSS. We, then, average over all remitters in the household, so that   .

In addition, the share of remittances received by women may also be endogenous, so we use the interaction between the average distance between the household and the remitters and the share of women in the household. The idea is that if there are more women in the household, remittances may just have to go to them. Thus, to identify parameters, β and ρ in equation (1), we use the average distance and the average distance interacted with the share of women in the household as the instrumental variables. Our first-stage regressions are thus:

$$R_j = \pi_0 \text{Avg\_Dis} + \pi_1 \text{Avg\_Dist} \times \text{Share\_Women} + \varsigma Z_j + \nu_j$$

$$S_j = \delta_0 \text{Avg\_Dis} + \delta_1 \text{Avg\_Dist} \times \text{Share\_Women} + \Lambda Z_j + \eta_j.$$

(4)

Then, we estimate the following 2SLS regression:

$$Y_{ij} = \phi \hat{R}_j + \theta \hat{S}_j + \Phi X_{ij} + \Delta Z_j + e_{ij},$$

where $\hat{R}$ and $\hat{S}$ are the predicted values from equation (4).

V. Results

Tables 2-6 provide OLS estimates of the impacts of remittances on various individual and household outcomes. Table 2 reports the regressions on educational outcomes, limiting to the sample of young people. Interesting total remittances have not associated with years of education or with attendance. When we control for the fraction of total household remittances received by women, we see that the fraction is positively correlated with the number of years of schooling and with school attendance. An increase of 50% in the fraction of women receiving remittances is associated with about half an extra year of schooling and 0.07 higher probability of attending

school. Table 3 reports OLS estimates body-mass index of young, adult and elderly members of the household on total remittances and the share of remittances going to women. Interestingly, an increase in total remittances is associated with a higher BMI, but the share of remittances received by women is only associated with the BMI of older members of the household.

Table 4 reports the relationship between total household remittances and employment of household members. For young people, there is a positive but very weak relationship between total household remittances and the event that young people were employed in the past 12 months but a negative and weak association with monthly salaries in that job. An increase in remittances by 100,000 VN Dongs increases the likelihood of employment by 0.0006 and wages by 0.0867. On the other hand, an increase in the fraction of remittances received by females by 50% is associated with a lower probability of child labor of 0.08. For the adults, total household remittances have a negative correlation with being employed in the past 12 months. Moreover, a higher fraction of total household remittances going to women is negatively related with being employed but positively associated with monthly salaries.

Regarding OLS estimates of the impact of remittances on household outcomes, table 5 reports the estimates on household expenditure while table 6 reports the estimates on household non-farm enterprises. Total household remittances have a positive correlation with household expenditures in education, health, food and non-food items. An increase in 1,000 VN Dongs in household remittances are associated with higher expenditures of between 10 to 70 VN Dongs. On the other hand, the fraction of household remittances received by women is associated with higher household health expenditures but with lower food expenditures. Moreover, while total household remittances have no association with profit from non-farm businesses, they have a positive association with the value of business equipment. On the other hand, the fraction of

household remittances received by women is negative associated with both business profits and the value of business equipment.

However, we know that the results in Tables 2-6 are correlations and are likely to be biased. Table 7 provides the first-stage result of total remittances and the share of remittances going to women on distance and the interaction of distance with the share of women in the household. Columns (1) and (2) show the regressions of total household remittances on the average distance and the interaction of distance with the share of women, and column (3) shows the results of the share of women receiving remittances on distance and the interaction where the interaction term is key to instrument for the share of remittance recipients who are women. The first-stage regression for total remittances shows that an increase of 650 km., i.e., the median distance, increases remittances by 440,000 VN Dong or about a 20% increase in the average total remittances received in the sample. Thus, as remitters go farther away from the household they send more in remittances, most likely because it becomes harder to travel and they compensate their family members by sending them money. We also find that as the households with a greater fraction of women have relatives move farther away, the share of women receiving remittances increases. The relationships between the endogenous variables and the instruments are highly significant.

