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Abstract

This paper studies the impact of remittances on the savings behaviour of rural households in China, using a cross-sectional survey. Allowing for endogeneity and left-censoring of remittances, we find that the marginal propensity to save out of remittances is well below half of that out of other sources of incomes. Moreover, we find no evidence of any direct effect of remittances on either capital input or gross output of farm production. These findings are in line with recent studies which conclude that remittances are largely used for consumption purposes by rural Chinese households and there is no link between migration and productive investment.

Keywords: rural-urban migration, remittances, savings, instrumental-variables estimation, quantile regression

JEL Classification: D12, O15, R23

1. Introduction

Much of the economic literature on migration has been focusing on labor market outcomes. However, recently economists have started to turn their attention to the role of migration and remittances on a number of other outcomes, including return migration and savings. For instance, Galor and Stark (1990) use the Overlapping Generations Model to show that the higher the probability of return migration from the host country the higher is the level of savings of immigrants. Kilic et al. (2007) present strong evidence that past migration experience exerts a positive impact on the probability of owning a non-farm business for Albanian households. By exploiting a natural experiment arising from a change in nationality law in Germany in 2000, Piracha and Zhu (2007) find that the easing of the requirements for naturalization has caused significant reductions of savings and remittances for immigrants in Germany as a whole.

It has been over 20 years since the massive rural-urban migration in China took off in the early 1980s. There are now signs that a small but growing stream of returnees who, often after extended episodes of circular and repeat migration, are planning to settle back in areas of their rural origins. As a result of low marginal product of labour arising from substantial labour surplus, many of these prospective returnees would prefer to start their own business upon return rather than going back to farming and settle in towns instead of villages, see for example Fan (2008). Meanwhile, both the central and local governments in China are also keen to promote return migration as part of their strategies to catalyze rural development and to address the serious imbalance in the social and economic development between the urban and the rural areas, see for example MOA (2001). However, the success of this strategy will critically depend on the rapid

accumulation of start-up capital. An optimistic view is that most of the capital will come from savings by migrants themselves, through remittances (for example Murphy 1999; Zhao 2002). However, recent empirical research on China has refuted this view, see for example de Brauw and Rozelle (2008) and de Brauw and Giles (2008).

Therefore a good understanding of the impact of migration and remittances on savings behaviour in the Chinese context is not only of academic interest, but also of paramount policy importance. This paper is based on a cross-sectional survey of some 1500 households from two Chinese provinces carried out by the Chinese Academy of Social Sciences (CASS) in 2006. Our main aim is to find out whether remittances are more likely to generate the much needed capital accumulation that might lead to sustainable growth and development in rural China than income from other sources. In particular, we want to separate out the causal effect of remittances on savings.

The paper is organised as follows: section 2 reviews the relevant literature before raising the research question for this paper; section 3 describes the dataset; section 4 presents the empirical model and discusses the key economic and econometric issues; section 5 presents empirical findings; and section 6 concludes.

2. Literature Review

There is a general consensus that rural-to-urban migration has played a vital role in China's phenomenal growth over the past three decades (see for example Knight and Song 2005; Naughton 2007; Fan 2008). It is now estimated that there are as many as 150 million rural-urban migrants within China, which is not far off the 200 million cross-

boarder migrants worldwide. Since the 1990s, migration has become the single most important contributor to growth of household income (de Brauw et al. 2002; NBS 2005). However, despite its apparent importance, there seems to be an acute gap in the understanding of internal migration in China, not least due to a lack of access to survey data.

Heavily influenced by the neo-classical economics of migration (NCEM) literature (see Todaro 1969; Harris and Todaro 1970), much of the empirical literature on internal migration in China is confined to the determinants of migration and stresses the 'push and pull' factors. It is widely accepted that the increased demand for labor in urban areas and the widening income differential between the urban and the rural sectors are the driving forces behind the recent massive internal migration in China (Yang 1999 and Zhao 1999; Zhang and Song 2003; Wu and Zhu 2004; Knight and Song 2005). One distinctive feature of the Chinese migration literature is its emphasis on the institutional settings which centre on the *hukou* (household registration) and the land tenure system. The former denies rural-urban migrants access to many types of jobs in the formal sector and entitlements to most social security benefits (see for example Aaberge and Zhu 2001; Fan 2008), while the latter rules out the sale of land and makes even subcontracting of land costly (NBS 2005). As a result, few of Chinese internal migrants can expect to settle in the host cities on a permanent basis.

Only a few studies have looked at the impact of migration and remittances on rural China. This strand of literature is often inspired by the New Economics of Labor Migration (NELM) literature which takes the household perspective and emphasises the role of social networks (see Mincer 1978; Katz and Stark 1986), in contrast to NCEM's

oversimplified assumption of maximization of individual earnings. For example, both Ravallion and Chen (2004) and Du et al. (2005) find a positive effect of migration on poverty reduction, although this effect appears to be limited as the poorest can't afford to migrate. Moreover, Giles (2006) and Giles and Yoo (2007) show that migration helps spread risk in rural China. More recently, Zhu and Luo (2008) suggest that migration not only leads to increases in rural income, but also tends to narrow income inequality.

The aim of this paper is to investigate the causal relationship between migration and savings in rural China. More specifically, our key research question is 'Do migrants really save more than non-migrants in rural China?'. Essentially, we will attempt to estimate whether or not the marginal savings from remittances, is equivalent to savings from other incomes sources for households in rural China.

To the best of our knowledge, there has been no study on the impact of remittances by rural-urban migrants on savings in China. Fortunately, we can draw on the wider literature on international migration to shed some light on this important issue.[1]

To the extent that a lack of start-up capital and technical know-how prevent the development of family-owned businesses, international migration possesses the potential to loosen credit constraints through remittances and human capital development (Kilic et al. 2007). Empirically, there appears to be near consensus on the positive relationship between return migration and non-farm self-employment, drawing on evidence from a number of origin countries, including Albania (Kilic et al. 2007), Egypt (McCormick and Wahba 2004), Turkey (Dustmann and Kirchkamp 2002) and Mexico (Mesnard 2004).

[1] Roberts (1997) shows that there are striking similarities between Chinese internal migration and undocumented Mexican migration to the US - in such key respects as the dominance of circular and repeat migration, large income differentials between sending and receiving areas, legal obstacles that prevent permanent settlements and surplus labour in agriculture.

However, due to its distinctive institutional settings, it is not clear if this positive relationship also applies to the context of rural-urban migration in China. Whether rural-urban migration is more conducive to self-employment through financial capital accumulation than other forms of employment in China is ultimately an empirical question and hence can only be answered using Chinese data.

