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2002

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April 2009

Abstract: This paper examines the effects of poverty and schooling returns on child labour in Vietnam using household-level data from the Vietnam Living Standards Survey (VLSS) for 1997-98. I find that poverty is a robust determinant of child labour in Vietnam. Being above the poverty line reduces child work by as much as 146 hours a year. There is little additional effect of further increases in income giving support to the idea that child non-work is a luxury good. Schooling returns are statistically significant but the effect on child work hours is small. Interestingly, higher returns in the urban area increase child work hours in adjoining rural regions. This result is consistent with a possibility of increasing returns to education and migration to urban centers for higher training, while remaining siblings work more to make up for the foregone earnings of the migrants and to perhaps pay for the added education expense. I do not find evidence of credit constraints affecting child hours.

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I should thank Pham Hoang Van at the Baylor University, for his continuous help and support throughout this study. I am also very grateful for the thoughtful comments and helpful suggestions of Saku Aura, Emek Basker, Tricia Gladden, Charles Geiss, Peter Mueser and Ken Troske. All errors of course rest solely with the author.

1 Introduction

Although world child labour participation rates have declined steadily over the past half-century, it is still a big problem today as about a quarter of a billion children regularly engage in some form of employment (International Labour Organisation, 2002) often to the detriment of health and human capital formation. Fundamentally, child labour is an issue of inter-temporal allocation: a tradeoff between consumption from the unskilled child's wages (and possibly saved education expenses) today and consumption from the skilled adult's wages tomorrow. If the skilled wage is sufficiently higher than the unskilled wage, then it makes sense for families to invest in education and for the child to work less today. However, if the child's wages are an important part of consumption today, that is, when the family is on the margin of subsistence, then tomorrow's skilled wage ceases to matter as much and the child would work more today. In other words, the extent of child labour depends on the level of poverty and on the returns to schooling.

This paper examines the effects of poverty and schooling returns on child labour in Vietnam using household-level data from the Vietnam Living Standards Survey (VLSS) for 1997-98. Determining whether poverty or low schooling returns is the more dominant cause for child labour is important for the type of policies that should be pursued to reduce child labour. For instance, if poverty is the main cause, then policies directed specifically at the poor would have the desired effect on child labour. If low schooling returns are driving child labour, then policies should focus on improving the quality of schools or promoting the expansion of skilled jobs.

A number of empirical studies in various countries have looked at poverty's role in child labour. The findings have been mixed. Studies by Ray (2000) in Pakistan, Nielsen (1998) in Zambia, Canagarajah and Coulombe (1997) in Ghana, and Sasaki and Temesgen (1999) in Peru do not find a significant positive relationship between poverty and child labor, while studies by Ray (2000) in Peru, and Blunch and Verner (2001) in Ghana do find a significant positive relationship between poverty and child labour. I find that poverty is a robust determinant of child labour in Vietnam. The number of hours that children work declines drastically as families rise above the poverty line but the reduction in work hours falls dramatically for further increases in income. This finding is

consistent with the idea that child non-work is a luxury good, a notion that is the premise for a number of theoretical models of child labour (Basu and Van 1998).

Although the theoretical link between returns to education and child labour is intuitive enough and can be easily shown in a model with endogeneous human capital formation, I am unaware of previous empirical studies that explicitly look at this relationship. For Vietnam, I do not find evidence that differences in schooling returns have an important effect on child work hours. The finding is robust to specifications allowing for the possibility of geographic labour mobility. Relatedly, I also do not find evidence that credit constraints affect the child labour decision or evidence that certain groups have less access to skilled jobs and thus would not respond to higher average returns to schooling.

Finally, one should note that while I focus on the importance of the broad factors of poverty and returns to education, a number of other studies have looked at a host of causes of child labour including income distribution, credit constraints, intergenerational persistence, gender and birth order, parental characteristics, coordination failure, and social norms.[1] The issues studied in these other papers are not exclusive of poverty and schooling returns but are rather in most cases, factors that are consequences of or affect or are incidental to poverty and returns to education.