Tables 8 and 9 provide IV estimates of the effects of total remittances on individual and household outcomes. Once we instrument for total remittances and for the share received by women, we find some evidence that remittances increase human capital investments but the effects are much more limited. We only find that the fraction of remittances received by women has a positive effect on attendance. A 20% increase in the share of total remittances going to women increases school attendance by 0.08 or 10% of the mean attendance in Vietnam. The IV

estimate is bigger than the OLS estimate, suggesting that the OLS estimates were downwardly biased and that if anything those household where women receive a greater share of remittances also do worse in terms of schooling and other outcomes. In accordance with greater attendance of children in households where women are recipients of remittances, we find that higher shares of remittances controlled by women reduce child labor. In particular, we find that an increase in the share of remittances going to women of 20%, holding total remittances constant, reduces the likelihood of child employment by 0.12, which is sizable reduction of about a third relative to the mean employment of young people in the sample. We also find that while an increase in total remittances improves BMI for children and adults in those households, the effects are very small. As before the IV estimates are bigger than the OLS estimates, and they suggest that a rise in remittances of 1 million VN Dong increases BMI by between 0.03 and 0.08. While adult employment falls and salaries increase in response to an increase in total remittances, labor market participation does not respond to women's control of remittance monies. While the IV estimates are also bigger than the OLS estimates, these effects are still very small.

Table 9 shows the impact of remittances on expenditures and business profits and equipment. Interestingly, while women's control of remittances increases schooling and reduces child labor, the share of remittances received by women is not associated with increased expenditures in education, with increased expenditures in other items, or with business investments. Higher remittances, however, is associated with increases in education, health, food and non-food expenditures. However, the increase in remittances must partly be going into savings as an increase in remittances is not associated with a 1 to 1 increase in total expenditures.

In summary the IV results show that while total remittances are associated with better health, lower adult employment, higher salaries for those employed and increased consumption,

these effects tend to be small. By contrast, the results show that increasing women's control of remittance funds substantially increases school attendance and reduces child labor. Thus, control of monetary transfers from migrants by women is key in terms of increasing investments in education more than the actual amount remitted. The quantity of remittances, on the other hand, does seem to have positive, albeit small, effects on health improvements and consumption in the households.

V. Conclusion

We use the Vietnamese Living Standards Surveys for 1992 and 1997 to examine whether women's control of remittances changes household investments and consumption patterns. Unlike the scarce literature that has tested the unitary model of the household exploiting financial resources coming from women, we use instrumental variable techniques to eliminate potential biases due to the endogeneity of total remittances and of the share of remittances received by women. Our IV results are bigger than the OLS results suggesting that those receiving more remittances overall and those that send more money to women in the households are less inclined to invest and spend. We find that increasing overall remittances has positive effects in terms of improving health, reducing adult employment and improving the quality of employment, and increasing household consumption. However, these effects are all small.

More importantly, our results show that increased control of remittances by women increases child attendance and reduces child labor, but has no effect on educational expenditures. This result suggest that when women are given greater bargaining power they will sway decisions towards keeping children in school rather than sending them to work. Increasing the share of remittances going to women to 50% would raise school attendance by 25% and reduce

child labor by a substantial 90%. Increasing women's decision-making within the household is thus key in terms of raising human capital for children.

References

Acosta, Pablo. 2006. "Labor Supply, School Attendance, and Remittances from International Migration: the Case of El Salvador," World Bank Policy Research Working Paper No. 3903.

Acosta, Pablo, Cesar Calderon, Pablo Fajnzylber and Humberto Lopez. 2008. "What is the Impact of International Remittances on Poverty and Inequality in Latin America," *World Development*, 36(1): 89-114.

Adams and Page. 2005. "Do International Migration and Remittances Reduce Poverty in Developing Countries?" *World Development*, 33(10): 1645-1669.

Amuedo-Dorantes, Catalina and Susan Pozo. 2009. "New Evidence on the Role of Remittances on Health Care Expenditures by Mexican households," IZA Working Paper No. 4617.

Borraz, Fernando. 2005. "Assessing the Impact of Remittances on Schooling: The Mexican Experience," *Berkeley Electronic Press*.

Cox-Edwards, Alejandra and Manuelita Ureta. 2003. "International Migration, Remittances and Schooling: Evidence from El Salvador," *Journal of Development Economics*, 72(2): 429-461.

Duflo, Esther. "Grandmothers and Granddaughters: Old Age Pension on Child and Intra-Household Allocation in South Africa," *World Bank Economic Review*, 17(1) 2003: 1-25.

