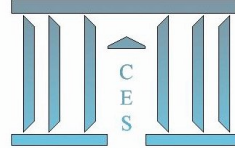


Documents de Travail du Centre d'Économie de la Sorbonne

C
E
S
W
o
r
k
i
n
g
P
a
p
e
r
s



Determinants of self-employment : the case in Vietnam

Thi Quynh Trang DO, Gérard DUCHENE

2008.38



CENTRE NATIONAL
DE LA RECHERCHE
SCIENTIFIQUE

Determinants of self-employment: the case in Vietnam

T.Q. Trang Do*, Gérard Duchêne†

Septembre 12 , 2007

*PhD candidate at CES (Centre d'économie de la Sorbonne), University of Paris 1 Panthéon-Sorbonne, CNRS, 112-116 bd. de l'Hôpital, 75647 Paris, Cedex 13 , France, Email: dootrang@yahoo.com, Thi-Quynh-Trang.Do@malix.univ-paris1.fr

†Professor of University, CES, University of Paris 1 Panthéon-Sorbonne, CNRS, 112-116 bd de l'Hôpital, 75647 Paris, Cedex 13 , France, Email: Gerard.Duchene@univ-paris1.fr

Abstract

The determinants of self-employment are widely studied in the economic literature in recent twenty years. However, in the case of Vietnam where self-employed population takes an important proportion in workforce, it remains an under researched area. By using the data from the Vietnam Household Living Standard Survey 2004 (VHLSS2004), this paper aims to provide clearer insights into this area. We use the Heckman method to determine the level and identify the factors that affect the workers' choice between self-employment and wage employment in Vietnam. We emphasize the role of expected earnings differential in workers' decision making. Comparisons between female and male workers are made. Our empirical results show that there exist a number of determinants that permit to construct the pattern of self-employed as well as salary workers in Vietnam. Regardless of educational attainment, experiences and familial background, perspective of having higher earnings plays an important role in choice behavior of workers.

Keywords: Occupational choice, earnings, self-employment, entrepreneurship, informal sector, Vietnam.

JEL classification: D21; J24; M13, O17.

Abstract

Les déterminants du travail indépendant sont largement étudiés dans la littérature économique depuis une vingtaine d'années. Cependant, dans le cas du Vietnam, là où les travailleurs indépendants s'occupent une part importante de la main d'oeuvre, cette question est encore moins mentionnée. En exploitant des données de l'enquête du niveau de vie du ménage du Vietnam en 2004 (VHLSS2004), ce papier a pour but de mieux éclairer le secteur de travail indépendant. Nous recourons à la méthode Heckman en identifiant les facteurs et leurs impacts sur le choix entre travail indépendant et salarié au Vietnam. Nous mettons l'accent sur le rôle de l'écart de revenus dans la décision des travailleurs. La comparaison entre hommes et femmes est faite. Nos résultats empiriques montrent qu'il existe quelques déterminants qui permettent de caractériser les travailleurs indépendants et en plus les salariés au Vietnam. A côté du niveau de l'éducation, de l'expérience et des caractéristiques de la famille, la perspective d'avoir un revenu plus élevé joue un rôle d'important dans le choix des travailleurs.

Keywords: Choix d'occupation, revenu, travail indépendant, entrepreneuriat, secteur informel, Vietnam.

JEL classification: D21; J24; M13, O17.

1 Introduction

The reform economic in Vietnam has seen the private entrepreneurship emerge as one of the forces behind the rapid poverty reduction and the acceleration of growth. In fact, roughly every household in Vietnam has run a non-farming business of one kind or others. These small enterprises have constituted an effective tool in combating unemployment and creating welfare. Along with a vast number of household businesses, saying rather informal ones, there is a boom of registered enterprises. The number of private formal enterprises has quadrupled during 1999 to 2005. Survey's analysis show that many registered firms have been "upgraded" from household businesses while others have been registered by persons who have been working illegally or unofficially in the same industry for years.

In the perspective that the development of small successful enterprises will provide the beginning of Giant Corporation, many policies which aim at encouraging the private entrepreneurship development have been carried out in Vietnam in recent years. Providing the fact that good knowledge on the sector allows policy makers to give more suitable supports to promote the growth of private business, therefore the sector has drawn many researchers. However, in spite of paying much attention to this business sector, the question of who are the leaders of these businesses remains an under-research area for the case of Vietnam. The characteristics of self-employed and the motivation of self-employment have been widely mentioned in the economic literature. Nevertheless, most of these studies have been running on the self-employed population of industrialized countries while the case of developing countries might need some particular interpretations.

To our knowledge, the determinants of self-employment in Vietnam have been briefly reported in the research of Vijverberg and Haughton (2002). They draw attention rather on the survival and growth of household enterprises, and then factors that would be important in determining self-employment have been shortly discussed only. By using most recent survey data on households' living standards of 2004, this paper aims at providing more detail discussions on determinants and characteristics of self-employment in Vietnam. Stress is laid on business leader but not on the household as in Vijverberg and Haughton (2002). We focus on the role of expected earnings as the important motivation of self-employment and the aim of investigating the constraint of business starting up. We also attempt to distinguish the effect of different determinants on gender. For that purpose, we separately examine the impact of these factors on each gender.