This paper is organized as follows. Section 2 gives a brief description of the data and of child labour in Vietnam. Section 3 describes the methodology I employ including a discussion of the variables used. The issues of labour market access, labour mobility, and credit constraints will also be discussed here. Section 4 discusses the empirical results. Section 5 concludes.

2 Data

The VLSS 1997-98 is the second in a series of nationally representative surveys in Vietnam. It contains information for 6,002 households consisting of 28,636 individuals with 9,937 children aged 15 years or younger. Community level information was collected on rural and minor urban areas including price data for all important items, the geographic region and population in the communes, the availability of schools in the village, and the availability of other important resources such as roads, waterways, electricity, and water.

Table 1 gives work statistics for children aged 6 to 15. About 22% of children do some extent of work and of those the mean hours of work is 879 for the year. The same fraction of boys and girls work but girls on average work about 85 hours more than boys. The disparity between the ethnic majority (Kinh) and minority groups (the non-Kinh) is stark. The Kinh have a participation rate of 21% while 31% of non-Kinh children work. The non-Kinh work over 1,000 hours a year on average while the Kinh working children work 830 hours. This trend is consistent with the well-documented evidence that the ethnic minorities (non-Kinh) are among the most severely disadvantaged in Vietnam.[2]

Most child labour in Vietnam is concentrated in the rural areas where 27% of children work compared with 7% in the urban areas. The north also has a higher incidence of child labour with participation rates ranging from 26% to 38%, while in the relatively affluent south, only 13% to 14% of the children work. However, mean work hours are lowest at 549 in the Red River Delta region (the area around the capital, Hanoi) and highest at 1,032 in the Central Highlands and along the Central Coast region. This last figure is not surprising since there is a high concentration of ethnic minorities in the Central Highlands and along the Central Coast.

I derive a variable called 'per capita net expenditure' to proxy for household non-child income. A detailed explanation of this variable is provided in the next section. Child labour is most prevalent in families in the lowest income group (income being proxied by per capita household expenditures). In this poorest group 35% of children work and those who work average over 1,000 hours a year. Participation rates decline with increasing income as do hours, with the one exception that mean hours worked increases for the highest group. Since participation rates are so low for this highest income group, this will likely not affect the analysis.

Table 2 provides summary statistics for variables used in the analysis for the sample of 7079 children aged 6-15. The number of boys and girls are roughly equal while 82% of the sample are from the ethnic majority group. Summary statistics for other household, community variables and regional dummies are also provided in table 2.

3 Methodology

The basic specification used in our analysis is as follows:

$$h_i = \beta_0 + \beta_1' \mathbf{I}_i + \beta_2 rte_i + \beta_3' \mathbf{X}_i + u_i, \quad (1)$$

where h_i denotes the number of hours worked by child i, $\mathbf{I}_i$ is a vector of dummy variables indicating the level of per capita household expenditures, rte_i is the returns to schooling in the region where child *i* resides, $\mathbf{X}_i$ is a vector of control variables including child, family, and the community characteristics, and u_i is an error term assumed identically, independently distributed normal. The unit of observation is a child aged 6-15. I drop the subscript i in subsequent notation where it is unambiguous to do so. Since the labor participation rate within the sample is only 22%, OLS estimation is clearly inappropriate. I instead use a Tobit model to estimate the hours equation.

The vector $\mathbf{I}_i$ is a vector of dummy variables indicating household per capita income. I use expenditures to proxy for income for two reasons. First, expenditures are more readily accessible from the survey data than income. About 80% of the population do not have wage income but are rather, self-employed. Calculating household income for the group of non-wage earners is difficult and subject to error. Second, income, particularly farm income, is subject to shocks and short-term fluctuations whereas households tend to smooth consumption.

