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Does Migration Income Help Hometown Business? Evidences from Rural Households Survey in China

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Abstract

This empirical study examines effects of household migration income on non-farm business in rural China. The restrictions on labor mobility in China were loosened after the economic reform in 1978. As a result, more and more rural households have family members engaging in temporary migration, working and living between rural home and urban areas, which forms a large "floating" population of migrant workers. The income migrant workers bringing home provides a vital capital resource for the credit deprived rural areas, and hence strongly promotes hometown non-farm business. This paper raises three questions: first, how does migration income affect the probability that rural households will start non-farm business? Second, how does migration income impact the probability that rural households will remain in non-farm business after starting up? Third, whether and how much does migration income increase non-farm business income? The findings indicate that migration income not only raises the probability of starting and remaining in non-farm business, but also increases non-farm business income. The empirical results in this paper confirm that, for financially constrained rural households in China, migration income offers a valuable capital resource and facilitates the development of diverse business operation in rural China.

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1 Introduction

As China experiences dazzling growth and plays an indispensable role in the global economy, there is an increasing interest in academia to learn more about this country from all dimensions. In studying its rural economy, two issues draw attentions from researchers and policy makers: first, the unprecedentedly large scale of rural-urban migration accompanying the ongoing urbanization process. Second, the transformation of rural economy from a uniform agricultural entity to a more diversified one, embracing the development of non-farm business and rural industry.

Before the economic reform in 1978, rural-urban migration was strictly forbidden in China through household registration and commodity stamps control. Since 1978, the State has loosened restrictions on rural-urban labor movements gradually (Chan and Zhang (1999)). As a result, more and more rural households have at least one family member working in urban areas. These migrant workers maintain their household registration and social networks in rural hometown, therefore they frequently move back and forth between rural home and urban work sites, which has created a large class of "floating population" (*Liudong Renkou*). According to the Research Team in the State Council of China (2006), there were less than 2 million migrant workers in the early 1980s. That number has increased to 229.78 million in 2009, according to a report publicized by the National Bureau of Statistics in China (NBSC) in 2010. At the same time, rural China witnessed a dramatic growth of non-farm business. Prior to the reform, rural production was dominated by farming, including growing crops, planting forests, fishing, and keeping animals. Rural non-farm production emerged once the economic reform ended the formerly uniform agricultural production methods and ownerships. According to NBSC (2005), employment in rural non-farm sectors expanded from 9.163 million in 1980 to 190.993 million in 2004, and the share of rural non-farm sectors in total rural employment increased from 2.98% in 1980 to 38.43% in 2004.

Therefore, the questions is whether migration helps hometown non-farm business and investment, and if so, through what kind of mechanism. There have been many studies in the literature exploring the effect of migration income on hometown business in developing countries. Adams (1991) identifies how migration income affects the investment behavior of different types of migrants. Lopez and Selligson (1991) illustrate the positive impacts of migration income on small business investment in El Salvador. Based on a panel data set from rural Pakistan, Adams (1998) clarifies the effects of migration remittances on the accumulation of physical assets in rural areas. McCormick and Wahba (2001) study the impact of return migration on the characteristics and nature of non-farm small enterprises through data from Egypt. Taylor (2006) shows that Mexican households with migration earnings spent more on investments than other households at the same income level. For the case of China, conclusions on relationship between migration income and hometown non-farm business are mixed. Murphy (2002) finds one fifth of individual enterprises in surveyed rural areas were owned by migrant workers. Zhao (2002) argues that return migrants invest significantly more in productive farm assets. de Brauw and Rozelle (2003) find no evidence of a link between migration and productive investments in rural areas.

With rural households survey data in China, this paper aims to provide an empirical investigation on the impact of migration income on rural non-farm business. Section two describes the data. Section three contains three independent subsections, examining the

effects of migration income on the probability of entering and staying in non-farm business, and on income from non-farm business. Section four offers concluding remarks.

2 Data

This paper employs the China Rural Households Survey data collected by the Research Center for Rural Economy (RCRE), a research institute in the Agricultural Ministry of China. Different from census data, the RCRE data is a panel data set covering 10 provinces[1] from 1984 to 1999[2] with exception of 1994. This paper adopts data from the RCRE survey from 1995-99. The reason to choose this time frame is that the RCRE survey was not conducted in 1994 due to lack of funding, which induces severe discontinuities in several dimensions of the data set. After cleaning the data set, we are left with 5626 rural households who have participated in all five annual survey during 1995-99.