There are two notable papers which present some indirect evidence on the likely effect of remittances on savings in China. Allowing for endogeneity, measurement errors and county fixed-effects, Zhu et al. (2009) present strong evidence that remittances are largely used for consumption purposes using a large sample of rural Chinese households in three representative provinces surveyed in 2001 and 2004. Given that remittances can only be used for consumption or saving purposes, this finding would imply that growing remittances are unlikely to boost savings by much. Using household data collected in rural China in 2000, de Brauw and Rozelle (2008) also fails to find any evidence of a link between migration and productive investment. More specifically, they suggest that migrants in poor areas use remittances to increase current consumption by and large, while there is some evidence that households in non-poor areas are slightly more likely to use remittances for consumptive investment (that is in housing and other consumer durables).

3. Data

The data for this study are derived from the New (Rural) Cooperative Medical System survey (NCMS) conducted by the Institute of Population and Labor Economics, Chinese Academy of Social Sciences and Nanjing Agricultural University in October 2006. The

sample consists of 998 households in Anhui province and 500 households in Jiangsu province, with about 50 households in each of the 30 sampled counties. Separate surveys were administered at the local health authorities in each of the counties. In both Anhui and Jiangsu, households are drawn from the sampling frame of the Rural Household Survey of the National Bureau of Statistics.[2] Although the main purpose of the NCMS survey was to evaluate the pilot of the new medical insurance scheme which is to be phased in nationwide by 2010, the data is sufficiently rich to enable us to study the impact of remittances on the savings behaviour of rural households.

< Table 1 here >

Table 1 describes the sample selection process. Of the 1,498 surveyed households, 13 are excluded for having non-permanent residents only (defined as living away from home for six months or more over the past 12 months) or a head of household with a non-local *hukou*. Another 58 households are dropped because they report a negative annual total net household income. To minimise the impact of outliers, we also drop households with net incomes in the top and bottom 2.5 per cent of the distribution from the remaining households in each province. Moreover, 13 households are excluded due to missing age, education of the head of household or cultivated land. That leaves us with 1,346 households in the working sample, with 447 from Jiangsu province and 899 from Anhui province respectively.

Despite bordering with each other, it turns out that there are remarkable differences across these two provinces. For instance, per capita rural net income of

[2] This implies that households who have migrated as a whole on a permanent basis are not included in the survey. NBS (2005, p75) documents that out of the 118.23 million rural-urban migrants, only 24.70 million, or 21%, migrated with all their family members according to the 2004 Rural Household Survey.

Jiangsu is twice as much as that of Anhui in 2005, at 5276 and 2641 yuan respectively (NBS 2006).[3] The national average for 2005 is 3255 yuan. Of particular concern is the inclusion of two counties in Jiangsu, namely Xishan County of Wuxi City and Wuzhong District of Suzhou City, both of which are at the heart of the Yangtze River Delta, which has been a magnet for migrants for the past two decades.[4] Given the focus of the paper is on the impact of out-migration and remittances, we decide to drop these two counties from our final working sample. That still leaves 352 households from Jiangsu province.

< Table 2 here >

Table 2 reports summary statistics of households with and without remittances, by province. While migrant households[5] account for only 30 per cent of households in Jiangsu province, they represent a far higher proportion, at 43 per cent in the neighbouring Anhui province. Zhu et al. (2009) suggest that the low share of migrant labour in Jiangsu can be attributed to a much higher share of non-migrant employment in the Township and Village Enterprises (TVEs) and other local government or non-government organizations.

There is considerable heterogeneity across the two provinces, as far as migration patterns are concerned. Mean annual total net household income for non-migrant households in Jiangsu is 21539 yuan, which is 16.3 per cent higher than that for their migrant counterparts. In contrast, non-migrant households in Anhui report a mean net

[3] Migrants are included in the denominator when calculating per capita rural net income, in so far as they are regarded as permanent members of the households who are surveyed at the source of migration. All travel costs and living expenses away from home by migrants have already been deducted before calculating remittances and net income (*chunshouru*), the latter being the most important measure of living standards for rural areas in Chinese government statistics.

[4] According to the 2000 census (NBS Online Statistics), the net inflows of migrants as a share of the population with local *hukou* are 19.5% and 16.9% for Xishan and Wuzhong respectively. Out of the one hundred sample households from these two counties, only one can be classified as a migrant household.

[5] Migrant households and households with remittances are used interchangeably in this paper.

household income of 13497 yuan, which is 6.7 per cent below that of migrant households in the province. However, in per capita terms, incomes for households without remittances are always higher, with a gap of 33.4 and 10.0 per cent for Jiangsu and Anhui respectively. Moreover, household wealth for non-migrant households, as proxied by the value of the house, is 50.2 and 16.4 per cent higher than migrant households in Jiangsu and Anhui respectively. This pattern seems to suggest that migration is associated with lower total net income and lower initial wealth.

As for most household surveys, savings are not directly measured in the NCMS. In this paper, we define savings as the difference between annual net household income (*chunshouru*) and annual household total living expenses. The former measure and its per capita counterpart are regarded as the best indicator of standard of living in Chinese government statistics. All travel costs and living expenses away from home by migrants have already been deducted before calculating remittances, net income, and total living expenses. Note that costs of building new houses are excluded from living expenses[6] and transfers to people (parents, children and relatives) outside the household are deducted from both total net income and total living expenses.

There appears to be no monotonous relationship between savings and migration status. While non-migrant households in Jiangsu save 25.0 per cent of their net incomes on average, the savings ratio for migrant households is just half as much, at 13.2 per cent. For Anhui province where migration is more widespread, savings ratio for migrant households is indeed almost four times as high as that for non-migrant households.

[6] The theoretical justification is that most of these expenditures should be regarded as investment rather than consumption. Moreover, the NCMS survey only asks the year (but not the month) of construction so it is difficult to assign housing costs into the right budget year. There were only 42 and 15 households which built new houses in 2005 and 2006 respectively in the data.

Per capita cultivated land is low in both provinces, implying very low marginal product of labor. In Anhui province, per capita land for migrant households is 13 per cent lower than that for non-migrant households. However, the opposite is true in Jiangsu. Table 2 also shows that in both provinces, heads of migrant households tend to be older and are less likely to be female, comparing to non-migrant households. Consistent with the pattern for financial capital proxied by house values, the distribution of human capital, as measured by the highest qualification of any member in the household, is also in favour of non-migrant households. For example, migrant households are less likely to contain anyone with an education above the compulsory junior high school level.

Recent literature has highlighted the role of human capital in decisions regarding migration and remittances (for example Du et al. 2005). Figures 1a and 1b show mean savings and total net incomes by the highest qualification of any member in the household, for non-migrant and migrant households separately. It is clear that net household incomes are by and large increasing in qualifications for both family types, although the education gradient appears to be steeper for non-migrants, at least up to the level of polytechnics, consistent with a comparative advantage in migration for the less educated.