I am interested in the portion of household expenditure that does not include income from the child's work. Total household expenditure, however, would include the child's income. I address this endogeneity of the income and child work hours by subtracting from household expenditures an 'imputed child income' based on a wage predicted by the child's characteristics. Prediction of the child's wage is made from the following log wage equation:

$$\begin{aligned} \log Wage = {} & \alpha_0 + \alpha_1 Sec + \alpha_2 Voc + \alpha_3 Uni + \alpha_4 Exp + \alpha_5 Exp^2 \\ & + \alpha_6 Female + \alpha_7 \log HoursPerWeek + \nu, \end{aligned} \quad (2)$$

where $Wage$ is the hourly wage, Exp is work experience,[3] $Female$ is a dummy variable, and Sec, Voc, and Uni are dummies taking a value of 1 if the individual has, as the highest education achievement, finished secondary school, vocational school, or college, respectively. The log of the variable $HoursPerWeek$ is included to control for different types of wage contracts. The error term ν is assumed normal i.i.d.. Equation 2

is estimated using ordinary least squares for all wage earners in each of the six geographic regions in Vietnam.

From each child's characteristics reported in the survey, I use the preceding estimation to impute an hourly wage for each working child. This method of imputing hourly wage is based on two assumptions. First, it assumes that non-wage workers would earn equivalently the same as wage workers when they have the same individual characteristics. In other words, all workers have access to both wage and non-wage labor markets. Second, it assumes that any two children of the same gender, experience, education level, who worked the same numbers of hours in the past week and lives in the same region can earn the same hourly wage. Differences in productivity that might arise due to unobserved heterogeneity among different children are ignored. Since variation in child wages is small, unobserved heterogeneity is probably also small. Imputing child wage in this way also assumes that differences in adult and child wages are fully reflected in differences in age, education, experience, and hours worked.

The imputed hourly wage is then multiplied by the number of hours the child has worked in the year to arrive at the child's income for the year. This is subtracted from total household expenditure and divided by the number of people in the household to give what I call 'net household expenditure per capita.'[4]

I base the income categories on the standard poverty line used in the literature. Based on a basket of goods satisfying a 2,100 calorie-per-day requirement, Glewwe, Gragnolati and Zaman (2002) calculated a poverty line to be 1,789,871 dong per person per year for the 1997-98 sample period. I consider five different income groupings: those whose net household expenditure per capita is below this poverty line (the omitted category), those above the line but below twice the poverty line (*pcexp1*=1), those between two and three times the poverty line (*pcexp2=1*), those between three and four times the poverty line (*pcexp3*=1), and those above four times the poverty line (*pcexp4*=1).

I generate variation in the *rte* variable by dividing the sample into 24 groups: {6 geographic regions }×{rural,urban)×{male, female}. For each group, I estimate the log wage equation:

$$\log Wage = \gamma_0 + \gamma_1 Sec\_Above + \gamma_2 Exp + \gamma_3 Exp^2 + \gamma_4 \log HoursPerWeek + e, \quad (3)$$

which is similar to equation (2) except for the one lone education variable, Sec_Above, which takes a value of 1 for people completing secondary school or education beyond the secondary level. Note that the gender dummy present in equation 2 has been removed since gender is now a dimension along which the different groups are constructed. The OLS point estimate of the coefficient γ_1 is used as the value of rte for each of the 24 groups.

4 Results

Table 3 presents the results of the maximum likelihood estimation of the Tobit model for the full sample and for the urban and rural samples separately. Being above the poverty line is highly significant for each sample estimate. On average, compared to a child in a household below the poverty line, a child in a household just above the poverty line but below twice the poverty line works 146 hours less for the rural sample, 50 hours less for the urban sample, and 137 hours less for the full sample. Note that the reduction in hours worked falls sharply for further increases in the expenditure level. For instance, in the full sample, there is only a 27-hour difference between being just above the poverty line and being one expenditure level above; only a nine-hour difference between this group and the one above; and no further reduction in work hours in going to the next highest expenditure group. These results suggest a highly nonlinear relationship between child work hours and income (expenditures) supporting the idea that child 'non-work' is a luxury good[5].