Rural households in China derive their income mainly from three sources: farm sector, non-farm sector, and migration work. Farm sector work includes growing crops, planting forests, fishing, and keeping animals. Non-farm sector include manufacturing (including agricultural product processing), construction, transportation, retailing, lodging and restaurants, and other services. Figure 1 illustrates that from 1995 to 1999, the proportion of rural non-farm households increased steadily from 19.32% to 26.04%, and that of farm households decreased from 80.68% to 73.95%. Meanwhile, the proportion of households earning migration income increased from 40.43% in 1995, to 47.67% in 1999.

Table I presents the definition and summary statistics of relevant variables. The average number of labor in a rural household is 2.61. The proportion of male family members is 54.17%. The education level in general was still quite low in rural China during the survey period. 15.29% of the surveyed households did not have any kind of education at all, 40.06% only finished elementary school, 37.08% had middle school education, while only 7.55% went to high school. If we denote a_i to be the proportion of people in a household with i years of education, then the average schooling length of a household is as follows:

$$EDUCATION = \sum_{i=0,6,9,12} a_i \times i \tag{1}$$

Farm households obtained most of their income from farm sector jobs, and their average annual income was 1827.64 yuan (equivalent to 219.63 US dollars during 1995-99). Non-farm households earned most of their income from the non-farm sector jobs, and their average annual income was 4454.42 yuan (equivalent to 535.29 US dollars during 1995-99). Thus non-farm households earned about 2.39 times that of farm households. Furthermore, non-farm households earned more income from migration activities, 1268.92 yuan (equivalent to 152.48 US dollars during 1995-99), 46.64% higher than the migration income earned by farm households.

[1]The 10 provinces are: Shanxi, Jilin, Jiangsu, Zhejiang, Anhui, Henan, Hunan, Guangdong, Sichuan, Gansu.

[2]China Rural Households Survey continues from 2000-2003. However, the pool of households in that survey are significantly different from the ones before 2000, and the total number of households has decreased.

Table II indicates that farm income is negatively correlated with both non-farm and migration income. However, rural non-farm income and migration income are positively correlated. Even though no causal relationship can be drawn from this positive correlation coefficient, it suggests the possibility that migration income boosts rural non-farm business. The following section conducts more econometric tests to further investigate the causal relationship.

3 Methodology and Estimation Results

3.1 Probit Model of Entering Non-farm Business

The first task is to investigate whether migration income raises the probability that rural households *enter* non-farm business, given that households were not in non-farm business last period. We distinguish between the observed binary outcome, $ENTER_{it}$, and an underlying continuous unobservable (or latent) variable, $ENTER^*_{it}$, that satisfies the following model:

$$ENTER^*_{it} = \alpha_0 + \alpha_1 ln(MIGINC_{i,t-1}) + \alpha_2 ln(FARMINC_{i,t-1}) + X'_{it}\Omega + \epsilon_{it}, \qquad (2)$$

Although $ENTER^*_{it}$ is not observed, we do observe

$$ENTER_{it} = \begin{cases} 0, & \text{if} \quad ENTER^*_{it} > 0 \quad \leftrightarrow \quad \text{No entering in period } t \\ 1, & \text{if} \quad ENTER^*_{it} \leq 0 \quad \leftrightarrow \quad \text{Entering business in period } t \end{cases} \qquad (3)$$

$MIGINC_{i,t-1}$ represents migration income in period $t-1$; $FARMINC_{i,t-1}$ is income from farm sector in period $t-1$. X_{it} is a vector including controls of demographic characteristics, such as education, number of labor in the family, whether in coastal or inland areas, etc.

Cautions need to be taken on variable $MIGINC_{i,t-1}$. If $E(\epsilon_{it}|MIGINC_{i,t-1}) \neq 0$, endogeneity problem will result in an inconsistent estimate for α_1. This may happen when some household characteristics such as risk aversion, family ambition, social network, etc., affect access to both migration and non-farm business. For example, Heimueller (2005) finds that less risk-averse individuals are more likely to engage in migration. Kihlstrom and Laffont (1979) explain that less risk-averse individuals are more likely to embrace a successful start in business. One way to deal with endogeneity problem is to employ instrumental variables (IV): per-capita durable goods ($PCDURABLES$) and house ($PCHOUSE$) owned by households, and proportion of illiterate family members ($PROILLIT$).

