NON-FARM EMPLOYMENT AND HOUSEHOLD INCOME: A CASE STUDY OF HANOI'S PERI-URBAN AREAS

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ABSTRACT

This paper investigates the relationship between non-farm employment and household income in Hanoi's peri-urban areas. The findings showed that the vast majority of the sample households participate in non-farm activities and income from these sources mainly contributes to total household income. Factors affecting household income were examined using multiple regression models and the findings confirm the important role of non-farm employment in improving household income. In addition, some other asset-variables such as education, access to credit, farmland and productive assets were found to have positive effects on household income. Based on the empirical results, this paper proposes some policy implications that may help households improve their income.

Keywords: Informal and formal wage work, household income, non-farm participation.

Việc làm phi nông nghiệp và thu nhập của nông hộ: Trường hợp nghiên cứu vùng ngoại thành Hà Nội

TÓM TẮT

Bài viết nghiên cứu mối quan hệ giữa việc làm phi nông nghiệp và thu nhập hộ gia đình vùng ven đô Hà Nội. Kết quả chỉ ra rằng phần lớn các hộ gia đình trong mẫu khảo sát tham gia vào hoạt động kinh tế phi nông nghiệp và thu nhập từ hoạt động này đóng góp phần lớn cho thu nhập của các hộ. Các nhân tố tác đông tới thu nhập hộ gia đình được nghiên cứu bằng việc sử dụng mô hình hồi quy đa biến và kết quả đã khẳng định tầm quan trọng của việc làm phi nông nghiệp trong việc nâng cao thu nhập hộ gia đình. Bên cạnh đó, chúng tôi phát hiện rằng một vài biến số khác như giáo dục, tiếp cận tín dụng, đất đai và tài sản sản sản xuất có tác động tích cực tới thu nhập hộ gia đình. Dựa vào kết quả thực nghiệm, bài viết đề xuất một vài hàm ý chính sách có thể giúp nâng cao thu nhập của hộ gia đình.

Từ khóa: Tham gia phi nông nghiệp, thu nhập hộ gia đình, việc làm công phi chính thức và chính thức.

1. INTRODUCTION

Literature on rural non-farm employment has indicated the importance role of non-farm employment in the income generation of rural households in developing countries. Income from rural non-farm activities accounted for between 20 and 75 percent of total income with an average of about 47 percent in developing countries (Carletto et al., 2007). In Vietnam rural areas, the non-farm sector has been increasingly important in the past decade. The share of non-farm employment increased from 20 percent in 2001 to 40 percent of the total employment in 2011 and around 37 percent of total rural households earned their main income from non-farm sources (GSO, 2011). Econometric evidence has shown that rural non-farm participation is a determinant of poverty reduction and household welfare in Vietnam (Pham ey al., 2010; Van de Walle & Cratty, 2004). Van de Walle and Cratty (2004) found that the probability of falling into poverty is substantially higher among households who

do not participate in non-farm self-employment activities. Moreover, as estimated by Pham et al. (2010), on average and *ceteris paribus*, the shift of a household from pure agriculture to pure non-agriculture raises expenditure per capita, and this outcome tends to steadily increase over time. Therefore, promoting rural non-farm activities and supporting the poor's access to these are important factors in rural poverty alleviation in Vietnam (Pham et al., 2010; Van de Walle & Cratty, 2004).

Agricultural land is of great importance to the livelihood of the majority of the Vietnamese rural population, especially unskilled labourers. In 2011, about 60 percent of the labour force was engaged in agriculture, of which 11.2 percent were skilled workers (GSO, 2011). Increasing urban population and rapid economic growth, particularly in the urban areas of Vietnam's large cities, have resulted in a great demand for urban land. As a result, there has been an intensive conversion of agricultural land into higher value nonagricultural land, especially in the urban peripheries. In the 1993-2008 period, about half a million hectares of farmland were converted to urban, industrial or commercial land (WB, 2011a). This has led to lack of productive land, which, in turn, can have a major effect on household livelihood in Vietnam's rural and peri-urban areas (ADB, 2007). Under such a circumstance, rural non-farm employment is expected to provide an important source of employment and income for landless and near landless households.