Guzman, Juan Carlos, Andrew Morrison and Mirja Sjoblom. 2008. "The Impact of Remittances and Gender on Household Expenditure Patterns: Evidence from Ghana," in eds., Andrew Morrison, Maurice Schiff and Mirja Sjoblom, *The International Migration of Women*, pp. 125-152, World Bank and Palgrave McMillan.

Hallman, Kelly. 2000. "Mother-Father Resource Control, Marriage Payments, and Girl-Boy Health in Rural Bangladesh," FCND Discussion Paper No. 93.

Hanson, Gordon and Christopher Woodruff. 2003. "Emigration and Educational Attainment in Mexico," Mimeo, University of San Diego.

Lopez-Cordova. 2005. "Globalization, Migration and Development: The Role of Mexican Migrant Remittances," *Economia*, 6(1): 217-256.

Lundberg, Shelly, Robert Pollak, and Terence Wales. "Do Husbands and Wives Pool Their Resources? Evidence from the United Kingdom Child Benefit," *Journal of Human Resource*, 32(3): 463-480.

McKenzie, David and John Gibson. 2010. "The Development Impact of a Best Practice Seasonal Worker Policy," World Bank Policy Research Working Paper No. 5488.

McKenzie, David, John Gibson and Steven Stillman. 2011. The Impacts of International Migration on Remaining Household members: Omnibus Results from a Migration Lottery Program," forthcoming *Review of Economics and Statistics*.

McKenzie, David, John Gibson and Steven Stillman. 2010. "How Important is Selection? Experimental Versus Non-experimental Measures of the Income gains from Migration," *Journal of the European Economic Association*, 8(4): 913-945.

McKenzie, David and Hillel Rapoport. 2010. Can Migration Reduce Educational Attainment? Evidence from Mexico," *Journal of Population Economics*, 1-28.

Quisubing, Agnes and John Maluccio. 2003. "Resources at Marriage and Intrahousehold Allocation: Evidence from Bangladesh, Ethiopia, Indonesia and South Africa," *Oxford Bulletin of Economics and Statistics*, 65(3): 283-327.

Thomas, Duncan. 1994. "Like Father, Like son; Like Mother Like Daughter: Parental Resources and Child Height," *Journal of Human Resources*, 29(4): 950-988.

Thomas, Duncan. 1990. "Intra-household Resource Allocation: an Inferential Approach," *Journal of Human Resources*, 25(4): 635-664.

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

	Youngs (age>=5 & age <18)		Adults (18<=age<=65)		Elders (age > 65)	
Table 1: Basic Descriptive Statistics of Remittance-Receiving and Non-Receiving Households						
	Remittance-Receiving Households	Non-Receiving Households	Remittance-Receiving Households	Non-Receiving Households	Remittance-Receiving Households	Non-Receiving Households
Individual-level Variables						
Female	0.496	0.489	0.552	0.522	0.584	0.584
	(0.500)	(0.500)	(0.497)	(0.500)	(0.493)	(0.493)
Age	11.007	11.058	36.898	35.936	73.312	73.137
	(3.699)	(3.676)	(13.634)	(12.917)	(5.947)	(6.072)
Individual Total of Remittances	737.400	0.000	3345.092	0.000	2803.255	0.000
	(1679.702)	(0.000)	(10422.340)	(0.000)	(6869.880)	(0.000)
Number Years of Schooling of Father	8.600	6.461	4.857	3.655	1.631	1.173
	(3.825)	(4.221)	(4.023)	(3.505)	(2.809)	(2.285)
Number of Years of Schooling of Mother	6.060	4.712	2.200	1.647	0.225	0.201
	(3.593)	(3.930)	(2.847)	(2.431)	(0.868)	(0.838)
Currently Attending School	0.789	0.723	0.038	0.027	0.000	0.000
	(0.408)	(0.447)	(0.192)	(0.163)	(0.000)	(0.000)
Number of Years of Schooling	4.156	3.716	7.690	6.664	2.843	2.199
	(3.295)	(3.054)	(4.060)	(3.900)	(3.463)	(2.941)
Employed in the Past 12 Months	0.281	0.365	0.848	0.919	0.388	0.371
	(0.450)	(0.481)	(0.359)	(0.272)	(0.488)	(0.483)
Monthly Salary of the Job Worked in the Past 12 Months (zero if self-employed)	19.945	12.509	109.858	64.004	8.349	7.840
	(75.683)	(62.661)	(254.804)	(198.227)	(52.628)	(48.802)
Self-employed in the Past 12 months	0.164	0.126	0.114	0.105	0.167	0.106
	(0.371)	(0.332)	(0.317)	(0.306)	(0.373)	(0.309)
Arm Circumference (in cm)	18.474	18.203	24.777	24.576	23.301	22.644
	(3.299)	(3.258)	(2.701)	(2.456)	(3.080)	(2.820)