The latent variable models (2) and (3) yield the probit model if $\epsilon_{i,t}$ follows standard normal distribution. The probit model estimation results for regression (2) are presented in Table III. Columns (1)-(2) provide conditional estimation, while columns (3)-(4) unconditional. In the context of this paper, "conditional" means an estimation is conducted on the subset of rural households who had positive migration income last period; "unconditional" means an estimation is done for all rural households. Furthermore, probit estimation with and without instrument variables are conducted in both conditional and unconditional

estimation.

The results illustrate that migration income increases the probability of starting non-farm business. For the subset of households with earnings from migration activities, the coefficient estimates for the lagged migration income are 0.140 and 0.262 depending on whether instrument variables are employed. This finding suggests that higher migration income raises the probability of entering non-farm business. In other words, for rural agents facing borrowing constraints, income from rural-urban migration offers more opportunities for business start-ups. On the other hand, if we apply the same technique for all rural households, then the same coefficient estimates become much smaller. This is because not all rural households participated in migration activities and received migration income. Besides migration income, other significant estimates include farm income, education, and family location. Higher farm income from the previous period also help increase the probability of entering non-farm business. Households with longer schooling years are more likely to enter non-farm business, suggested by the positive coefficient estimates ranging from 0.047 to 0.059. Comparing households residing in inland and coastal provinces, the latter have a higher probability of entering non-farm business, with the coefficient estimates ranging from 0.096 to 0.134.

3.2 Probit Model of Being in Non-farm Business

The second task is to examine whether migration income increases the probability that households are in non-farm business in period t. While the first task focuses on households starting business in period t, the second task studies households in business in period t no matter whether they were in business prior to t or not. The underlying continuous unobservable (or latent) variable, IN^*_{it} and other covariates satisfy the following:

$$IN^*_{it} = \beta_0 + \beta_1 ln(MIGINC_{i,t-1}) + \beta_2 ln(FARMINC_{i,t-1}) + \beta_3 ln(NFINC_{i,t-1}) + X'_{it}\Theta + u_{it} \tag{4}$$

Although IN^*_{it} is not observed, we do observe

$$IN_{it} = \begin{cases} 0, & \text{if} \quad IN^*_{it} > 0 \quad \leftrightarrow \quad \text{Not in non-farm business in period } t \\ 1, & \text{if} \quad IN^*_{it} \leq 0 \quad \leftrightarrow \quad \text{In non-farm business in period } t \end{cases} \tag{5}$$

$NFINC_{i,t-1}$ represents household income from non-farm business in period $(t-1)$. Assuming the error term u_{it} follows standard normal distribution, we estimate regression (4) by probit estimation. The results are presented in Table IV. For the subset of households with positive migration income, the coefficient estimates for lagged migration income are 0.168 and 0.196 depending on whether instrumental variables are applied. Therefore, higher migration income last period raises the probability of households being in non-farm business this period. The coefficient estimates for the lagged farm income are negative, ranging from -0.276 to -3.000; the coefficient estimates for the lagged non-farm income are positive, ranging from 0.198 to 0.213. Lastly, the coefficient of location is estimated to be positive and between 0.282 to 0.397, suggesting that households from coastal areas are much more likely to own non-farm business than those residing in inland China.

3.3 Regression Model of Non-farm Business Income

The third task is to examine whether migration income in period $(t-1)$ helps increase non-farm business income in period t. The structural equation describing this relationship is:

$$ln(NFINC_{it}) = \gamma_0 + \gamma_1 ln(MIGINC_{i,t-1}) + \gamma_2 ln(FARMINC_{i,t-1}) + \gamma_3 ln(NFINC_{i,t-1}) + X'_{it}\Gamma + e_{it}, \quad (6)$$