< Figure 1a+1b here >

4. The Model

In this paper we model the impact of remittances and other net incomes on savings in rural China. More specifically, we assume that savings is determined by

$$s = \mathrm{f}(y, z) + \mathrm{W}\beta + \varepsilon \qquad (1)$$

where y and z are remittances and all other net income respectively (we suppress index for household for simplicity of notations), W is a vector of exogenous characteristics and ε captures the unobservable determinants of saving patterns. In our parametric analysis below, we further assume that f(y, z) is linear and additively separable. Figures 2a and 2b show a natural cubic spline in net household income to savings for non-migrant and migrant households separately. In both cases, the fitted smooth curves are very close to being linear, thus justifying the linearity assumption.

< Figure 2a+2b here >

Following earlier research by Kooreman (2000) and Edmonds (2002) which estimate simple specifications where expenditure on each good is assumed to be a linear function of Child Benefit (CB) and of total expenditure less CB, we test for differential marginal propensities to save (*mps*) out of the remittances and other sources of net income. Our objective is to test whether f(y, z) is simply additive. That is, we test if remittance has the same effects on savings as other sources of net income, or the income pooling hypothesis.

The econometric challenges to the estimation of equation (1) are three fold:

1) Measurement of remittances. The amount of money sent or taken home over the past year was asked of everyone who has any off-farm income in the NCMS survey. To distinguish between migrant and non-migrant off-farm income, we only treat money sent or taken home by someone who lives away from home for 6 months or more over the past year as remittances.[7] Then we aggregate over all household members to get total remittances for the household. Therefore

[7] This is also the definition of a migrant in the 2000 Census.

measurement error may arise from a combination of recall error and possible misallocation of remittances to a different budget year. It is also possible that a migrant-worker (who lives away from home for at least half of the year) might have some income from non-migrant work while a non-migrant might have income from temporary migration which lasted less than 6 months.

2) Endogeneity in remittances and other sources of income. In principle migration and remittances are jointly determined with savings, often as part of the household strategy to maximise net household income and to diversify risks (see the NELM literature).

3) Heterogeneity. There is considerable heterogeneity in saving patterns across provinces and across types of households.

The standard solution to the first two problems is the method of two-stage least square (2SLS) estimation. While we can not allow for fixed-effects with cross-sectional data, we will present estimations for Jiangsu and Anhui separately as well as together, and try to include as many control variables as possible to mitigate the heterogeneity problem. We will also run quantile regression to shed some light on the distributional effects of remittances on savings.

5. Empirical Results

5.1. Ordinary Least Squares (OLS) Estimation

Table 3 show the OLS estimation results which will serve as a benchmark against which other results are compared. Assuming there is no measurement error or

endogeneity, this naïve specification suggests that the *mps'* out remittances are higher than those out of other income sources for both provinces individually and pooled together. Indeed, the *mps*' are around 0.9 in all three models. With the exception of Jiangsu (with p=0.535), the income pooling hypothesis is clearly rejected. Most of the coefficients of the control variables seem to make sense.[8] For example, having any household member with a post-compulsory education or a head of household of higher social status (that is being a cadre or Chinese Communist Party member or having a non-agricultural *hukou*) is associated with higher permanent income (perhaps through access to the urban social security networks which are inaccessible to the vast majority of the rural population) and hence less need to save for precautionary reasons (see Giles and Yoo 2007), *ceteris paribus.*[9] A larger household is associated with higher autonomous consumption (pure subsistence need) and hence a lower level of savings, at given household incomes.

< Table 3 here >

The main story emerging from the OLS estimates is that rural households save a higher proportion of their remittances than of their other net income at the margin. This implies that at any given level of total net household income, household with a higher share of income from remittances save more.

[8] Our findings are robust with respect to the dropping of these demographic controls.
[9] It is also possible that real net income and hence real savings are under-reported for this group.

5.2. Two-Stage Least Square (2SLS) Estimation

Table 4a and 4b present the second-stage and the first-stage estimates of 2SLS estimation respectively.[10] Failing to reject exogeneity of other net income in a more general specification, we decide to treat it as exogenous and only allow remittances to be endogenous in our empirical specification.[11] The two instruments used are the proportion of county non-migrant labour force (18-50 year olds) ever migrated and whether the head of household has ever migrated. The former, which in essence measures the proportion of return migrants among current non-migrants, can be regarded as a proxy for social networks which is particularly important in the job search process[12] while the latter is expected to have a direct effect on the probability of migration in the survey year. Although the two instruments appear to be jointly significant and easily pass the IV relevance test (Anderson canonical LM test) in all three models, they turn out to be rather weak according to the Stock-Yogo test for weak instruments (Stock and Yogo 2005) for Jiangsu province.

< Table 4a+4b here >

While the IV estimates of the *mps* out of other net income are largely similar to their OLS counterparts, endogenising remittances certainly makes a significant difference for the estimate of the *mps* out of remittances. Indeed, the estimated *mps* out of remittances for Jiangsu is only 0.296, which is far below that out of other income and only one-third of its OLS counterpart in magnitude. For Anhui, the corresponding IV

[10] To save space, we only report the coefficients of the instrumental variables in the first-stage. A complete set of results are available from the authors upon request.

[11] This assumption is more reasonable than it appears given the low marginal product of labour in farming and the prevalence of seasonal migration which allows migrants to work on the farm during the busy seasons (see Zhu et al. 2008).

[12] Zhu et al. (2008) report that 66.4% of migrants get their jobs through personal contacts such as friends and relatives in 2004.

estimate is two-thirds the size of its OLS counterpart. However, due to the large standard error, we are actually unable to reject the income pooling hypothesis at the five per cent significance level in any of the three specifications. In contrast, the F-statistics for the joint significance are well above 10 for Anhui and for the pooled specification.[13] Moreover, the size of the IVs for Anhui as well as the pooled specification is close to 10 per cent even according to the Stock-Yogo test, implying that the maximal bias in IV is only about 10 per cent of that in the OLS.

The Sargan test for over-identification also confirms the exogeneity of the instruments. Thus, the 2SLS results suggest that once we account for measurement errors and endogeneity of remittances, migrants no longer save more than non-migrants at the margin in either province.

5.3. Tobit Two-Stage Estimation

There is one more problem we haven't addressed so far, namely that remittances are actually left-censored (that is we don't observe negative remittances in the data). In the following, we will estimate a Tobit two-stage model (see Maddala 1983) where remittances are predicted by a Tobit model in the first step. This approach provides for consistent estimates in the presence of a censored endogenous variable and has been popular in labour economics (see for example Jacobsen and Rayack 1996).

< Table 5a+5b here >

[13] An indicator for weak instruments in the case of a single endogenous regressor is F<10.

Table 5a and 5b show the second and first stage estimates of the Tobit two-step estimation respectively. The standard errors for the second-stage are bootstrapped with 1000 repetitions. Comparing to the 2SLS specification, we can see a more than tripling of the size of the negative impact of non-migrant income on remittances for Anhui, and an even bigger increase for Jiangsu. The excluded variables that were also used as instruments in the 2SLS model have by and large retained their statistical significance for both provinces.