Returns to schooling (*rte*) is statistically significant for the full sample. However, the effect is small. A ten percent increase in the return reduces the numbers of hours worked by less than ten hours for the entire year. Schooling returns is not statistically significant within the urban and rural samples, suggesting that the variable's significance for the full sample is driven by rural-urban differences in schooling returns.

As expected, work hours increase with age. Children belonging to the majority ethnic group "*kinh"* work 46 hours less in the full sample than non-Kinh children and 57 hours less in the rural sample. The *kinh* variable is not significant for the urban sample -

most likely because the number of non-kinh were too few in the urban areas. Gender is only statistically significant (at the 5% level) in the rural sample where being a girl increases work hours but only by 25 hours a year.

Among the household variables, the number of adults in a household is statistically significant but again the effect is small. Having one additional adult in the household reduces child work by only 23 hours in the full and rural samples and by 14 hours in the urban sample. Children in households with female heads work 38 hours less in the rural sample and 35 hours less in the full sample. The education level of the household head (*educyr98*) only matters in the urban sample where an additional year of schooling reduces the child's work hours by about 9 hours. The size of the household's landholding does not affect child work hours.

In the rural sample, having a primary school within the village, an indication of lower schooling costs, reduces hours of work by 100 in one year. Having access to a transport waterway reduces hours worked by 34 hours. Interestingly, the presence of a secondary school in the village and access to a road actually *increases* work hours by 69 and 41 respectively. This result is consistent with the possibility that economic activity in the village increases with the presence of both of these public goods. It is important though the increase in the economic opportunity raises wages for those with and those without a secondary school education about equally. Otherwise, the effect that I observe these variables having on school hours would have been captured by the *rte* variable.

In summary, the biggest effect on child work hours is being above the poverty line. The effect on hours for increases in household expenditures beyond that tapers off quickly. Differences in schooling returns do not seem to affect work hours much. Before concluding that labour market conditions do not affect child labour in Vietnam, I consider the issues of labour mobility and labor market access. First, families may be responding to labor market conditions not only in their own village or province but also in the nearby city center. Second, labour markets may be segmented. That is, even if schooling returns are observed to be higher, the skilled jobs may not be accessible to some groups within society. Those children belonging to this group would thus not reduce work hours to increase investment in education to take advantage of the higher return. I consider these two issues in the next two subsections.

4.1 Labour Mobility and Labour Market Access

Migration to the urban centers is a common phenomenon in the developing countries and Vietnam is no exception. Half a million people migrated to Ho Chi Minh City in the second half of the 1990s (Thanh, 2002). About 20% of the population in Ho Chi Minh City are considered 'illegal' migrants. With rural-urban migration being so active in Vietnam, it is reasonable to think that child labour decisions are made considering not only schooling returns in the local labour market, but also that in the closest urban center as well. To accommodate the possibility of migration, I include the schooling return of the nearest urban center (*rteurb*) in the hours regression for the rural sample. Results are shown in table 4. Interestingly, the sign on the *rteurb* is *positive* and statistically significant, meaning that a higher return in the urban center results in a rural child working *more* hours!

Two possibilities may explain this result. First, suppose families in the countryside do invest more in a child's education when schooling returns are higher. Investment in education however, is likely to exhibit increasing returns, that is, the return to a college education is much higher than that of a secondary education. Intra-household allocation of resources would therefore not be uniform. Many families are likely to invest in one child (or only a few children) by sending him to school in the city leaving the remaining siblings to stay at home and work longer hours to make up for the forgone earnings of the migrant and to perhaps pay for the added education expense.[6] This would result in a positive relationship between returns in the urban center and work hours in the rural areas.

A second possibility is that of labour market segmentation. Some groups in society may not have access to the skilled labour market and thus the higher returns to schooling do not apply to them. If higher demand for skilled labour in the urban center corresponds to overall economic growth, then demand for unskilled labour in the neighboring rural areas would likely increase as well. Those groups without access to the skilled labor market would work more in response to the higher unskilled wage.