We organize our paper as follow. Section 2 provides some background information on the labour market of Vietnam. Brief review of literature on occupational choice will be presented in section 3. Section 4 discusses the econometric background method used in this paper. We present in section 5 and 6, descriptive analysis of our data and our estimation results. Finally we conclude in section 7.

2 The private labour market in Vietnam

Before transition, there was no private sector in Vietnam. State sector, including either state-owned enterprises (SOEs) or co-operatives sector existed as formal job-maker. The non-farm self-employment sector however, informally existed but its size was rather small

and there was no statistics on it¹.

Facing with the increase of socio economic crisis, the Government of Vietnam has had to conduct a program of economic reform² in the late 1980s . The private business sector, therefore, has formally seen the light of day around 20 years ago. Together with the arrival of foreign direct investment, the economic structure in general and the labour market structure in particular have gradually changed from then on.

In the first stage of transition, the share of state employment especially that of SOEs declined sharply (McCarty, 1999). In recent years, it has been rather stable and fluctuated around less than 10 per cent (GSO). One must be interested to know why the state sector enlarge in recent years. In fact, the number of worker in production section of state sector has continued to decrease but the development of public services such as health care and education has absorbed many other workers. We can see the labor structure change in the table below. The share of non-state employment contrarily has seen a rapid extension in the first years then stabilized and in recent years lightly decreased of 1 per cent to around 90 per cent of total employed during 2000-2005. It should be noticed that by now, the agriculture remains the sector that absorbs most employment in Vietnam. The farming workers take a higher proportion in the total of non state employment. The foreign investment sector captured more and more labour force since its birth. Its share was 1.6 per cent in 2005 compared with 1 per cent in 2000. These statistics are rather compatible with those in VLSS-2004 that we use in this study.

Table 1: Employed population distribution by Ownership

	2000	2001	2002	2003	2004	2005
State sector	9.3	9.3	9.5	9.9	9.8	9.7
Non-state sector	90.1	89.7	89.4	88.8	88.7	88.8
Foreign investment sector	0.6	0.9	1.1	1.3	1.5	1.6

Statistics from GSO, Vietnam: www.gso.gov.vn

Rapid economic growth has also resulted in job mobility. Unfortunately, we do not have the annual statistics on employed distribution by economic activities for non state sector, but some interesting information could be inferred from the employment distribution by economic activities of all over the country. The share of farmer employment gradually reduced around 10 per cent from 1995 to 2005. We can deduce that the majority of this decline was due to the decrease of agriculture employment in non - state sector because those of state -sector took only less than 1.5 per cent of total agricultural worker. From 1990 to 1997, the share of industrial employment was stagnant at around 10 per cent. From 2000 to 2005, this sector absorbed 2.5 per cent more than previous period. It should be noticed that, this increase was all most due to the development of foreign investment in the same time. Foreign investors have not invested in other sector than industry and services activities. Then no significant increase was found in industrial sector employment of non-state sector in recent years. Nevertheless, the share of non-state

¹See: "The informal economic sector: Realities and problems for the management, Vietnam National University, Hanoi" for more details

²For more details see: Tamara

and non-agricultural employment increased most in service and trade sector. Le & al. (2001) claim that the shift of worker from other sectors to services and trade sector rather than industrial sector caused by lack of capital endowment and business knowledge of entrepreneurs in Vietnam. They prefer small-scale businesses in trade and service, which do not require as much capital endowment as in industry and/or construction.

Table 2: Employed population distribution by kind of economic activities

	2000	2001	2002	2003	2004	2005
Agriculture and forestry	62.5	60.6	58.7	57	55.4	53.3
Fishing	2.6	2.8	3.2	3.3	3.4	3.5
Industry	10.3	11	11.5	12.3	12.7	12.9
Construction	2.8	3.3	3.9	4.2	4.6	5
Trade	10.4	10.5	10.8	11.2	11.5	12.2
Hotels, restaurant	1.8	1.8	1.8	1.8	1.8	1.9
Transport, storage and communications	3.1	3.1	3	2.9	2.9	2.9
Culture, health, education	3.6	3.7	3.8	3.9	4	4.2
Other services	2.9	3.1	3.3	3.5	3.7	4.2

Statistics from GSO, Vietnam: www.gso.gov.vn

The decline in farm employment has been compensated by the increase in the share of wage jobs, relatively minor in the state sector, but considerably in the private sector, including foreign investment sector. By now, household businesses, registered domestic private enterprises and foreign invested companies provide wage employment to more than 22 per cent of employed population (World bank, Vietnam business report, 2006).