One strand of the literature has investigated household welfare as a function of access to off-farm activities (Van de Walle & Cratty, 2004). Following this approach, this paper looks at household income as a function of non-farm participation, share of time for different non-farm activities and household assets. Thus, two hypotheses are tested in this study. First, households with at least one non-farm activity are hypothesized to have a higher per capita household income level than purely agricultural households. Second, per capita household income is hypothesized to be positively associated with the time proportions for various non-farm activities. As mentioned above, while much has been discussed about the important role of nonfarm employment in household income in Vietnam's rural areas, no econometric evidence of this role in peri-urban areas has been provided thus far. Our study, therefore, is the first attempt to examine the role of rural non-farm employment in household income in Hoai Duc, a peri-urban district of Hanoi, which has been experiencing a massive farmland conversion for urbanisation and industrialisation in recent years. The overall objective of this study is to contribute to the understanding of income-generating activities, important sources of income amongst households and the factors affecting their income in Hanoi's peri-urban areas. The paper is structured as follows: the next section describes the context of the study district, followed by the data collection and analysis in Section 3. Section 4 reports results and discussions, and followed by the conclusion and policy implications in Section 5.

2. DESCRIPTION OF THE STUDY AREA

Hoai Duc is located on the northwest side of Hanoi, 19 km from the Central Business District (CBD) (WB, 2011b). Hoai Duc was selected for our research because the district has the biggest number of land acquisition projects and has been experiencing a massive conversion of farmland to non-farm uses (Huu Hoa, 2011). The district has an extremely favourable geographical position, surrounded by various important roads, namely Thang Long highway (the country's biggest and most modern highway) and National Way 32, and is in close proximity to industrial zones, new urban areas and Bao Son Paradise Park (the biggest entertainment and tourism complex in North Vietnam). Consequently, a huge area of agricultural land in the district has been taken

for the above-mentioned projects in recent years. In the period 2006-2010, around 1,560 hectares of farmland were acquired for 85 projects (Hà Nội Mới, 2010). The average size of farmland per household in the district was about 840 m^2 in 2009 (Statistics Department of Hoai Duc District, 2010), which was much lower than that in Ha Tay Province (1,975 m^2) and much smaller than that of other provinces (7,600 m^2) in 2008 (Central Institute for Economic Management (CIEM), 2009).

Hoai Duc was merged into Hanoi City on the 1st of August 2008. The district occupies 8,247 hectares of land, of which agricultural land accounts for 4,272 hectares and 91 percent of this area is used by households and individuals (Hoai Duc District People's Committee, 2010a). There are 20 administrative units under the district, including 19 communes and one town. Hoai Duc has around 50,400 households with a population of 193,600 people. In the whole district, employment in the agricultural sector dropped by around 23 percent over the past decade. Nevertheless, a significant proportion of employment has remained in agriculture, accounting for around 40 percent of the total employment in 2009. The corresponding figures for industrial and service sectors are 33 and 27 percent, respectively (Statistics Department of Hoai Duc District, 2010).

3. DATA COLLECTION AND ANALYSIS

3.1. Data collection

Data for this paper were drawn from our own household survey in Hoai Duc District. Adapted from General Statistical Office (GSO) (2006), a household questionnaire was designed for the survey to gather quantitative data on household livelihood assets (human, social, financial, physical and natural capitals), economic activities (time allocation data) and household income. First, six communes were randomly selected. Then from each of these communes, 100 households, including 20 households for reserves, were randomly selected, for a target sample size of 480 households. The survey was carried out from April to June 2010 and 477 households were successfully interviewed.

3.2. Statistical analysis

The main statistical analyses applied were descriptive statistics and multiple regression. The regressions were used to analyze relationships between per capita household income; non-farm participation; share of time for various non-farm activities; household demographics and asset-related variables. Specifically, several explanatory variables were selected as being important to household income (see more in Appendix 1). These were (i) household size, dependency ratio, number of male working members, age of household head, average age of working members, average education of working members; (ii) total number of group memberships; (iii) owned farmland size per adult; (iv) the log of total values of all productive assets per working members (capital-labour ratio); (v) two dummy variables of access to formal and informal credit; (vi) participation in at least on non-farm activity (dummy variable) and (vii) proportions of time for various non-farm activities. (viii) and commune dummy variables were included in the model to control for fixed commune effects. We ran two models with all the same explanatory variables except non-farm participation in Model 1 and time proportions for different non-farm activities in Model 2. During the estimation of these two models, it was found that there is no harmful multicollinearity; however, heteroscedasticity was present. We addressed this issue by transforming income per capita and capital-labour ratio into their natural logarithms.