I test for these possibilities by interacting the *kinh, girl,* and *hdagforest*[7] variables with the *rte* variable and the *roadtransp* and *watertransp* variables with the *rteurb* variable. Recall that *kinh* takes a value of 1 when the child belongs to the majority ethnic

group. The non-Kinh in Vietnam are made up mostly of the ethnic minorities who are more disadvantaged economically than the Kinh. Higher returns to schooling may not apply to this group. For similar reasons, I interact the *girl* and *hdagforest* variables with *rte*. Household heads who are farmers or work in forestry may have fewer connections in the skilled sector and thus their children may have less access to skilled jobs.

Interacting *roadtransp* and *watertransp* with *rteurb* is based on the idea that villages without access to a road or waterway would tend to be more isolated from the cities and people living in these villages would thus have less connections to the cities and are less likely to migrate.

Results for these specifications are given in table 4. None of the interaction terms described above are significant. Thus I cannot find evidence of labour market segmentation or labour mobility being important. However, one should be careful to qualify that this non-finding is for the particular variables used here. Labour market segmentation, for instance, may exist along different dimensions.[8] The expenditure variables continue to be highly significant and their marginal effects show that poverty continues to be the major determinant of child work hours.

4.2 Credit Constraints

Children in poorer households may work more possibly at the cost of human capital development and higher future earnings if their families are credit constrained.[9] If education is self-financed or if credit is less readily available to the poor, then one would see schooling returns not mattering in child labor decisions for the very poor; mattering more for those with more resources; and again possibly not mattering at all for the very affluent for whom education may be more important for its consumption rather than capital value. I test for the possibility of credit constraints by interacting the four expenditure dummy variables (*pcexp1-4*) with schooling returns (*rte*).

Results of the estimation for the full, rural only, and urban only samples are shown in table 5. None of the variables containing *rte* are statistically significant. Again, the child work hours can be explained almost entirely by being above or below the poverty line. Since I am controlling for the possibility of credit constraints, this gives further support to the idea that child non-work is a luxury good in Vietnam.

5 Concluding Remarks

Child labour in terms of work hours is explained almost entirely by poverty in Vietnam.[10] Hours worked drop drastically as a child moves above the poverty line. Returns to education are statistically significant for some specifications of the model but the extent of the effect is small. I find some evidence to suggest that rural-urban migration is important and that households are possibly allocating more resources to one child in response to higher schooling returns in the cities. Again, however, the effect of schooling returns on work hours is small. I don't find evidence to support the presence of credit constraints.

The results, though, should be taken with caution. First, the *rte* variable was generated by constructing 24 different groupings within the sample. The low variation thus presents a problem in the power of the test of the effect of *rte* and the test for credit constraints. Subsequent studies would need to find creative ways to generate more variation in *rte.* Second, I only address one type of endogeneity between child hours worked and household income by subtracting out the imputed child income. There is still the problem that child hours worked and household per capita rxprnditures are jointly determined. An alternative would be to find a suitable instrument for per capita expenditure.

With these caveats, these results point out that policies to reduce child labour in Vietnam should be the same policies to alleviate poverty directly. Expanding employment and increasing wages for the unskilled would reduce child labour in Vietnam. Thus, the fear that expanded trade would increase child labour appears misplaced in Vietnam. If per capita expenditure works as a good predictor for wages, as wages rise for adults, child labour would be reduced.

Based on these results, programs to alleviate poverty directly should continue to merit high priority. Improving the lot of the rural poor through investments in infrastructure and direct educational subsidy would have high social return as this in the longer run would reduce child labour and increase human capital development. Particularly, direct assistance for the ethnic minorities is a worthwhile policy to reduce child labour.

Notes

[1] For a survey of issues, see Basu (1999); on income distribution, see Swinnerton and Rogers (1999); on credit constraints, see Baland and Robinson (2000) and also Ranjan (2001); on intergenerational persistence, see Emerson and Souza (2003); on gender and birth order, see Horowitz and Wang (2002) and also Emerson and Souza (2002); on coordination failures, see Dessy and Pallage (2001); and on the importance of social norms, see Lopez-Calva (2001).