Table 3: Employed population distribution by workers' status

	1992	1998	2004
Self-employed farm	66.35	61.07	51.45
Self-employed non farm	15.75	18.45	18.63
Wage employment	17.9	19.48	29.92

Statistics for 1992 and 1998 from Le & al. (2001) ;

for 2004 from own calculation from data of VHLSS-2004 survey, Vietnam

It should be noted that it is difficult to classify workers into employment status in Vietnam because there is a group of employees who are both self-employed and wage earner and within self-employed it is difficult to distinguish non-farm self-employed from farm self-employed. The survey VLSS in 2004 reveals that there was 42 per cent of worker responding "yes" for the question whether or not they have a second job. There was 29 per cent of worker having two different employment statuses. The table (3) shows the distribution of worker by employment status. Statistics for two first years are taken from Le & al.(2001). Those for 2004 are obtained from own calculation from VLSS 2004. In our calculation, we classify workers according to their first job's status or the most time

consuming job in other word. In line with the decline in agricultural worker, the share of farm self-employed decreased of 15 per cent during 1992 to 2004. Total wage employment increased to around 30 per cent. As for the non - farm self employment sector, its share rose to more than 18 per cent of total workforce in the labour market of Vietnam in 2004.

3 Occupational choice literature review

Given the important role of self-employment in the economy (De Wit, 1993), the research on the self-employment sector received a great attention from the last decade. Among many research tracks, the determinants of occupation choice between self - employed and employees have emerged as the important one³. Theoretical and empirical studies of the field marked out many determinants that influence on the choice between self-employment and wage employment of an individual. We present in this section some main factors widely used in the model of occupational choice.

Nearly all researchers have considered the influence of the educational attainment on the decision of worker (Rees and Shah, 1986 ; Gill, 1988 ; Evans and Jovanovic, 1989 ; De Wit, 1993 , Bernhardt 1994). It is argued by Le (1999) that there are several channels through which educational attainment influences the possibility of being self-employed.

On the one hand education can enhance the managerial ability of a person and then facilitate the entry into the self-employment sector. On the other hand a higher educational level is likely favourable the finding of a salary job and then decreases the probability to be self-employed. Le also claims that the influence of the educational level on the propensity to be self-employed should be empirically rather than *a priori* considered. Empirical evidences involving the question followed two opposite sides. Empirical researches of Rees and Shah (1986); Borjas and Bronars (1989) and Evans and Leighton (1989) support the first argument that a more educated person has higher probability than a less well educated person of choosing self-employment. Nevertheless, the negative relation between the level of education and the propensity to be a self-employed is found in studies of Evans and Jovanovic (1989) ; De Wit (1993) ; Kidd (1993) ; Destré and Henrard (2004) . These mixed influences of educational level on choice decision may arise because of differences in the sampling method and the specification of the model (Le, 1999). In the equations that control for the occupational status, educational level plays a negative impact on the possibility to be self-employed while in those without the occupational status, the sign is positive or weakly negative.

In addition to academic formation, managerial ability may be also acquired throughout working period. It seems that knowledge accumulated in working period is more important in the occupational choice than that in formal education period because of its pragmatic characters. From this perspective, market experiences are then expected to have positive impact on the possibility of choosing self-employed. Another interpretation of the influence of experiences on the choice may be that a long with working-time, persons accumulated not only knowledge and skills of the field but also necessary capital to create their own business. Thus, individual who has more experiences has more possibility of choosing self-employed (Kidd, 1993). Another variable closely related to experiences is age. It can be used as proxy of market experiences, an older person

³See Le (1999) and Blanchflower and Oswald (1998) for survey of earlier research

has usually more experiences given his/her training period, or as attitude toward risk, older persons have less willingness to accept risk and then less likelihood to become self-employed. Empirical results in Rees and Shah (1986) support this positive relation while Bernhardt (1994) however, has found a non-significant one in his estimation. The reason is likely due to the introduction of financial capital factor in the model beside the working experiences variable. This outcome suggests that we should consider experience variable as financial capital variable than human capital variable.

The role of financial factors in the setting up of businesses has also drawn a particular attention of researcher. Using different measures of financial capital, Evans and Jovanovic (1989) ; Kidd (1993) ; Bernhardt (1994) ; Blanchflower and Oswald (1998) and Constant and Zimmermann (2006) have found a significant influence of liquidity constraints on the propensity to become self-employed. They all claim that financial capital is an important barrier to self-employment. It should be noted that wealth is assumed to be a barrier of entrant to self-employment while it might be the fruit of self-employment as well. Actually, many studies have used financial endowment as a determinant of self-employment status rather than the constraint at the setting moment of the business and this might bias the interpretation of the role of financial endowment as entry barrier.

Rees and Shah (1986) study among other factors the influence of earnings differential between self-employment and wage-employment on the occupational choice. They claim that people will choose the occupation which yield highest utility in term of earnings for them. The different earnings will be therefore positively correlated with the propensity to being self-employment. Their empirical results and those of Bernhardt (1994); Johansson (2000); Constant and Zimmermann (2006) may support this argument.