The estimation results are presented in Table V. Both OLS and IV methods are applied in conditional and unconditional estimations. Since logarithmic transformation has been taken on all income variables, we can interpret the estimation results in percentage terms. For rural households earning migration income in the previous period, a 1% increase in migration income from $(t-1)$ raised non-farm business income by 0.288% without instrumental variables and by 1.575% with instrumental variables. This confirms that rural-urban migration enhances the development of rural non-farm business. If we look at all rural households, then the estimated coefficients for migration income is much smaller because not all rural households had migration income. The effect of farm income in period $(t-1)$ on non-farm business income in period t is negative with a small magnitude: a 1% increase in farm income from the pervious period is estimated to decrease non-farm business income by 0.087%. Non-farm business income from the previous period is estimated to have a positive effect on the current business income with the estimated coefficients varying from 0.09 to 0.371 depending on estimation specifications. Education continues to show its importance for non-farm business: one more year of education improves non-farm business income by 4.0-6.4%. Number of labor has negative effect on non-farm business earnings: one more labor in the household decreases non-farm business income by 17.4-39.1%. Lastly, compared with households in inland areas, those in coastal areas enjoy higher income from non-farm business by 38.6-106.6%.

4 Concluding Remarks

Since China's economic reform in 1978, more and more rural individuals have joined the army of migrant workers, migrating to urban areas to work while maintaining strong social connections with their rural hometown. Due to restrictions from household registration system, and in addition, because of social and family connections with rural hometown, most migrant workers travel back and forth between rural and urban areas. Therefore, a lot of rural households earn migration income in addition to income from local farm and/or non-farm business sectors. Such migration income provides an extra funding channel through which rural agents overcome borrowing constraint and enter rural non-farm business, especially in the credit deprived rural areas. Through an empirical study of rural household survey data from 1995 to 1999, this paper provides evidences for the positive effects of migration income on the development of rural non-farm business.

Both probit model and panel regression model are estimated with instrumental variable method. There are three main findings: first, migration income from last period enhances the probability of starting non-farm business this period. Second, migration income from

last period increases the probability of rural households being in rural non-farm business this period, regardless of whether the business is a start-up or not. Third, migration income has a strong positive effect on non-farm business income: a 1% increase in migration income last period improves non-farm business income this period by 0.288-1.506%. These findings confirm that rural-urban migration provides a vital capital source for rural households. Therefore, policies promoting rural-urban labor mobility not only accelerate the urbanization progress, but also indirectly support the development of rural non-farm business and facilitate poverty reduction in rural China.

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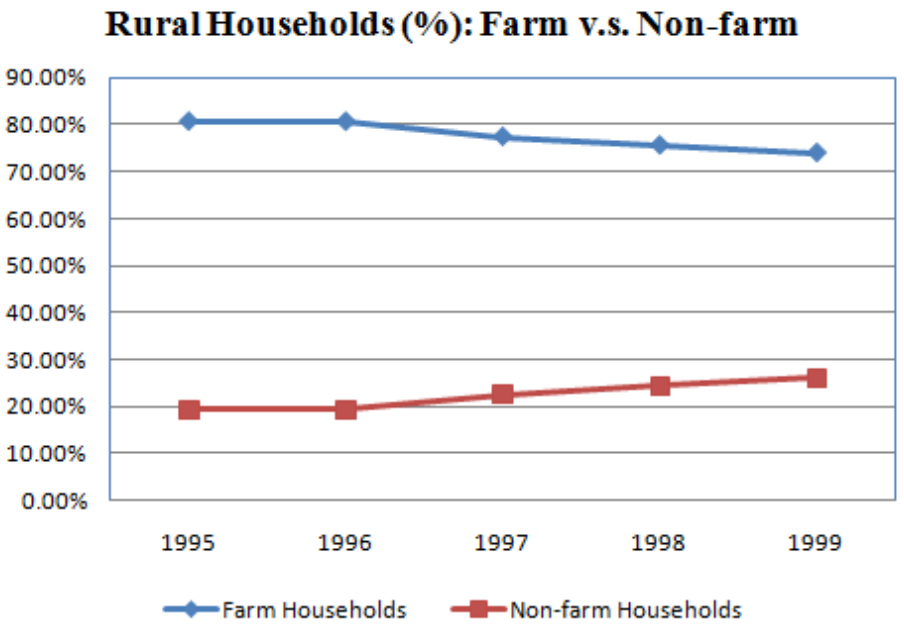