[2] For a discussion on the disparities between the Kinh and non-Kinh, see Glewwe, Gragnolati, and Zaman (2002).

[3] In the VLSS, there are some children who started schooling at the age of 5, so to avoid negative values I calculate work experience as $Exp = Age - 5 - Years\_of\_Schooling$.

[4] I ignore the possibility of scale economies in household size.

[5] I also ran alternative specifications replacing the category expenditure variables with the log of per capita expenditure and also included a quadratic term for per capita expenditure. The results also reveal the significant nonlinear relationship between hours of child work and per capita ecpenditure. However, the results using the category groupings highlight more clearly the nonlinear relationship around the poverty line.

[6] The idea that migration from the countryside results in those remaining in agriculture to work more was introduced by Sen (1966) as an explanation of "surplus labor" in agriculture. .

[7] This variable takes a value of one if the head of household is employed in agriculture or forestry sector.

[8] A good variable to test for labor market segmentation is "Communist Party Membership." The idea is that children of party cadre would have better access to skilled jobs than those outside the party. The VLSS does allow respondents to specify whether they are party members. However, interestingly, according to the responses in the sample, the number of household heads who were members of the communist party was zero!

[9] For models highlighting credit constraints as an explanation of child labour, see Baland and Robinson (2000), and Ranjan (2001).

[10] My results here are consistent with Edmonds' (2001) finding that improvement in living standards accounted for most of the reduction in child labour incidence in Vietnam over the period 1993-97.

Table 1. Work Statistics for Children Aged 6-15

	Number of Children (Working and Non-Working)	Participation Rates	Mean Hours Worked (includes working children only)
TOTAL	7,079	22	879
Boys	3,647	22	838
Girls	3,432	22	923
Kinh	5,869	21	830
Non-Kinh	1,210	31	1,033
Rural	5,595	27	883
Urban	1,484	7	804
S. Central Coast & Central Highlands	1,206	15	1,032
Southeast	1,362	13	944
Mekong River Delta	1,343	14	958
Red River Delta	1,113	26	549
N.East & N.West	1,170	35	991
N. Central Coast	885	38	871
Per capita Expenditure (dong)			
Less than 1,789,871 (poverty line)	3,056	35	1,015
Between 1,789,871 and 3,579,742	2,764	16	616
Between 3,579,742 and 5,369,613	704	8	585
Between 5,369,613 and 7,159,484	299	4	254
More than 7,159,484	256	3	608

Table 2. Summary Statistics of Children Aged 6-15 (7079 total, variable names in parentheses)

	Mean	SD
Child		
Hours of work	217.58	521.85
Age	10.71	2.85
Girl	0.49	0.50
Kinh (majority ethnic group)	0.82	0.38
Household		
1,789,871< Net Expenditure per capita ≤3,579,742 (*pcexp*1)	0.38	0.49
3,579,742< Net Expenditure per capita ≤5,369,613 (*pcexp*2)	0.085	0.28
5,369,613< Net Expenditure per capita ≤7,159,484 (*pcexp*3)	0.035	0.18
7,159,484< Net Expenditure per capita (*pcexp*4)	0.028	0.17
Age of Household Head (*age_HH_head*)	42.78	9.89
Gender of Household Head (*headfem*)	0.17	0.37
Years of Education of Household Head (*educyr98*)	7.54	4.036
No. of Adults (*numadult*)	2.95	1.29
No. of Children (*numchild*)	2.84	1.26
Land Holding (*totalland*)	28,370.69	58,729.69
Occupation of Household Head		
Leaders (*hdleader*)	0.043	0.20
Professionals (*hdprofessional*)	0.061	0.24
Sales (*hdsales*)	0.13	0.33
Agriculture and forestry (*hdagforest*)	0.78	0.41
Skilled manual (*hdskilmanual*)	0.18	0.38
Machine operators (*hdmachineoper*)	0.036	0.19
Community Variables		
Primary School (*primschool*)	0.53	0.50
Secondary School (*secnschool*)	0.25	0.43
Road Transportation (*roadtransp*)	0.81	0.39
Water Transportation (*watertransp*)	0.50	0.50
Quality of water supply (*watersupply*)	0.32	0.47
Electricity (*elecsupply*)	0.91	0.29
Price of Rice (*riceprice*)	3,428.56	492.14
Region		
Urban	0.17	0.38
Southeast	0.13	0.34
South Central Coast	0.21	0.41
Central Highlands	0.11	0.32
North Central Coast	0.15	0.36
Red River Delta	0.19	0.39
Northeast and Northwest	0.21	0.40