Height (in cm)	132.578	131.057	156.439	156.119	151.288	150.627
	(18.536)	(18.297)	(7.602)	(7.503)	(8.207)	(8.310)
Weight (in kg)	28.941	28.161	48.974	48.352	43.866	42.147
	(11.321)	(10.993)	(7.767)	(7.227)	(8.598)	(7.780)
BMI	15.723	15.674	19.971	19.798	19.122	18.511
	(2.319)	(2.257)	(2.561)	(2.337)	(3.042)	(2.577)
Having No Illness in the Past 4 Weeks	0.720	0.732	0.629	0.641	0.369	0.427
	(0.449)	(0.443)	(0.483)	(0.480)	(0.483)	(0.495)
Health Expenditure in the Past 12 Months	63.192	51.151	203.522	130.342	557.377	258.742
	(302.226)	(319.526)	(740.438)	(501.301)	(2666.309)	(629.333)
Household-level Variables						
Household Total of Remittances	3649.672	0.000	4013.502	0.000	3778.215	0.000
	(12502.890)	(0.000)	(11277.520)	(0.000)	(11437.580)	(0.000)
Remittances Received by Females	1797.731	0.000	2085.491	0.000	1618.293	0.000
	(6874.376)	(0.000)	(7504.010)	(0.000)	(5912.251)	(0.000)
Fraction of Remittances Received by Females	0.486	0.000	0.495	0.000	0.444	0.000
	(0.488)	(0.000)	(0.487)	(0.000)	(0.478)	(0.000)
Total of Non-farm's Businesses' Profit	4704.644	3836.364	5035.310	4394.176	3214.377	3280.654
	(14520.510)	(12023.750)	(13492.060)	(14376.920)	(10083.630)	(11953.540)
Total Value of Non-farm Businesses' Equipment	5090.858	4515.284	5238.605	5235.299	4218.543	4886.647
	(30420.730)	(29627.830)	(26749.750)	(38067.970)	(23607.610)	(47421.090)

Female-headed Household	0.307	0.164	0.336	0.219	0.333	0.236
	(0.461)	(0.370)	(0.472)	(0.413)	(0.471)	(0.425)
Urban	0.325	0.148	0.413	0.212	0.335	0.202
	(0.468)	(0.355)	(0.492)	(0.409)	(0.472)	(0.402)
Size of Household	5.847	6.151	5.239	5.629	4.066	5.427
	(2.039)	(2.028)	(2.280)	(2.250)	(2.396)	(2.444)
Agricultural Household	0.501	0.712	0.446	0.651	0.553	0.687
	(0.500)	(0.453)	(0.497)	(0.477)	(0.497)	(0.464)
Expenditure on Rice	2097.436	2367.335	1878.858	2203.641	1508.759	2115.871
	(1103.266)	(1206.447)	(1026.516)	(1221.347)	(1013.162)	(1234.237)
Expenditure on Food	6687.039	6097.592	6929.607	6255.066	5520.606	5854.732
	(4553.508)	(4008.458)	(5110.309)	(4360.741)	(4630.880)	(4443.504)
Expenditure on Non-food	7269.241	5085.989	8039.168	5585.701	6546.983	5144.164
	(8925.642)	(6305.671)	(9747.163)	(6862.889)	(10837.240)	(6772.139)
Expenditure on Health	866.123	554.927	941.761	602.178	1208.988	702.809
	(2220.095)	(1027.766)	(2416.955)	(1193.713)	(3723.668)	(1052.437)
Max N	3,155	13,689	6,108	21,265	1,267	1,748

NOTES: "Number of Year of Schooling" refers to the number of years of schooling the person completed. Monetary variables are in thousand VN Dongs and are inflated by regional indices. Standard errors are in parentheses.