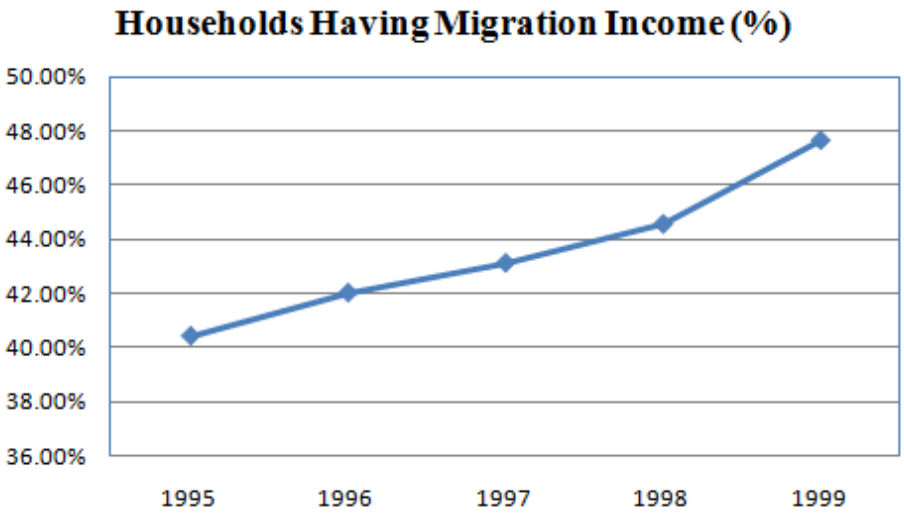

Figure 1: Farm and Nonfarm Employment, Migration, 1995-99

Table I: Variable Definitions and Summary Statistics

Name	Definition	Mean	Std. Dev
NUMLABOR	Number of labor in household	2.61	1.10
FRACMALE (%)	Fraction of male family members	54.17	21.39
EDUCATION (%)	Percentage of family members		
Illiterate	with no education	15.29	25.98
Elementary	with elementary education	40.06	33.73
Secondary	with secondary education	37.08	33.58
High school	with high school education and above	7.55	19.41
PCDURABLES (Yuan)	Per-capita owning of durable goods	1601.24	3733.28
PCHOUSE (Yuan)	Per-capita owning of houses	5735.43	13484.12
PCDPST (Yuan)	Per-capita deposit in banks	2115.05	32383.7
COASTAL	Residing in coastal provinces? $(Y = 1, N = 0)$	0.27	0.44
FARMINC (Yuan)	Income from farm sector	1663.32	1995.17
Farm households		1827.64	1439.40
Nonfarm households		829.24	1086.56
NFINC (Yuan)	Income from non-farm sector	1258.09	6140.08
Farm households		451.57	2439.13
Nonfarm households		4454.42	7107.82
MIGINC (Yuan)	Income from migration activities	968.17	3074.31
Farm households		865.36	1555.70
Nonfarm households		1268.92	3657.44

Table II: Correlations between Different Sources of Income

Income Source	Farm	Nonfarm	Migration
Farm	1.0000		
Nonfarm	-0.1456	1.0000	
Migration	-0.1442	0.3394	1.0000

Table III: Probit Model of *Entering* Non-farm Business

	Conditional		Unconditional	
	(1)	(2)	(3)	(4)
	PROBIT	IV PROBIT	PROBIT	IV PROBIT
INTERCEPT	-2.688***	-3.566***	-1.879***	-1.831***
	(0.215)	(0.654)	(0.093)	(0.162)
ln(MIGINC (t-1))	0.140***	0.262**	0.011**	-0.015
	(0.022)	(0.090)	(0.004)	(0.062)
ln(FARMINC (t-1))	0.025*	0.042*	0.028***	0.024*
	(0.012)	(0.017)	(0.008)	(0.012)
ln(PCDPST(t-1))	-0.008*	-0.015*	-0.006	-0.005
	(0.005)	(0.007)	(0.003)	(0.004)
EDUCATION	0.010	0.003	0.014**	0.017**
	(0.009)	(0.010)	(0.005)	(0.005)
FRACMALE	-0.047	-0.076	0.043	0.057
	(0.100)	(0.101)	(0.062)	(0.070)
NUMLABOR	-0.011	0.001	-0.001	0.015
	(0.017)	(0.019)	(0.012)	(0.042)
COASTAL	0.096*	-0.002	0.119***	0.134**
	(0.045)	(0.084)	(0.029)	(0.046)
Instruments	–	PCDURABLES	–	PCDURABLES
	–	PCHOUSE	–	PCHOUSE
	–	PROILLIT	–	PROILLIT
Observations	9866	9866	22201	22201
LR chi2	74.63	–	42.60	–
Wald chi2	–	43.12	–	37.89
Prob>chi2	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table IV: Probit Model of *Being* in Non-farm Business