The contrast with 2SLS in the second-stage results is quite striking. For Jiangsu, the *mps* out of remittances is only 0.096, about one-eighth of that out of other income. For Anhui, it is less than half the size of that for other income, at 0.355 as opposed to 0.813. A formal two-sided t-test would reject the equality of the *mps'* at the 5 per cent level of significance in all specifications. This implies that the OLS finding that migrants save more than non-migrants is driven by a combination of measurement error and endogeneity as well as misspecification of functional form, and hence spurious. Once we correct for all these problems, it turns out remittances have a far smaller impact on savings than income from other sources, dollar for dollar.

5.4. Quantile Regression

In this subsection, we go on to examine the relationship between savings and different sources of incomes in more detail to see if their effects differ *across* the savings distribution conditional on observable covariates – for example, it might be the case that the differences in the effect of remittances and other income on savings are larger for individuals who are likely to be towards of the top of the residual savings distribution

anyway (that is by virtue of their unobserved factors that contribute to savings – their attitudes toward risks, social skills, family background, etc.). This method is known as *quantile regression* (QR) and has become increasingly popular in the recent literature. This QR method works by weighting the observations unequally – giving more weight to observations closest to the percentile chosen for the analysis. Thus, if one is interested in knowing the effect of remittances on households who are towards the bottom of the conditional savings distribution it would be instructive to estimate a regression that is centered on the 10th percentile, say. The QR fitted line then passes through that percentile of the distribution.

< Table 6 here >

Table 6 reports quantile regression estimates, at the median and at the bottom and top 10^{th} and 30^{th} percentiles, for Jiangsu and Anhui separately using a specification otherwise equivalent to the OLS. In general the median regression estimates are quite close to those derived from OLS, especially for Anhui. However, two patterns are particularly worth noting. Firstly, at each quantile, *mps'* out of other net income are virtually the same across the two provinces. Secondly, while *mps'* out of remittances are by and large increasing in quantiles for Jiangsu province, they display a distinct U-shape for Anhui province, with a higher *mps* at both the top and the bottom of the distribution. This could be consistent with a strong target saving motive at the top and credit constraints at the bottom of the conditional savings distribution.

5.5. Remittances and Agricultural Productivity

Using a household survey with detailed information on the demographics, wealth, agricultural production and investment overtime, de Brauw and Rozelle (2008) conclude that there is no evidence of a link between migration and productive investment in rural China in the late 1990s. With our more recent data, it would be interesting to see whether that is still the case. However, being a single cross-section with no measure of wealth, our dataset is less than ideal for the purpose of replicating their study. Nevertheless, we are still able to look at the impact of remittances on agricultural productivity, following Rozelle et al. (1999).

To save space, we only present OLS and the second-stage of the 2SLS results for the pooled sample in Table 7. We look at both input and output measures of farm production. The measure for agricultural input takes account of all farm-related capital input which includes purchase of seeds, fertilisers, pesticide and fuel, wage cost of employing labor, as well as rental cost of land, machinery and livestock. The farm product is derived by aggregating over the (imputed) sales values of all grain and cash crops harvested over the past year. The control variables are similar to those in the savings equations but we now include per capita land.[14] Following Rozelle et al. (1999), we allow both remittances and number of migrants to be endogenous in the 2SLS estimation, using matched county-level statistics from the 2000 census data as instruments. More specifically, we instrument using share of *hukou* population migrating, share of labor force in the primary sector and infant (0-1 year olds) sex-ratio, all of which

[14] The drop in sample sizes is due to zero values of land sizes of 43 households. Note that land sizes are not included in the savings equations due to statistical insignificance.

are shown to increase both remittances and number of migrants. It is also worth noting that both 2SLS models have passed the IV relevance and exogeneity tests at the conventional level of significance.

< Table 7 here >

As might be expected, the number of migrants has a negative impact on both capital input and gross output of farm production. Sending out an additional migrant will reduce capital input by about 2100 yuan and gross farm product by about 3200 yuan, thus reducing total household net income by just 1100 yuan. However, this is just a small decrease in relation to mean total net income, well below 10% in relative terms, reflecting a very low marginal product of labor in rural China (recall that per capita cultivated land is only about 0.09 hectare in our sample). More importantly, controlling for number of migrants, we do not find any statistically significant impact of remittances on either capital input and gross output of farm production in either the OLS or the 2SLS specification. This result lends strong support to our main finding that remittances are not as important as other sources of income as far as savings are concerned. This result is thus also consistent with Zhu et al. (2009) which find that remittances are largely used for consumption purposes using a larger sample of rural Chinese households surveyed in 2001 and 2004.

6. Conclusions

This paper is based on a cross-sectional survey of some 1500 households from two Chinese provinces carried out by the Chinese Academy of Social Sciences in 2006.

We focus on the impact of remittances on the savings behaviour of rural households in China. A naive OLS specification suggests that the marginal propensity to save out of remittances is higher than that out of other sources of income, implying that migrants save more than non-migrants at any level of net household income. However, this result turns out to be spurious as it suffers from biases arising from endogeneity and measurement errors in remittances. An additional source of bias comes from functional form misspecification which fails to allow for left censoring of remittances. Once we correct for all these misspecifications, we find that the *mps* out of remittances could be less than half of that out of other sources of incomes. Moreover, conditional on number of migrants, we find no evidence of any direct effect of remittances on either capital input or gross output of farm production. These results are consistent with Zhu et al. (2009) which find that remittances are largely used for consumption purposes using a very large sample of rural Chinese households surveyed in 2001 and 2004. Our findings are also in line with de Brauw and Rozelle (2008) which find no link between migration and productive investment in rural China in the late 1990s.

Our results imply that despite the large positive impact on poverty reduction, a continuing upward trend in rural-urban migration in China alone is unlikely to increase household savings in the rural sector by much. Given that a significant proportion of the savings are expected to finance the construction of new houses, there will be even less savings available for investment in farming and other family business which are essential for sustainable growth and development in the rural sector.

References

Aaberge, R. and Zhu, Y. (2001) The pattern of household savings during a hyperinflation: the case of urban China in the 1980s. *Review of Income and Wealth*, 47(2), pp. 181-202.

de Brauw, A., Huang, J., Rozelle, S., Zhang, L. and Zhang, Y. (2002) The evolution of China's labor market during the reforms. *Journal of Comparative Economics*, 30, pp. 329-353.

de Brauw, A. and Rozelle, S. (2008) Migration and household investment in rural China. *China Economic Review*, 19, pp. 320-335.

de Brauw, A. and Giles, J. (2008) Migrant labor markets and the welfare of households in the developing world: evidence from China. *World Bank Policy Research Working Paper*, no. 4585.

Du, Y., Park, A., and Wang, S. (2005) Migration and rural poverty in China. *Journal of Comparative Economics*, 33 (4), pp. 688-709.