Table 3. Tobit Results of Hours of Work

	Full Sample		Urban Sample		Rural Sample	
	Coefficient	Slope	Coefficient	Slope	Coefficient	Slope
pcexp1	-835	-137	-1,562	-50	-766	-146
	(47)**		(297)**		(48)**	
pcexp2	-1,342	-164	-1,856	-51	-1,233	-178
	(98)**		(360)**		(111)**	
pcexp3	-1,785	-173	-2,236	-52	-1,568	-189
	(174)**		(450)**		(227)**	
pcexp4	-1,753	-172	-2,732	-53	-1,058	-169
	(208)**		(563)**		(314)**	
rte	-3.58	-0.96	6.45	0.55	-4.36	-1.3
	(1.38)**		(4.01)		(2.22)	
agechild	464	124	1,414	120	411	122
	(79)**		(618)*		(79)**	
agesqr	-5.5	-1.5	-40	-3.4	-3.4	-1.0
	(3.4)		(25)		(3.4)	
girl	73	20	-23	-1.9	84	25
	(40)		(219)		(42)*	
kinh	-161	-46	-141	-13	-181	-57
	(55)**		(365)		(55)**	
numchild	-17	-4.6	-56	-4.7	-15	-4.3
	(16)		(88)		(17)	
numadult	-87	-23	-168	-14.2	-78	-23
	(17)**		(77)*		(18)**	
headfem	-137	-35	-1.8	-0.2	-134	-38
	(59)*		(218)		(63)*	
age_HH_head	-1.4	-0.4	-1.96	-1.6	-0.027	-0.0
	(2.5)		(12)		(2.6)	
educyr98	-7.1	-1.9	-103	-8.7	1.6	0.5
	(5.9)		(29)**		(6.2)	
totalland	0.0	0.0	0.009	0.0	0.0	0.0
	(0.0)		(0.004)*		(0.0)	
hdleader	195	58	1,126	186	112	35
	(99)*		(521)*		(100)	
hdprofessional	-50	-13	364	37	-84	-24
	(96)		(408)		(100)	
hdsales	157	45	603	61	110	34
	(70)*		(247)*		(77)	
hdagforest	267	67	628	67	56	16
	(63)**		(251)*		(71)	
hdskilmanual	107	30	21	1.8	103	32
	(56)		(261)		(58)	
hdmachineoper	-195	-47	710	90	-273	-70
	(126)		(385)		(139)*	
primschool	-307	-85	633	42	-331	-100
secnschool	(45)**		(318)*		(46)**	
	126	35	-297	-28	213	69
roadtransp	(59)*		(269)		(63)**	
	148	38	1,117	49	143	41
watertransp	(54)**		(613)		(54)**	
	-112	-30	623	41	-116	-34
watersupply	(43)**		(293)*		(44)**	
	-223	-57	-640	-74	-94	-27
elecsupply	(53)**		(286)*		(55)	
	-65	-18	-	-	-85	-26
riceprice	(67)		-		(67)	
	0.09	0.0	0.58	0.05	0.035	0.0
	(0.04)*		(0.16)**		(0.045)	
	N = 7024 (1568 working)		N = 1429 (83 working)		N = 5595 (1485 working)	
	Log likelihood = -14579.7		Log likelihood = -836.4		Log likelihood = -13658.2	

Notes: Standard errors in parentheses. Regressions include a constant term. * significant at 5%; ** significant at 1%.