	Conditional		Unconditional	
	(1)	(2)	(3)	(4)
	PROBIT	IV PROBIT	PROBIT	IV PROBIT
INTERCEPT	-1.000***	-1.203	0.086	0.195
	(0.201)	(0.732)	(0.083)	(0.191)
ln(MIGINC (t-1))	0.168***	0.196*	0.000	-0.041
	(0.021)	(0.099)	(0.004)	(0.065)
ln(FARMINC (t-1))	-0.280***	-0.276***	-0.294***	-0.300***
	(0.010)	(0.018)	(0.007)	(0.009)
ln(NFINC (t-1))	0.199***	0.201***	0.213***	0.198***
	(0.006)	(0.007)	(0.004)	(0.028)
ln(PCDPST (t-1))	0.006	0.004	0.008*	0.008**
	(0.005)	(0.007)	(0.003)	(0.003)
EDUCATION	0.006	0.003	0.019***	0.026***
	(0.008)	(0.010)	(0.005)	(0.005)
FRACMALE	-0.015	-0.023	-0.016	0.012
	(0.096)	(0.099)	(0.058)	(0.072)
NUMLABOR	-0.031*	-0.029	-0.019	0.010
	(0.016)	(0.018)	(0.011)	(0.047)
COASTAL	0.305***	0.282**	0.353***	0.397***
	(0.042)	(0.093)	(0.026)	(0.069)
Instruments	–	PCDURABLES	–	PCDURABLES
	–	PCHOUSE	–	PCHOUSE
	–	PROILLIT	–	PROILLIT
Observations	9356	9356	21004	21004
Pseudo R2	0.3299	–	0.3562	–
LR chi2	2912.91	–	8190.26	–
Wald chi2	–	2099.05	–	6674.96

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table V: Panel Regression Model of Business Income

	Conditional		Unconditional	
	(1)	(2)	(3)	(4)
	OLS	IV	OLS	IV
INTERCEPT	4.214***	-4.579***	6.374***	5.121***
	(0.295)	(1.241)	(0.121)	(0.229)
ln(MIGINC (t-1))	0.288***	1.575***	-0.012**	0.357***
	(0.030)	(0.174)	(0.004)	(0.082)
ln(FARMINC (t-1))	-0.087***	0.049	-0.093***	-0.112***
	(0.018)	(0.030)	(0.008)	(0.012)
ln(NFINC (t-1))	0.090***	0.203***	0.086***	0.371***
	(0.008)	(0.012)	(0.005)	(0.033)
ln(PCDPST (t-1))	0.037***	-0.012	0.028***	0.037***
	(0.008)	(0.012)	(0.004)	(0.006)
EDUCATION	0.061***	-0.020	0.064***	0.040***
	(0.015)	(0.024)	(0.008)	(0.010)
FRACMALE	-0.042	-0.296	0.072	-0.169
	(0.156)	(0.177)	(0.082)	(0.107)
NUMLABOR	-0.174***	-0.051	-0.176***	-0.391***
	(0.025)	(0.029)	(0.016)	(0.057)
COASTAL	0.860***	0.422*	1.066***	0.386***
	(0.080)	(0.178)	(0.050)	(0.095)
Instruments	–	PCDURABLES	–	PCDURABLES
	–	PCHOUSE	–	PCHOUSE
	–	PROILLIT	–	PROILLIT
Observations	3397	3397	9478	9478
Wald chi2	739.846	1039.795	1727.174	3216.248
R^2_{overall}	0.3134	0.2184	0.3228	0.1775

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$