Dustmann, C. and Kirchkamp, O. (2002) The optimal migration duration and activity choice after remigration. *Journal of Development Economics*, 67, pp. 351-372.

Edmonds, E.V. (2002) Reconsidering the labelling effects of Child Benefits: evidence from a transitional economy. *Economics Letters*, 76, pp. 303-309.

Fan, C.C. (2008) *China on the Move – Migration, the State, and the Household* (xx: Routledge).

Galor, O. and Stark, O. (1990) Migrants' savings, the probability of return migration and migrants' performance. *International Economic Review*, 31, pp. 463-467.

Giles, J. (2006) Is life more risky in the open? Household risk-coping and the opening of China's labor markets. *Journal of Development Economics*, 81(1): pp. 25-60.

Giles, J. and Yoo, K. (2007) Precautionary behavior, migrant networks and household consumption decisions: an empirical analysis using household panel data from rural China. *Review of Economics and Statistics*, 89(3): pp. 534-551.

Harris, J.R. and Todaro, M.P. (1970) Migration, unemployment and development: a two-sector analysis. *American Economic Review*, 60, pp. 126-142.

Jacobsen, J.P., and Rayack, W.L. (1996) Do men whose wives work really earn less? *American Economic Review*, 86 (2), pp. 268-273.

Katz, E. and Stark, O. (1986) Labor migration and risk aversion in Less Developed Countries. *Journal of Labor Economics*, 4 (1), pp. 134-149.

Kilic, T., Carletto, G., Davis, B, and Zezza, A. (2007) Investing back home: return migration and business ownership in Albania. *World Bank Policy Research Working Paper*, No. 4366.

Knight, J. and Song, L. (2005). *Towards a Labor Market in China* (Oxford: Oxford University Press).

Kooreman, P. (2000) The labelling effect of a Child Benefit system. *American Economic Review*, 90, pp. 571-83.

Maddala, G.S. (1983). *Limited-dependent and Qualitative Variables in Econometrics* (Cambridge: Cambridge University Press).

McCormick, B. and Wahba, J. (2004). Return international migration and geographical inequality: The case of Egypt. UN University, WIDER Research Paper 7.

Mesnard, A. (2004) Temporary migration and capital market imperfections. *Oxford Economic Papers*, 56 (2), pp. 242-262.

Mincer, J. (1978) Family migration decisions. *Journal of Political Economy*, 86 (5), pp. 749-773.

Ministry of Agriculture (MOA) (2001) *China's Agricultural Development Report* (Beijing: China Agricultural Press).

Murphy, R. (1999). Return migrant entrepreneurs and economic diversification in two counties in south Jiangxi, China. *Journal of International Development*, 11, pp. 661-672.

National Bureau of Statistics (NBS) (2005) *Research on rural labor of China 2005* (in Chinese) (Beijing: China Statistics Press).

National Bureau of Statistics (NBS) (2006) *China statistical yearbook 2006* (Beijing: China Statistics Press).

National Bureau of Statistics (NBS) Online Statistics, The 2000 (5th) Census Data, http://www.stats.gov.cn/tjsj/ndsj/renkoupucha/2000pucha/pucha.htm, in Chinese (accessed Aug 21, 2008).

Naughton, B. (2007) Reframing China policy: the Carnegie Debates. *Journal of Chinese Economic and Business Studies*, 5(3), pp. 193-202.

Piracha, M. and Zhu, Y. (2007) Precautionary savings by natives and immigrants in Germany. *IZA DP* No. 2942.

Ravallion, M. and Chen, S. (2004) Learning from success. *Finance and Development*, 41 (4), pp. 16-19.

Roberts, K.D. (1997) China's `tidal wave' of migrant labor: what can we learn from Mexican undocumented migration to the United States? *International Migration Review*, 31(2), pp. 249-293.

Rozelle, S., Taylor, J.E. and de Brauw, A. (1999) Migration, remittances and agricultural productivity in China. *American Economic Review: Papers and Proceedings*, 89(2), 287-291.

Stock, J.H., Yogo, M. (2005) Testing for weak instruments in linear IV regression, In: D.W.K. Andrews and J.H. Stock (eds) *Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg* (Cambridge: Cambridge University Press), pp. 80-108.

Todaro, M.P. (1969) A model of labor migration and urban unemployment in Less Developed Countries. *American Economic Review*, 59, pp. 138-148.

Wu, Z, and Zhu, Y. (2004) Income differential and out-migration: the impact of between-gap and within-Gap. *Journal of Chinese Economic and Business Studies*, 2(1), pp. 27-38.

Yang, D.T. (1999) Urban-biased policies and rising income inequality in China. *American Economic Review: Papers and Proceedings*, 89 (2), pp. 306-310.

Zhang, K.H. and Song, S. (2003) Rural-urban migration and urbanization in China: Evidence from time-series and cross-section analyses. *China Economic Review*, 14(4), pp. 386-400.

Zhao, Y. (1999) Leaving the countryside: rural-to-urban migration decisions in China. *American Economic Review: Papers and Proceedings*, 89(2), pp. 281-286.

Zhao, Y. (2002). Causes and consequences of return migration: recent evidence from China. *Journal of Comparative Economics*, 30, pp. 376-394.

Zhu, N. and Luo, X. (2008) The impact of remittances on rural poverty and inequality in China. *World Bank Policy Research Working Paper*, No. 4637.

Zhu, Y., Wu, Z., Peng, L. and Sheng, L. 2009. Where did all the remittances go? Understanding the impact of remittances on consumption patterns in rural China. Kent Discussion Paper 09/07.

Figures

Figure 1a: Savings and Net Household Income for non-migrant Households, by Level of Highest Qualifications

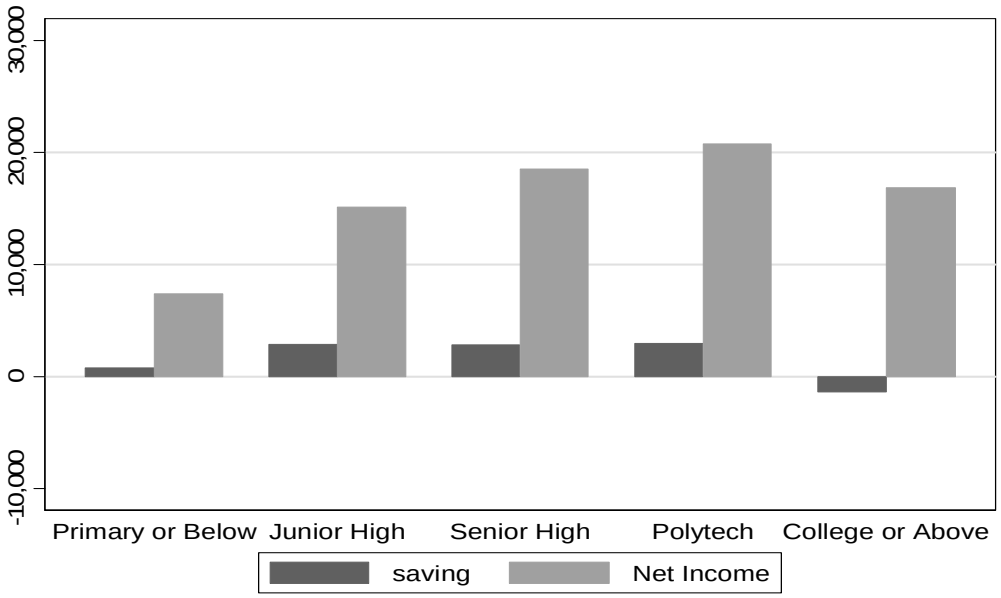


Figure 1b: Savings and Net Household Income for migrant Households, by Level of Highest Qualifications