Model 1: Per capita household income

$= \boldsymbol{\beta_1}$demographics + $\boldsymbol{\beta_2}$group memberships + $\boldsymbol{\beta_3}$farmland per adult + $\boldsymbol{\beta_4}$capital-labour ratio + $\boldsymbol{\beta_5}$credit + $\boldsymbol{\beta_6}$communal dummies + $\beta_7$nonfarm participation + ε

Model 2: Per capita household income

= $\beta_1$demographics + $\beta_2$group memberships + $\beta_3$farmland per adult + $\beta_4$capital-labour ratio + $\beta_5$credit + $\beta_6$communal dummies + $\beta_7$informal wage work + $\beta_8$formal wage work + $\beta_9$nonfarm self-employment + ε

Having more family members and a higher dependency ratio are expected to reduce income per capita. Higher education levels of working members are expected to increase household income. However, it is uncertain about expected signs of age of household head and working members. Younger members are more likely to engage in non-farm activities, which in turn results in higher income. Nevertheless, older members tend to have more work experience and, therefore, can access to lucrative job opportunities, leading to higher income. Household with more group memberships may have a better access to credit, information and other productive resources, which can increase income. More farmland per adult is expected to have a positive effect on income. Higher capital-labour ratios are also expected to increase income. Households with access to any kind of credits are expected to have a higher income level. Finally, households that participate in at least one non-farm activity were hypothesized to have a higher income level than purely agricultural households. Time shares for various non-farm activities, including informal wage work, formal wage work and non-farm self-employment, were also hypothesized to have a positive impact on income per capita.

4. RESULTS AND DISCUSSION

4.1. Background on household income components and non-farm participation

Table 1 provides background information about household and per capita income by source. In addition, it indicates the extent to which income sources contribute to total household income in the sample. According to the survey data, annual per capita household income reached around 14,147,000 VND, which was slightly lower than that of the whole district in 2009 (Hoai Duc District People's Committee, 2010b)[1]. The results show that the overwhelming majority of surveyed households (around 84 percent) derived income from farming, which, however, only accounted for about 27 percent of total income and around 30 percent of total time on average. This suggests farming has remained important in terms of food security and cash income to some extent. Many households have continued rice cultivation as a source of food supply while others produced vegetables and fruits to supply Hanoi's urban markets. The common types of crop plants consisted of cabbages, tomatoes, water morning glory and various kinds of beans, and fruit trees including oranges, grapefruits and guavas, among others. Animal husbandry was mainly undertaken as pig or poultry breeding on small-size farms or cow grazing. These activities, however, have declined considerably due to the spread of cattle diseases in recent years.

Almost all surveyed households (90 percent) participated in at least one non-farm activity and income from non-farm sources contributed about two thirds of total income on average. Among these activities, informal wage income accounted for about one fourth of total income and around 27 percent of total time. In addition, around 40 percent of the household sample participated in informal wage work. This income source was often earned from manual labour jobs. The occupations most commonly found included carpenters, painters, building workers and various kinds of casual jobs. Such workers were often hired by individuals or households, providing low and unstable incomes, with no formal labour contracts. Those who undertook these jobs had below-average education and were younger than farmers. Similar figures were observed for non-farm self-employment income. About 41 percent of the household sample reported engaging in non-

[1] According to this document, the annual per capita income in 2009 reached 15,000,000 VND.

Table 1. Composition of household income and participation rate in activities

Income sources	Annual income per household (1,000 VND)		Annual per capita household income (1,000 VND)		Share of total income (%)	Share of total time (%)	Participation rate (%)
Farm work	14,046	(16,502)	3,282	(4,187)	27.14	30.27	84
Nonfarm self-employment	15,561	(26,478)	3,827	(6,495)	24.13	25.20	40
Informal wage work	12,035	(18,399)	2,793	(4,228)	24.04	26.90	41
Formal wage work	14,555	(28,973)	3,092	(6,322)	17.89	17.63	28
Other income	3,491	(8,849)	1,153	(3,233)	6.80		33
Total	59,688	(31,156)	14,147	(7,345)	100	100	

Note: Values in parentheses are standard deviation. 1 USD equated to about VND18,000 in 2009.
Source: Calculation from authors' survey. N=477.

farm household businesses, and on average around 24 percent of total income and 25 percent of total time were contributed by this activity. Such businesses tended to be small-scale trade or production units, using family labour. The households' business premises were mainly located at their own houses or residential land plots that had a prime location for opening a shop, a workshop or a small restaurant. About 28 percent of sample households received income from formal wage work. This work contributed around 18 percent of total income and accounted for about 18 percent of total time on average. Formal wage earners were often employees who worked in enterprises and factories, state offices or other organisations. Such jobs were often highly paid with stable incomes and formal labour contracts. Those undertaking these jobs tended to have a much higher education level and were younger. Finally, about one third of surveyed households received other income, but this source only contributed 6.8 percent of total income on average.