Table 2: OLS Estimates of the Impacts of Remittances on Education				
	Years of Education		Attendance	
	(1)	(2)	(1)	(2)
Remit Total	4.87e-06	-1.25e-05	-2.85e-06	-5.91e-06***
	(8.23e-06)	(9.09e-06)	(2.07e-06)	(1.89e-06)
Fraction received by Female Members		0.844***		0.148**
		(0.285)		(0.0576)
N	327	327	327	327

Notes: Robust standard errors are clustered at household level when regressions are run at individual level and repoted in parentheses. All specifications contain age, sex, whether household is in an urban area, year and region fixed effects, household size, whether female heads the household. These regressions also contain father and mother's years of education. *** p<0.01, ** p<0.05, * p<0.1.

Table 3: OLS Estimates of the Impact of Remittances on Health						
		BMI				
		Youngs		Adults		Elders	
	(1)	(2)	(1)	(2)	(1)	(2)
Remit Total	4.49e-05***	4.50e-05**	1.08e-05**	1.10e-05**	5.06e-05***	4.78e-05***
	(1.63e-05)	(1.78e-05)	(4.55e-06)	(4.69e-06)	(1.31e-05)	(1.31e-05)
Fraction received by Female Members		-0.00421		-0.0230		0.314*
		(0.336)		(0.0626)		(0.170)
N	308	308	25,915	25,915	2,755	2,755

Notes: Robust standard errors are clustered at household level when regressions are run at individual level and repoted in parentheses. All specifications contain age, sex, whether household is in an urban area, year and region fixed effects, household size, whether female heads the household. *** p<0.01, ** p<0.05, * p<0.1

Table 4: OLS Estimates of the Impact of Remittances on Employment				
	A. Youngs			
	Employed in the Past 12 Months		Monthly Salary from job in the Past 12 Months	
	(1)	(2)	(1)	(2)
Remit Total	3.12e-06*	6.46e-06***	-0.00126**	-0.000867*
	(1.77e-06)	(1.95e-06)	(0.000585)	(0.000522)
Fraction received by Female Members		-0.161**		-21.16*
		(0.0753)		(11.10)
N	317	317	119	119
	B. Adults			
	(1)	(2)	(1)	(2)
Remit Total	-2.26e-06**	-1.95e-06**	0.000607	0.000452
	(9.99e-07)	(9.30e-07)	(0.000544)	(0.000505)
Fraction received by Female Members		-0.0338***		18.71***
		(0.00759)		(5.954)
N	27,373	27,373	24,689	24,698
	C. Elders			
	(1)	(2)	(1)	(2)
Remit Total	-2.37e-06*	-2.34e-06*	0.00121	0.00122
	(1.36e-06)	(1.36e-06)	(0.00141)	(0.00139)
Fraction received by Female Members		-0.00752		-0.0855
		(0.0247)		(4.348)
N	3,013	3,013	1,138	1,138

Notes: Robust standard errors are clustered at household level when regressions are run at individual level and repoted in parentheses. All specifications contain age, sex, whether household is in an urban area, year and region fixed effects, household size, whether female heads the household. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: OLS Estimates of the Impact of Remitances on Household Expenditures				
	Education Expenditure		Health Expenditure	
	(1)	(2)	(1)	(2)
Remit Total	0.0129**	0.0130**	0.0297**	0.0271**
	(0.00552)	(0.00565)	(0.0126)	(0.0122)
Fraction received by Female Members		-13.29		257.4***
		(41.30)		(82.56)
N	10,650	10,650	10,798	10,798
	Food Expenditure		Non-food Expenditure	
	(1)	(2)	(1)	(2)
Remit Total	0.0664***	0.0687***	0.249***	0.250***
	(0.0209)	(0.0221)	(0.0717)	(0.0739)
Fraction received by Female Members		-233.8**		-38.27
		(112.5)		(295.1)
N	10,798	10,798	10,798	10,798
Notes: Robust standard errors are clustered at household level when regressions are run at individual level and repoted in parentheses. All specifications contain age, sex, whether household is in an urban area, year and region fixed effects, household size, whether female heads the household. *** p<0.01, ** p<0.05, * p<0.1.				