A number of variables concerning individual and familial characteristics are introduced as well in the model of choice. Marital status, the number of children in charge and spouse's work are usually used to measure the dependence, the stability, the attitude toward risk and even the availability of financial capital of one person.

It is likely that a married person is more prepared to take risks and family can support mentally the self-employed in its works (Rees and Shah, 1986). It is also argued that married people with children in charge have more responsibilities, and then they are less willing to take risks. Among these variables, spouse's work is evaluated as more important determinant of occupational choice in Le (1999). According to De Wit (1993), a person is more likely to take risks in order to get higher benefit if his/her spouse has work. Empirical evidences of Blanchflower and Oswald (1998) and Bernhardt (1994) confirm this interpretation.

The family background is also considered in the research of determinants of occupational choice. Many researchers stressed on the impact of father's job and mother's education on the propensity of being self-employed. They have found a significant influence of father's job on children occupation. A person would have higher probability to become self-employed if his father had been self-employed. However, if the father had stopped being self-employment, this would have had no significant impact on the individual decision (De Wit , 1993).

Certain factors such as ethnic group, race, native/immigrant group and mother languages to a certain extent play also an important role in determining the choice. The empirical results suggest the significant influence of ethnic group and race on the choice of worker (Borjas and Bronars, 1989). The behaviour of native/immigrant group in self-

employment sector becomes a well researched field especially in industrialized countries such as UK, US, Canada, Australia etc ⁴.

Last but not least, we want to talk about the role of attitude toward risk on the choice of being self-employed. It is widely accepted that the returns of entrepreneur are more variable and uncertain than the wages of employees. The self-employer is seen as risk bearer in De Wit (1993). He reports in his paper theoretical models of self-employment in which the role of attitude toward risk, entrepreneurial ability, risk involving self-employment, capital requirements and taxation are considered. Brief reviews on empirical analysis based on these models are then presented but no empirical evidence on the role of risk attitude is found in his survey. Later, in an excellent empirical survey of self-employment of Le (1999), the role of risk attitude is another time not mentioned any either. Cramer & al. (2002) claims that the missing of empirical test of the role of risk attitude on determining entrepreneurship is mainly due to the lack of data measuring the individual's risk attitude. They have conducted this empirical test and found that person with lower risk aversion has higher propensity to choose self-employment. The same results are found in Kan & Tsai (2006), who use a different measure of risk aversion.

4 Econometric method

4.1 The model

The analysis in our study considers the behavior of full-time workers in the labor market toward occupational choice. A good number of researches into occupational choice have expanded on workforce sample of developed countries while the case of developing countries remains less studied. In this paper, we apply the model widely used in the literature of choice behaviour to explain the decision of worker in the labour market of Vietnam. Our models are similar to those of Rees and Shah (1986), Evan and Jovanovic (1989), Bernhardt (1994), Blanchflower and Oswald (1998), Johansson (2000), Constant and Zimmermann 2006.

At the beginning we assume that only two occupations which are available in the market are self-employment and wage employment, and that workers are rational and know the implications of their choice. They know their own characteristics including the values of variables that not observed by others. Thus, *ceteris paribus*, an individual chooses to work in either the self-employed or wage salaried sector of the labor market which yield the highest benefits in term of utility. The utility obtained in each work is affected by the individual's characteristics and by the earnings from the two employment sector. Let U_{si} the utility of individual i if he/she work in self-employment sector and U_{wi} in employee sector. The self-employment will be chosen if:

$$(U_{si} - U_{wi}) \equiv \alpha(\ln Y_{si} - \ln Y_{wi}) + \beta X_i + \epsilon_i > 0 \quad (1)$$

where $U_{ji}(j = s, w)$ represents the utility an individual i can expect to receive from employment in sector j . Y_{ji} represents earnings from two occupational statuses and α is a parameter to be estimated (it is expected to be positive). X_i is a vector of individual characteristics and variables that influence the occupational choice between

⁴See Le (1999b) for more details on previous analysis

self-employment and wage employment for individual i . β is a vector of parameters to be estimated. Lastly ϵ_i is the error term. The function (1) can be written in the form of a probit model such that an individual will choose self-employment if :

$$Prob (U_{si} - U_{wi} > 0) = Prob [\alpha(\ln Y_{si} - \ln Y_{wi}) + \beta X_i + \epsilon_i > 0] \quad (2)$$