4.2. Determinants of household income

Table 2 reports the results from Model 1 with non-farm participation and Model 2 with time proportions for various non-farm activities. The results indicate that both models explain roughly 50 percent of the variation in household income. In addition, many coefficients are highly statistically significant ($P<0.05$) with their signs as expected. As shown in Model 1, the coefficient of non-farm participation indicates that, holding all other variables constant, households with at least one non-farm activity will, on average, have an income per capita level approximately 20 percent higher than those without any non-farm activity. This suggests that households can improve their income by moving from a purely agricultural livelihood to a pure non-farm or diversified livelihood. This finding is also in accordance with that of Pham et al. (2010) and Van de Walle and Cratty (2004). The coefficients of time share for non-farm activities in Model 2 show that there is a strong positive association between the intensity of participation in non-farm activities and household income. A 10 percentage-point increase in time for formal wage work will lead to an increase in income per capita of around 5.5 percent, holding all other variables constant. The figures for non-farm self-employment and informal wage work are around 4.5 percent and 3.3 percent, respectively. These results imply that households can increase their living standard by intensively participating in non-farm activities. Of these non-farm activities, formal wage work appears to be the most remunerative one, followed first by non-farm self-employment and lastly by informal wage work.

Table 2. Determinants of household income
(Natural logarithms of monthly income per capita)

Explanatory variables	Model 1		Model 2	
	Coefficient	Se	Coefficient	Se
Non-farm participation	0.1953***	(0.051)		
Time share for non-farm self-employment			0.4516***	(0.073)
Time share for formal wage work			0.5485***	(0.089)
Time share for informal wage work			0.3279***	(0.066)
Household size	-0.1612***	(0.013)	-0.1508***	(0.012)
Dependency ratio	-0.0764***	(0.027)	-0.0968***	(0.027)
Number of male working members	0.0602**	(0.029)	0.0548**	(0.027)
Household head's gender	0.0053	(0.043)	0.0213	(0.042)
Household head's age	0.0023	(0.002)	0.0027	(0.002)
Average age of working members	-0.0001	(0.003)	0.0010	(0.002)
Average schooling years of working members	0.0546***	(0.008)	0.0370***	(0.002)
Owned farmland per adult	0.0204***	(0.007)	0.0319***	(0.007)
Log of total value of all productive	0.1240***	(0.016)	0.1182***	(0.016)
Assets per working member				
Access to formal credit	0.0926**	(0.037)	0.1104***	(0.036)
Access to informal credit	-0.0498	(0.040)	-0.0336	(0.038)
Commune				
Song Phuong	0.1176*	(0.068)	0.1188*	(0.066)
Kim Chung	0.2817***	(0.060)	0.2367***	(0.057)
An Thuong	0.0366	(0.062)	0.0200	(0.058)
Duc Thuong	0.0745	(0.058)	0.1020*	(0.056)
Van Con	0.1268**	(0.058)	0.1454**	(0.056)
Constant	5.6611***	(0.208)	5.5893***	(0.219)
Observations	460		460	
Prob > F	0.0000		0.0000	
Adjusted R^2	0.5054		0.5511	
R^2	0.5237		0.5697	

*Note: Robust standard errors (Se) in parentheses. *, **, *** statistically significant at 10%, 5% and 1%, respectively.*

All other coefficients in the two models have the same signs and statistical significances and nearly similar magnitudes, apart from the coefficient of Duc Thuong. Both household size and dependency ratio are negatively related to income per capita. The finding is consistent with Jansen et al. (2006), who found that having more dependent members, and more family members in general, seems to reduce per capita income. Holding all other variables constant, an additional male working member corresponds with an increase in income per capita of 6 percent in Model 1 and 5.5 percent in Model 2. Education level of working members also has a positive effect on income per capita. A one year increase in working members' schooling years will lead to an increase in income per capita of around 5.5 percent in Model 1 and 3.7 percent in Model 2. Farmland also has a positive impact on household welfare. However, such an impact seems to be quite small. An additional 100 m^2 of

farmland per adult will result in an increase in per capita income of 2 percent in Model 1 and around 3.3 percent in Model 2.