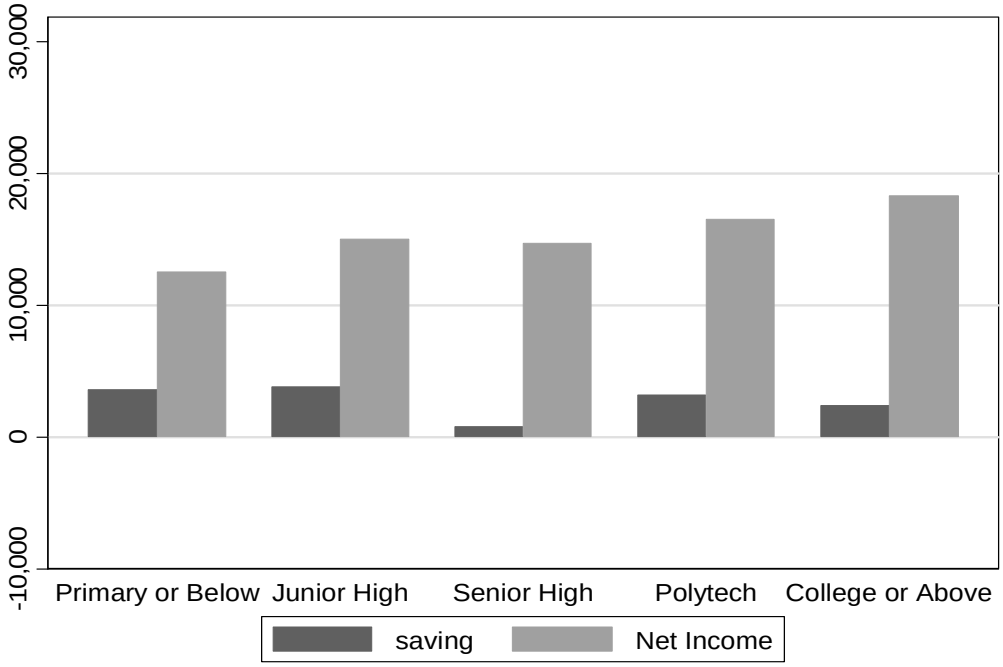


Figure 2a: A Natural Cubic Spline in Net Household Income to Savings, Non-migrant Households

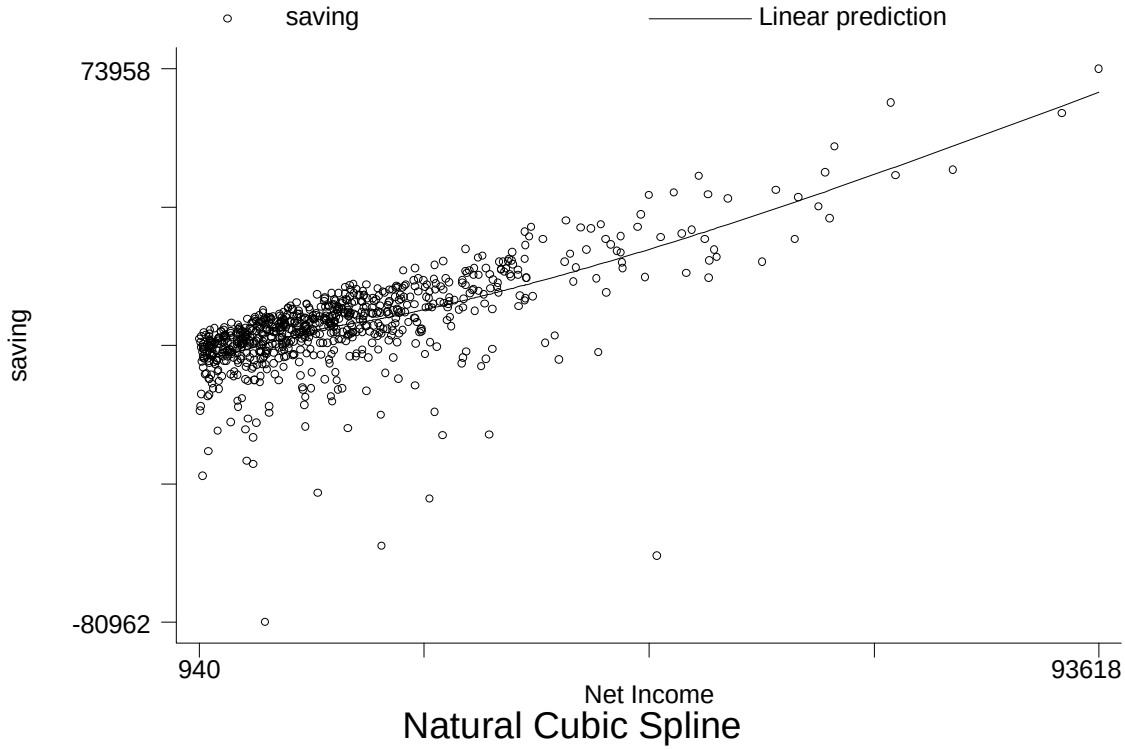
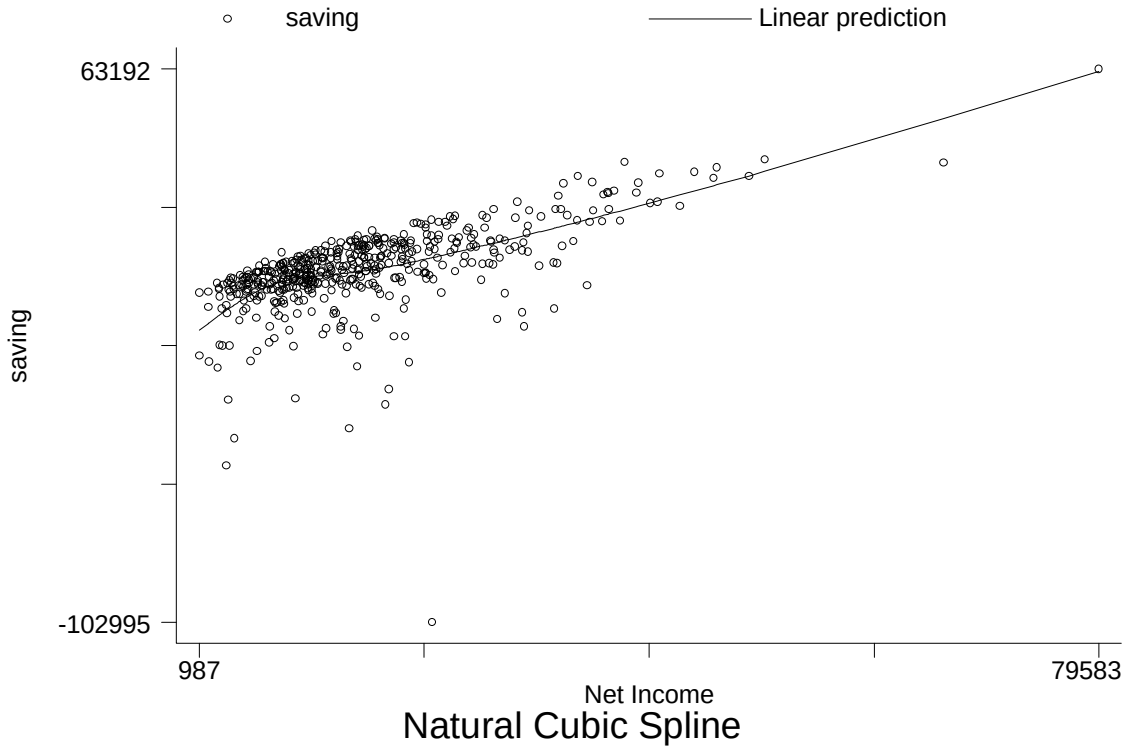