and

$$\epsilon_i : N(0; \sigma_i^2) \quad (3)$$

The major difficulty of the function (2) is that we know only the return of self-employment or employee of one person corresponding to her/his choice at any given time but not both of them, so the earnings differential can not be observed. To overcome this difficulty, separate earnings equations for the employed and the self-employed sector are estimated to predict individual's expected earnings in each sector. Up to this step, the second difficulty involving the selection bias is raised from the consideration that workers in a sub-sample of self-employment or wage-employment may behave differently from the rest in that they have a comparative advantage of self-employment or wage-employment and hence choose that status. In other word, the selection rule allocates individuals into sub-sample according to greatest utility but not to random rule. To solve the second difficulty we use the two-stage estimation methods presented by Heckman (1979) or Maddala (1986) in which the earnings equations are estimated simultaneously on a set of control variable as in human capital Mincer model and on selection terms calculated from reduced form probit equation. These earnings equation are then used to predict the individual's expected earnings in each sector. The reduced form probit choice equation may be written as :

$$I^* = X_i \beta + u_i \begin{cases} \geq 0 & \text{if self-employment is chosen} \\ < 0 & \text{if wage employment is chosen} \end{cases} \quad (4)$$

where u_i is error term and assumed to be normally distributed with zero mean and constant variances. β and X_i are similar as in function (2). The self-employment sector will be chosen if $I^* > 0$ and the wage sector otherwise. The expected earnings of individual i are then:

$$E(\ln Y_{si} | Z_i, I^* > 0) = \gamma_s Z_i + \delta_s \lambda_{si} + \eta_{si} \quad (5)$$

$$E(\ln Y_{wi} | Z_i, I^* < 0) = \gamma_w Z_i + \delta_w \lambda_{wi} + \eta_{wi} \quad (6)$$

where Z_i is a vector capturing the observed influences on earnings and following Mincer type model, consist of human capital variables, personal attributes and other control variables. γ and δ are vectors of parameter to be estimated. η is error term and $\eta : N(0; \sigma^2)$. λ_{si} and λ_{wi} are selection terms calculated from reduced form probit equation (equation 4), where:

$$\lambda_{si} = \frac{\hat{f}(-X_i \beta / \sigma_u)}{[1 - \hat{F}(-X_i \beta / \sigma_u)]} \quad (7)$$

$$\lambda_{wi} = \frac{[-\hat{f}(-X_i \beta / \sigma_u)]}{\hat{F}(-X_i \beta / \sigma_u)} \quad (8)$$

where $\hat{f}(-X_i \beta / \sigma_u)$ and $\hat{F}(-X_i \beta / \sigma_u)$ are respectively standard normal density function and standard normal cumulative density function of evaluated at $(-X_i \beta / \sigma_u)$. The sample selection terms enable consistent estimation of the earnings equations.

The estimation of these equations bases mainly on the normality assumption of error term while as mentioned in Heckman (1979), Maddala (1986), Lee (1982) and Bernhardt(1994) the earnings equations estimated by OLS are not log normal. The errors terms in two equations are not normally distributed. However, Lee(1982) proved that the two stage method will yield consistent parameter estimates unless the assumption of normality of the error term in sector choice equation is correct and thus the estimates of sample selection term is consistent. That earnings equation errors are not normal does not imply that selection equation error is not normal. The holding of the normality assumption in the selection equation is depends mainly on fit. The problem is that the standard choice model logit, probit, arctan give similar fits, sometime it is difficult to choose among them. Furthermore, in 1985 and 1990, Heckman and Sedlacek, used a more general function form for the potential earnings than log normal in a maximum likelihood function of a model that similar to the model we used here and they found that if the potential earnings distributions are not too far from normal we might take the errors in the choice equation as being normally distributed and earnings estimations by OLS are still consistent.

4.2 Statistical procedure

Our estimation takes place in three stages. Firstly, the reduced form probit equation, equation (4), is estimated. The results of this estimation show the influences of individual's characteristics on the selection into self-employment and used to calculated the selection terms λ_{ji} . In the second stage, earnings equations for two employment statuses are estimated, equation (5) and (6), in which selection terms are introduced to yield unbiased expected earnings of two employment sectors. Finally, we estimate the structural probit equation, equation (1), in which the expected earnings differential is introduced as explicative variable. Thus, an individual will choose the self-employment sector if:

$$U_{si} - U_{wi} > 0 \Leftrightarrow \alpha(\ln\hat{Y}_{si} - \ln\hat{Y}_{wi}) + \beta X_i + \epsilon_i > 0 \quad (9)$$

or in term of structural probit function form:

$$Prob(U_{si} - U_{wi} > 0) = Prob[\alpha(\ln\hat{Y}_{si} - \ln\hat{Y}_{wi}) + \beta X_i + \epsilon_i > 0] \quad (10)$$

where $\ln\hat{Y}_{si}$ and $\ln\hat{Y}_{wi}$ are respectively the earnings predicted by Heckman or Maddala methods of individual i in the two employment statuses.

5 Data and variables

5.1 Data

We use, in this study the Vietnam household living standard survey in 2004 conducted by General Statistics Office (GSO) of Vietnam, under the technical assistance of the World Bank. This is one in a series of five surveys taken every two years in Vietnam from 2002 to 2010. The approach of these surveys is compliant with the framework used in the World Bank's Living Standard Measurement Surveys. The samples are representative for the whole country and for eight geographic regions.