This study found statistical evidence for a significantly positive association between access to formal credit and household welfare. Similar evidence was not found in the case of informal credit. The capital-labour ratio is also highly associated with a higher level of wellbeing. The elasticity of income per capita to higher values of capital-labour ratio is around 0.12 in both models. Finally, all coefficients of the communal dummy variables in both models have the same signs and statistical significance except for Duc Thuong. These variables indicate that households with equal livelihood assets and other characteristics will, on average, have income per capita levels that are higher in Song Phuong, Kim Chung and Van Con than in Lai Yen. The disparities in wellbeing across communes suggest that household welfare is considerably affected by communal factors.

5. CONCLUSIONS AND POLICY IMPLICATIONS

The objective of this paper is to examine the links between non-farm employment and household welfare in Hanoi's peri-urban areas. Using micro data from a household survey in Hanoi's peri-urban areas, our regression analysis confirms the importance of rural non-farm activities in the livelihood of peri-urban households. This also suggests that previous studies using secondary data, which only focus either on rural areas or the whole country, might not have assessed adequately the importance of non-farm activities in Vietnam's peri-urban areas.

Our econometric evidence shows a strong positive association between non-farm employment and household welfare. Both participation and intensity of participation in non-farm activities have positive effects on income per capita. A useful policy implication here is that land-limited households can improve their living standard by intensively taking up non-farm activities, given the context of farmland shrinking due to rapid urbanization in Vietnam's peri-urban areas. Nevertheless, the ability to access to non-farm activities was found to be determined by some important factors such as land (farmland and a plot of land in prime location for doing businesses), age and education of working members, households' access to formal credit and improved local infrastructure (Tuyen et al., 2012). The accumulation, value, usefulness of and access to these factors can be greatly affected by institutions and state policies. As a result, policy intervention in these factors can improve household wellbeing by providing favourable conditions for livelihood transition and diversification and/or pushing households towards lucrative non-farm activities.

Our regression analysis indicates that some other variables have a positive relationship with household welfare. Higher levels of education, productive assets and access to formal credit all have a positive effect on income per capita. Therefore, a possible implication here is that governmental support for households' access to formal credit can help them have more financial resources and accumulate more productive assets, these, in turn, allow them to earn higher income. Encouraging investment in children's education will be a way to seize remunerative job opportunities for the next generation.

As previously discussed, although farmland has a positive effect on household income, its impact is quite small. For households whose livelihoods largely depend on agricultural production, their income may be significantly decreased due to the loss of farmland caused by urbanization in the near future. Thus, it may be useful for them to learn successful experiences in farming transitions from some other localities in Hanoi. For instance, in the Tu Liem peri-urban area, Tay Ho and Hoang Mai urban districts, farm households have gained much benefit by shifting from cultivation of staples to higher value products such as fresh vegetables, flowers and ornamental plants (Lee et al., 2010). Therefore, agricultural extension polices that assist farmers to change to more profitable crop plants should be of practical use.

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Appendix 1. Summary statistics of explanatory variables

Explanatory variables	Definition	Mean	Std	Min	Max
Non-farm participation	Whether or not the household participated in at least one non-farm activity.	0.89	0.31	0	1
Time share for non-farm self-employment	Time share that households allocated for non-farm self-employment in the last 12 months	0.25	0.35	0	1
Time share for formal wage work	Time share that households allocated for formal wage work in the last 12 months.	0.18	0.32	0	1
Time share informal wage work	Time share that households allocated for informal wage work in the last 12 months.	0.27	0.36	0	1
Household size	Total household members.	4.50	1.62	1	11
Dependency ratio	This ratio is calculated by the number of household members aged under 15 and over 59, divided by the number of household members aged 15-59.	0.60	0.65	0	3
Age of household head	Age of household head	51.35	12.60	21	96
Gender of household head	Whether or not the household head is male	0.78	0.41	0	1
Age of working members	Average age of adult members who were employed in the last 12 months.	40.73	9.12	21.5	78
Education of working members	Average years of schooling of adult members who were employed in the last 12 months.	8.17	2.95	0	16
Farm land per adult (100 m^2)	Owned farmland per member aged 15 and over.	3.01	2.51	0	18.33
Capital-labour ratio	Log of total value of productive assets per working member.	8.57	1.15	4.94	11.25
Access to formal credit	Receiving any loan from banks or credit institutions in the last 24 months.	0.26	0.43	0	1
Access to formal credit	Receiving any loan from friends, relatives or neighbours in the last 24 months.	0.20	0.40	0	1

Source: Own calculation from authors' survey.