Figure 2b: A Natural Cubic Spline in Net Household Income to Savings, Migrant-Households



Tables

Table 1: Sample Selection

Action Taken	Number of Observations
Original sample size, of which:	1498
- non-permanent residents or non-local ***hukou***	13
- Negative Net Household Incomes	58
- top/bottom 2.5% of the province-specific HH net income distribution	68
- Missing age, education or agricultural land	13
- Xishan County and Wuzhong District	95
Final sample	1251

Table 2: Summary Statistics of households with and without remittances, by Province

	Jiangsu		Anhui	
	Households without remittances	Household with remittances	Households without remittances	Household with remittances
Savings	5385.4	2392.0	802.4	3134.1
As share of Total Net Household Income	25.0%	13.2%	5.9%	21.7%
% with negative savings	37.4%	30.2%	44.1%	35.5%
Total Net Household Income, of which	21534.8	18516.0	13496.7	14459.9
Remittances	-	11249.5	-	9039.1
All other net income	21534.8	7266.5	13496.7	5417.8
Household size	3.62	4.25	3.79	4.44
Of which, dependent children	0.55	0.50	0.77	0.60
Per capita income	6116.4	4583.6	3677.7	3344.7
Per capita cultivated land (*Mu*=0.067 hectare)	1.02	1.16	1.57	1.36
Value of house	76306.1	50791.4	40052.1	34411.4
Age of head of household (HoH)	48.6	50.9	45.4	49.5
Women HoH	0.057	0.038	0.037	0.023
HoH single	0.033	0.047	0.045	0.036
HoH cadre or Communist Party member	0.207	0.189	0.273	0.207
Highest qualification College or Above	0.118	0.113	0.088	0.085
Highest Qualification Polytech	0.077	0.113	0.072	0.101
Highest Qualification Sr. High	0.325	0.264	0.267	0.202
Highest Qualification Jr. High	0.398	0.481	0.501	0.585
Highest Qualification Primary or Below	0.081	0.028	0.072	0.026
Obs	246	106	513	386
Share (%)	69.9%	30.1%	57.1%	42.9%

Table 3: OLS Estimates

Dependent variable: savings	Jiangsu	Anhui	Total
Remittances	**0.846** (0.110)	**0.938** (0.051)	**0.912** (0.048)
Other Net Income	**0.780** (0.041)	**0.768** (0.032)	**0.773** (0.024)
P-value (Remittances = Other Net Income)	0.535	**0.000**	**0.003**
Highest qualification College or Above	**-6039** (2185)	**-2441** (1029)	**-3956** (967)
Highest Qualification Polytech	-2302 (2460)	**-2174** (1005)	**-2189** (988)
Highest Qualification Sr. High	**-3614** (1570)	**-1508** (681)	**-2176** (656)
Highest Qualification Primary or Below	1657 (2949)	1183 (1291)	1389 (1240)
Age of head of household (HoH)	-173 (461)	-64.4 (228)	-93.48 (210)
Age of head of household squared	1.77 (4.60)	1.02 (2.30)	1.26 (2.12)
HoH Single	1725 (3482)	786 (1422)	854 (1390)
HoH Cader or CCP member	319 (1660)	**-2304** (654)	**-1599** (647)
Women HoH	-1373 (3079)	-2274 (1573)	**-1838 (141**5)
Non-agricultural *hukou*	-188.8 (2268)	-1024 (1691)	-292.6 (1286)
Household size	**-1477** (609)	**-1807** (252)	**-1707** (247)
Province dummy (Anhui=1)	-	-	**2733** (626)
Constant	-301 (11388)	-196 (5456)	-2414 (5082)
Adj-R^2	0.508	0.444	0.484
Obs	352	899	1251

Notes: Standard errors in parentheses. Bold cases indicate statistical significance at the 5% level. Omitted category of education is junior high school.

Table 4a: Two-Stage Least Squares Estimates, 2nd stage

Dependent variable: savings	Jiangsu	Anhui	Total
Remittances	0.296 (0.678)	**0.620** (0.306)	*0.530* (0.295)
Other Net Income	**0.718** (0.087)	**0.700** (0.072)	**0.714** (0.051)
P-value (Remittances = Other Net Income)	0.501	0.742	0.462
Highest qualification College or Above	**-6418** (2266)	**-3006** (1173)	**-4205** (1071)
Highest Qualification Polytech	-1515 (2675)	**-2368** (1035)	**-2216** (1007)
Highest Qualification Sr. High	**-3670** (1595)	**-1895** (782)	**-2520** (718)
Highest Qualification Primary or Below	903 (3131)	486 (1466)	614 (1395)
Age of head of household (HoH)	-11.1 (519)	84.4 (270)	76.9 (250)
Age of head of household squared	0.16 (5.07)	-0.32 (2.66)	-0.27 (2.45)
HoH Single	3079 (3900)	1029 (1460)	1315 (1460)
HoH Cader or CCP member	560 (1711)	**-2454** (679)	**-1740** (668)
Women HoH	-1088 (3145)	-2135 (1600)	-1634 (1450)
Non-agricultural *hukou*	-854 (2441)	-767 (1732)	-428 (1314)
Household size	-738 (1091)	**-1314** (532)	**-1142** (499)
Province dummy (Anhui=1)	-	-	**2318** (712)
Constant	-5176 (12996)	-3983 (6593)	-6524 (6053)
Root Mean Squared Error	12191	8146	9465
Sargan Statistic: $\chi^2(1)$	0.069	3.300	1.4422.237
P-value	0.793	0.069	0.230
Obs	352	899	1251

Notes: Standard errors in parentheses. Bold and italic cases indicate statistical significance at the 5% and 10% level respectively. Omitted category of education is junior high school.