Each survey contains household questionnaire and community questionnaire. The household questionnaire covers a large field of individual information and household information as: education, employment, health, income and expenditure, saving, housing, access to base public services etc.

The community questionnaire consists of question on basis physical and demographic characteristics, general economic conditions and economic activities, physical infrastructure conditions and transportation, agricultural production at the communal level etc.

In comparison with the 2002 round, the sample in 2004 is rather smaller with 9200 households but the 2004 survey contains more details on histories of business activities of household. The questionnaire makes out of the 3 categories of worker: salaried worker, farmer and self-employed. The definition of self-employed includes all persons who work for a business enterprise or profession organized and managed by their household at the time of the interview.

We consider in this analysis the behavior of full time worker in urban area so that we exclude from the sample part time workers (less than 40 hours per week), those in agriculture - by the nature of the questionnaire and those in rural area. The self-employed workers who have not a fixed work location are also excluded from our sample to build a sample of self-employment as homogeneous as possible. An important attention must be paid here, that the practice of multi-job holder is rather popular in Vietnam, we exclude also in our sample, workers who have jobs in two different categories cited above (self-employed / salaried worker). Unlike many articles⁵, we do not restrict our sample to head of household due to the tradition of Vietnamese family, more than two generals in working age and/or "basic- families" live in a household.

Our final sample consists of 2527 persons from 16 to 70 years old for both man and female workers of which 1622 are salaried worker and 905 are self-employed worker in urban areas of 64 provinces of the country. The sample of self-employment in our studies is rather bigger than those in studies of Rees and Shah (1986), Bernhardt (1994), Kolev (2000), Gill (1988), Le (1999b), whose proportions of self-employment are around 10% of the sample. However, if we dealing only with man sample, this proportion is turned down to 28% in comparison to 36% of full sample.

5.2 Variables

The explanatory variables used in the study consist of explainers of earnings as in Mincer model and of choice decision. Among these variables, some may affect both potential earnings and the occupational choice of workers.

Academic educational attainment is captured by a set of dummy variables indicating number of schooling years in education level (*1-5* ; *6-9* ; *10-12 years*). Under-graduate level is a dummy for persons who have undergraduate and postgraduate degree equivalent to at least 15 years of educations. A dummy variable is included for workers who have professional training courses (Vocation).

We use (*AGE*) as proxy of potential experiences in labor market. Following human capital theory, we assume the usual concave shape of earnings over cycle life. This consideration implies that quadratic term of age (*AGE²*) should be included in the earnings function and accounts for the decreasing return to labor market experiences.

⁵See: Bernhardt ; Destré and Henrard etc.

Vietnam is decomposed into 8 economic regions from the North to the South, regional dummy variables are used therefore to capture these eight economic regions. Big city dummy variable (*CITIES*) is included for those who live in five big cities classified by economic weight in GDP of Vietnam. Economic branches are captured by a series of industry dummies. Marital status variable (*Married*) is quoted one if individual is married, zero otherwise.

Included in the selection equation are variables that affect choice decision. In line with study of Bernhardt (1994), Evans and Jovanovic (1989) and Blanchflower and Oswald (1998), we assume that the setting up of a business activity is constraint by financial sources, we thus introduce variable reflecting financial endowment in selection equation: dummy variable for whether or not they owned their home (*HOME*). We consider also the role of reservation wage on the propensity to become self-employment, log of other household earnings (*OTHERincome*) is then included in our models. Other earnings than wage or income from business activities may be familial aid from within country or from overseas, incomes from capitals, real state renting and even pension for retired persons, etc. We adopt also the assumption that the existence of children affects the employment of the parents. We therefore use three variables classified by age groups of children: number of children aged 5 years of less (*CHILD0-5*); number of children from 6 to 10 years (*CHILD6-10*); number of children from 11 to 15 years (*CHILD11-15*).

As we presented above, female self-employed remained less studied in the literature of self-employment. We therefore, distinguish estimations for male from female employment in our paper. Our aim is to give separately information on the determinants of self-employment sector for male and female. We can make some interesting comparisons from the result of male and female estimation.

6 Empirical results and discussion

6.1 Characteristics of workers in the sample

Descriptive statistics of our sample are presented in (table 4) in appendix. At the first glance, we can see that the average earnings of self-employed are higher than those of salaried worker for man only. The differentials, even rather small, are statistically different from zero. Whilst for women, average earnings of self-employed are a little less than those employees. The standard deviations of income of self-employed are also higher than those of employees, as twice as those of employees. The finding in male statistic supports the argument that self-employed are those who are willing to take more risks in order to gain more in their job then their incomes are higher and more disperse than those of salaried workers. With respect to female worker, it suggests *a priori* that higher gain in term of earnings should not be female self-employed's target. Nevertheless, other incomes (earnings from activities other than business activities for self-employed, earnings other than wage/salary from paid work for employees) of self-employed are quite smaller than those of employees.