Table 6: OLS Estimates of the Impact of Remitances on Household Enterpreneurial Activities				
	Business Profit		Value of Business Equipment	
	(1)	(2)	(1)	(2)
Remit Total	0.0442	0.0562	0.283**	0.303**
	(0.0380)	(0.0406)	(0.136)	(0.143)
Fraction received by Female Members		-1,202***		-2,020**
		(341.6)		(1,026)
N	10,795	10,795	10,337	10,337

Notes: Robust standard errors are clustered at household level when regressions are run at individual level and repoted in parentheses. All specifications contain age, sex, whether household is in an urban area, year and region fixed effects, household size, whether female heads the household. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: First-stage results			
	Households		
	(1)	(2)	(3)
Average Distance	0.681***	0.543***	9.45e-06**
	(0.0544)	(0.155)	(4.17e-06)
Average Distance X Fraction of Female in the Household		0.261	4.28e-05***
		(0.266)	(6.93e-06)
Max N.	10,797	10,797	10,797
F test	-	80.49	233.42
p-value	-	0.00	0.00

Notes: Robust standard errors are in parentheses. Regressions include all controls. Dependent Variable in specification 1, and 2 is Total remittances. Specification 3: Fraction of remittances received by female members. To F test gives the F-statistics of joint significance of IV variables. *** p<0.01, ** p<0.05, * p<0.1

Table 8: IV Estimates of the Effects of Rremittances on the Outcomes of Children and Adults						
	A. Youngs					
	Years of Education		Attendance		BMI	
	(1)	(2)	(1)	(2)	(1)	(2)
Remit Total	3.77e-05	-1.92e-05	1.19e-05	-2.08e-06	1.81e-05	7.95e-05**
	(5.47e-05)	(4.35e-05)	(1.14e-05)	(1.10e-05)	(4.47e-05)	(3.50e-05)
Fraction received by Female Members		1.454		0.358*		-1.448
		(1.130)		(0.185)		(1.204)
Max N.	327	327	327	327	308	308
	Employed in the Past 12 Months		Monthly Salary from Job in the Past 12 Months			
	(1)	(2)	(1)	(2)		
Remit Total	-5.76e-06	1.82e-05*	-0.00256	0.0123		
	(1.10e-05)	(1.01e-05)	(0.00209)	(0.0562)		
Fraction received by Female Members		-0.581***		-994.5		
		(0.186)		(4,208)		
Max N.	317	317	119	119		
	B. Adults					
	BMI		Employed in the Past 12 Months		Monthly Salary from Job in the Past 12 Months	
	(1)	(2)	(1)	(2)	(1)	(2)
Remit Total	2.86e-05***	6.33e-05	-4.89e-06***	-8.63e-06	0.00331**	-0.00205
	(1.09e-05)	(5.43e-05)	(1.28e-06)	(6.14e-06)	(0.00163)	(0.00624)
Fraction received by Female Members		-0.759		0.0813		106.4
		(1.154)		(0.129)		(120.6)
Max N.	25,915	25,915	27,373	27,373	24,698	24,698

Notes: Robust standard errors are in parentheses. In specification 1, average distance instruments for total remittances.In specification 2, average distance and average distance interact with fraction of female in the household are instruments for total remittances and fraction of remittances received by female households.*** p<0.01, ** p<0.05, * p<0.1.

Table 9: IV Estimates of the Effects of Remittances on the Households						
	Business Profit		Value of Business Equipment		Education Expenditure	
	(1)	(2)	(1)	(2)	(1)	(2)
Remit Total	0.131	0.922*	0.160	1.014	0.0429***	0.0907
	(0.0814)	(0.549)	(0.212)	(0.823)	(0.0111)	(0.0630)
Fraction received by Female Members		-16,809		-18,154		-1,013
		(10,829)		(15,183)		(1,248)
Max N.	10,793	10,793	10,335	10,335	10,648	10,648
	Health Expenditure		Food Expenditure		Non-food Expenditure	
	(1)	(2)	(1)	(2)	(1)	(2)
Remit Total	0.0324***	-0.0254	0.179***	0.410**	0.491***	0.752**
	(0.0122)	(0.115)	(0.0262)	(0.201)	(0.0574)	(0.340)
Fraction received by Female Members		1,229		-4,915		-5,546
		(2,573)		(4,017)		(6,672)
Max N.	10,796	10,796	10,796	10,796	10,796	10,796

Notes: Robust standard errors are in parentheses. In specification 1, average distance instruments for total remittances. In specification 2, average distance and average distance interact with fraction of female in the household are instruments for total remittances and fraction of remittances received by female households. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.