Table 4b: Two-Stage Least Squares Estimates, 1st stage

Endogenous variable: remittances	Jiangsu	Anhui	Total
Other Total Net Income (exogenous)	**-0.114** (0.020)	**-0.209** (0.019)	**-0.155** (0.013)
Excluded variables:			
Share of return migrants in the county	*8225* (4843)	**11542** (2766)	**10713** (2389)
Head of household ever migrated	**1823** (912)	931 (598)	**1195** (498)
Test of excluded instruments: (p-value)	**0.010**	**0.000**	**0.000**
Anderson canon. Corr LM test (p-value)	**0.008**	**0.000**	**0.000**
Cragg-Donald Weak identification test (F-stat)	4.725	12.981	17.436
IV size (based on Stock-Yogo critical values)	>0.25	>0.10, <0.15	>0.10, <0.15

Notes: Standard errors in parentheses. Bold and italic cases indicate statistical significance at the 5% and 10% level respectively. Omitted category of education is junior high school.

Table 5a: Tobit Two-Stage Estimates, 2nd stage

Dependent variable: savings	Jiangsu	Anhui	Total
Remittances	0.096 (0.211)	**0.355** (0.161)	**0.254** (0.132)
Other Net Income	**0.747** (0.143)	**0.813** (0.120)	**0.798** (0.092)
P-value (Remittances = Other Net Income)	**0.011**	**0.023**	**0.001**
Highest qualification College or Above	**-6638** (2785)	**-3432** (1304)	**-4661** (1297)
Highest Qualification Polytech	-1427 (2206)	**-3108** (1477)	-2611 (1214)
Highest Qualification Sr. High	**-3758** (1856)	**-1919** (821)	-2636 (774)
Highest Qualification Primary or Below	1308 (2415)	1499 (1499)	1408 (1271)
Age of head of household (HoH)	-58.7 (824)	-20.3 (280)	-6.30 (359.7)
Age of head of household squared	0.83 (8.20)	0.53 (2.60)	0.44 (3.53)
HoH Single	3105 (4249)	1355 (1094)	1400 (1344)
HoH Cader or CCP member	603 (1816)	**-2328** (879)	**-1682** (809)
Women HoH	-1099 (2362)	*-2203* (1293)	-1511 (1114)
Non-agricultural *hukou*	-760 (2335)	-502 (2225)	-125 (1432)
Household size	-729 (1052)	**-1424** (554)	**-1172** (495)
Province dummy (Anhui=1)	-	-	**2085** (777)
Constant	-2039 (21310)	1552 (8019)	-1914 (9259)
Adj-R^2	0.422	0.234	0.335
Root Mean Squared Error	13007	9430	10543
Obs	352	899	1251

Notes: Standard errors in parentheses. Bold and italic cases indicate statistical significance at the 5% and 10% level respectively. Omitted category of education is junior high school.

Table 5b: Tobit Two-Stage Estimates, 1st stage

Endogenous variable: remittances	Jiangsu	Anhui	Total
Other Total Net Income (exogenous)	**-0.655** (0.102)	**-0.680** (0.056)	**-0.651** (0.048)
Excluded variables:			
Share of return migrants in the county	24052 (15243)	**19778** (5640)	**20936** (5417)
Head of household ever migrated	**6152** (2605)	**2917** (1195)	**3611** (1089)

Notes: Standard errors in parentheses. Bold and italic cases indicate statistical significance at the 5% and 10% level respectively.

Table 6: Quantile Regression Estimates

Quantile	Jiangsu		Anhui	
	Remittances	Other Net Income	Remittances	Other Net Income
10-th	0.610	0.734	0.975	0.798
30-th	0.847	0.708	0.797	0.705
50-th	0.838	0.766	0.897	0.735
70-th	0.913	0.814	0.977	0.802
90-th	0.922	0.829	1.014	0.868

Table 7: Impact of Remittances and Migration on Capital Input and Gross Output of Farm Production, OLS and Two-Stage Least Squares Estimates

Dependent variable:	Capital Input of Farm Production		Gross Output of Farm Production	
	OLS	2SLS	OLS	2SLS
Remittances	0.008 (0.016)	0.012 (0.151)	0.006 (0.029)	0.107 (0.255)
Number of migrants	-157 (108)	**-2117** (933)	*-346* (195)	**-3230** (1574)
Highest qual. College or Above	*503* (281)	*1316* (713)	521 (511)	1901 (1204)
Highest Qual. Polytech	*535* (287)	**1043** (456)	742 (523)	**1540** (770)
Highest Qual. Sr. High	-92.0 (186)	-171 (284)	-140 (338)	-123 (480)
Highest Qual. Primary or Below	-302 (349)	*-780* (439)	-214 (634)	-773 (740)
Age of head of household (HoH)	-29.1 (61.1)	**-297** (108)	122 (111)	**460** (183)
Age of head of household squared	-0.41 (0.61)	**-2.90** (1.05)	-1.46 (1.12)	**-4.63** (1.77)
HoH Single	-93.6 (406)	284 (499)	-525 (739)	-108 (841)
HoH Cader or CCP member	8.64 (184)	-172 (228)	199 (333)	-7.69 (385)
Women HoH	3.90 (421)	245 (505)	-62.2 (765)	274 (852)
Non-agricultural *hukou*	53.7 (455)	-189 (543)	356 (827)	33.5 (915)
Household size	**389** (71.2)	**893** (174)	**624** (129)	**1237** (294)
Log per capita land	**2006** (103)	**1838** (138)	**3712** (188)	**3572** (232)
Province dummy (Anhui=1)	**-983** (175)	**-642** (262)	-276 (319)	225 (442)
Constant	905 (1486)	-6644 (2883)	-436 (2701)	**-10006 (**4864)
Root Mean Squared Error	2591	3055	4710	5154
Anderson canon. Corr LM test (p-value)	-	0.000	-	0.000
Sargan Statistic: $\chi^2(1)$	-	0.168	-	3.800
P-value	-	0.682	-	0.051
Obs	1208	1208	1208	1208

Notes: Standard errors in parentheses. Bold and italic cases indicate statistical significance at the 5% and 10% level respectively. Omitted category is education is junior high school.

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