The statistics show that on the average, those in self-employment sector are older and less educated than those in wage-employment sector. Some interesting divergences in distribution of worker by age are also worth noticing. As we can see in the figure (1), the same patterns are found for both sexes in the two employment groups studied.

Both of sexes have experienced lower shares of young workers and higher share of over 35 years old workers in the self-employment sector than in the wage/salary sector. It has to note that the conventional retirement age of salaried worker is 60 years old for man and 55 year old for female in Vietnam. Thus, the percentage of worker which is older than 50 years old declines quickly. In summary, young workers have tendency to choice wage sector while mature workers have tendency to choice self-employment sector.

Regarding the marital status, the majority of self-employed are married while the share of married people in employees sector is lower. The number of children in charge under 5 years old of self-employed is lower than those of employees whereas the number of children from 6 to 16 years old is higher. These results are in line with the statistics of worker age. Young workers have tendency to work in salary sector and young people have usually younger children. The number of young children of employees is therefore higher than those of self-employed.

Concerning with the educational level, the percentage of self-employed at under-graduate level is particularly lower than those of salaried/paid worker. Only 6.39 % compared with 28.92% for male and 3.49% with 26.16% for female have under-graduated or graduated degree in self-employment sector. Workers 10-12 years of educations (12 years for baccalaureate level) take the first rank in salaried sector and the second in self-employment sector. Around 65% of worker in salaried sector have more or equal than 10 years of education, while only 44% of man and 33% of women have in self-employment sector. We also note that in self-employment sector the educational level of man is rather higher than that of woman. That of employees is rather similar for both man and women. The proportion of male workers who participated in a vocational training course is rather similar (27.31/22.78). With regard to female ones, the proportion in the self-employment sector as twice as that in the wage sector (28.32/12.48).

The distribution of worker across industrial branches differs a lot across sector and sex. Trade (wholesale and retail trade) is the branch that draws the most workers in self-employment sector especially for female. The second and third ranks consist of two fields of service sector (restaurant and hotel; transport and other services). The quantity of business activities in industrial sector in general is the lowest especially for female. These results in self-employment sector in Vietnam are similar to those of many other developing countries.

As for wage sector, around 45% of employees works in the transport and other services branch. Unlike self-employment sector, the rate of worker in restaurant and hotel service is particularly low for male. Industrial branches which are different from food processing and confection, leather and shoes take the second rank in drawing worker. The rate of male worker in these branches is twice as high as that of female. The industrial branch such as confection, leather and shoes draws more female than male worker (about 4 times higher).

The last group of variables consists of a set of regional dummy variables. The distribution of worker across sector and sex is rather similar.

The discussion of the earning functions' estimation results proceeds in three steps. In the first step, the reduced form probit equation for male and female choice equation is displayed. In the second step, the results of OLS estimation of the earnings functions corrected to selection bias are presented. The last step consists of structural probit of choice decision.

6.2 Reduced-form probit choice equation

The reduced form selection equation is shown in table (5). Although the role of this regression is to obtain estimation of the selectivity terms, it yields some preliminary results worth looking through.

The first interesting result is that the sign of the variable measuring the financial resources is significant at the 5 per cent level in male choice equation. The persons owning the home where they live have more propensity to become self-employed than do not persons. Reservation wages (OTHERincome) however exercises a negative influence on the status of employment. The higher the secondary source of income is, the lower the possibility to enter into self-employment is. This result seems different from the literature. It should be noted that reservation wages mainly consist of remittances from Vietnamese overseas and it is found that this capital flow has been channelled to the setting up of registered enterprises beside investment in real state and capital market. We can deduce that reservation wages are used to create formal enterprises rather than informal ones while our sample is made up of a great number of informal ones. Therefore, it is suggested that the influence of reservation wages on business setting - up should have been scaled down in our equation.

For female employment, the signs of these two variables are similar to those of male equation but neither of these variables is significant. The similar outcome concerning the role of homeownership in male employment is found in Constant and Zimmermann (2006) with a sample of German man worker.

As for educational attainment, the coefficient of education is negatively significant at 10 percent at the most for male having 10 to 12 years of education or having undergraduate degree compared with person having 5 years of education or less. The influence of educational level on the female status experiences the similar trend with the level of significant of 5 per cent at the most. Thus, the results suggest that persons who have less years of education have more propensities to choose self-employment sector. This result is consistent with the empirical statistics of our sample. Highly educated persons tend to work in wage employment sector. Vocational training course (Vocation) has significant and negative impacts on the decision of being self-employed. Individuals who follow these courses have less probability to work in self-employment sector than individuals who do not.

The impact of the numbers of children in charge differs across children age group. The coefficient is positively significant for male who have children aged 6 to 10 years old and female who have children aged 11-15 years old. Marital status has not any significant influence on the decision of male worker while it is significant at 5 percent for female worker.