Table 4. Tests for Labour Mobility and Market Access: Tobit Results for Rural Sample

	Coeff.	Slope	Coeff.	Slope	Coeff	Slope	Coeff	Slope	Coeff.	Slope	Coeff	Slope
pcexp1	-757	-144	-756	-144	-750	-142	-757	-144	-757	-144	-755	-144
	48**		48**		48**		48**		48**		48**	
pcexp2	-1232	-177	-1240	-178	-1219	-176	-1232	-177	-1232	-177	-1230	-177
	111**		111**		111**		111**		111**		111**	
pcexp3	-1558	-187	-1,573	-188	-1547	-186	-1559	-187	-1558	-187	-1551	-187
	226**		226**		226**		226**		226**		226**	
pcexp4	-1090	-170	-1120	-172	-1077	-168	-1092	-170	-1092	-170	-1084	-170
	313**		314**		312**		313**		313**		313**	
rte	-5.66	-1.68	-12.33	-3.66	-1.52	-0.45	-4.96	-1.47	-5.69	-1.69	-5.71	-1.69
	2.25*		4.24**		3.24		6.72		2.25*		2.25*	
rteurb	2.58	0.77	2.81	0.83	2.53	0.75	2.58	0.77	1.84	0.55	3.13	0.93
	0.73**		0.74**		0.73**		0.73**		1.75		0.83**	
rte*kinh			8.63	2.56								
			4.63									
rte*girl					-7.35	-2.17						
					4.15							
rte*ag							-0.77	-0.23				
							6.96					
rteurb*road									0.85	0.25		
									1.83			
rteurb*water											-2.06	-0.61
											1.42	
N=5595 (1485 working)												
Log likelihood	13652		13650		13650		13652		13652		13651	

Notes: Regressions control for variables shown in table 3 and it includes a constant term. Standard errors shown below coefficients. * significant at 5%; ** significant at 1% for all the column except for the first column, where * means interaction. All Log likelihood are negative.

Table 5. Tobit Regressions of Hours of Work: Specification to Test Credit Constraints

	Full Sample		Urban Sample		Rural Sample	
	Coefficient	Slope	Coefficient	Slope	Coefficient	Slope
pcexp1	-822	-136	-1,851	-63.0	726	-140
	(55)**		(455)**		(59)**	
pcexp2	-1,356	-164	-2,146	-63.9	-1,192	-175
	(130)**		(588)**		(155)**	
pcexp3	-1,960	-174	-2,332	-64.2	-2,001	-192
	(260)**		(765)**		(434)**	
pcexp4	-1,692	-172	-2,340	-64.2	-2,062	-193
	(319)**		(827)**		(814)*	
rte	-3.18	-0.86	1.39	0.14	-2.79	-0.82
	(2.21)		(7.62)		(2.86)	
rte*pcexp1	-1.14	-0.31	7.07	0.71	-4.61	-13.60
	(2.70)		(8.18)		(421)	
rte*pcexp2	0.40	0.11	7.46	0.75	-3.66	-10.81
	(4.51)		(11.28)		(882)	
rte* pcexp3	6.31	1.69	2.78	0.27	26.22	7.74
	(7.14)		(15.44)		(21.59)	
rte*pcexp4	-2.42	-0.65	-10.85	-1.09	48.62	14.35
	(8.93)		(18.23)		(34.87)	
	N = 7024 (1568 working) LR chi2(28) = 2637.45 Log likelihood = -14579.728		N = 1429 (83 working) LR chi2(27) = 251.38 Log likelihood = -836.4		N = 5595 (1485 working) LR chi2(28) = 2204.23 Log likelihood = -13658.2	

Notes: Regressions control for variables shown in table 3 and include a constant term. Standard errors in parentheses. * significant at 5%; ** significant at 1%. The '*' in first column indicates interaction term.

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