All dummy variables for economic branches are significant at 5 percent for both male and female (dichotomous variable for other industries is omitted). In other word, persons who work in these sectors have more propensities for being self-employed.

6.3 Earnings equations

The earnings equations are shown in table (6). The dependent variable in the earnings equations is the log of annual earnings. As we presented in section 3, the earnings model is based on the theory of earnings developed by Mincer (1974), in which the earnings

of an individual depended on educational attainment and work experiences. Mincer acknowledged that other factors beside these two variables also influence earnings and consequently an extended version of the Mincer model that includes a range of personal characteristics and structural factors is widely used.

Look at first the influence of unmeasured variables on the earnings (λ) for male employment. The coefficients of selection correction $[-f(-X_i\beta/\sigma_u)/F(-X_i\beta/\sigma_u)]$ is negative in earnings equations of employees, the coefficient $f(-X_i\beta/\sigma_u)/[1 - F(-X_i\beta/\sigma_u)]$ is positive in earnings equation of self-employed. The signs of these coefficients are in line with our expectation but they are however not significant at conventional level. It means, in our sample, any selection bias is found for male in other word, those who work in one sector have not comparative advantages in that sector than persons working in other sectors. It is noted that our results in male self-employment sector are different from those of Bernhardt (1994) and Le (1999b) who found a negative selection into self-employment in their sample.

With regard to female employment, the selection coefficients are both negative but significant at 1 per cent only for persons working in wage/salary sector. The fact that selection term is not significant in self-employed equation indicates that self-employed workers are a random sample of all workers. Nevertheless, the significantly negative sign of selection coefficient of female employees implies the positive selection into this employment status. This result suggests that compared to other workers, persons who work in wage sector have more comparative advantages in this sector. Therefore, the predicted earnings of these persons in this wage sector are higher than those of a person with the same observable characteristics who is randomly chosen in the sample of all workers. Our result is in line with those of Bernhardt (1994), De Wit (1993); Le (1999b) who found positive significant selection bias in wage/salary employment of male workers.

We now consider the influence of measured variables on worker's earnings. In general, the results are particularly quite strong (in term of significance) for male workers except for regional and industrial dummy variables. Regarding the potential working experiences, the results found in this study are consistent with Mincer's model that is the relationship between experiences in workforce and earnings in non linear. The sign of square age is significantly negative for both sexes at the level of 10 per cent at the most. The same signs are found in the earnings equations of Moock & al. (1998) ; Liu (2006) and Pham & Reilly (2006), who use the VLSS 1992-1993, 1997-1998 and 2002 in their studies. For male self-employed, an extra year of age raises the earning of self-employed at 9 per cent and at 6 per cent for employees. Our results are partial in contrast with those of Rees and Shah (1986), Le (1999b) to the extent that in their studies labor market experiences play a larger influence on the earnings of the employees than the self-employed.

As for educational level, the empirical evidences show that it plays an important role in the determination of earnings. The returns to education have increased with years of education. For male self-employed, persons who have 10 to 12 years of education earn 40.7 per cent higher than those having equal or less than 5 years of education, and 83 per cent for under-graduate level in self-employment sector. The similar trend is found in wage sector but the extent to which educational level influences the earnings is smaller. In both equations, empirical evidence shows that the influence of educational attainment on persons having 6 to 9 years of education is not significantly different than those having

less than 5 years of schooling. In comparison with the results regarding the return of education on earnings in Mook (1998) and Liu (2006) , we find an increasing return to education in term of earnings through out the transition in the labour market of Vietnam.

In addition to academic education, the reward of vocational training course to earnings is strongly significant for employees at the level of 1 per cent. Individual who gets vocational training course earnings much more 17.2 percent than does not individual. However, it does not have any significant role in self-employed sector and for female worker as well. The empirical results show that married persons earn significantly higher than non-married ones, an extra of 39.2 per cent in self-employment sector and 18.9 percent in wage sector. These results are in line with the ideas that married men, who have family's responsibilities, may be put under greater pressure to succeed. Hence, it is assumed that married man may be more productive than unmarried man. This rule seems not to be applied for female workers. Marital status does not play any significant impact on female earnings.

A part from human capital characteristics, many researchers added geographic location dummy variable into the earnings equation (e.g. Borjas and Bronas (1989) ; Kidd (1993) ; Le (1999b)). The influences of these variables on earnings differs across equation specifications⁶. In our model, we introduce a dummy variable for 5 big cities, and a set of 8 regional dummies. The variable *Cities* is positively significant at 5 per cent in maximum in earnings equations for both of sexes. The earnings of self-employed living in these cities are 20.1 per cent higher than do not persons. The similar percentage for employees is 30 per cent. Respectively rate for female are 44.5 and 30 per cent. Among regional dummy variables, at least one of these dummies is statistically significant in each equation. It means that incomes of persons living in South East region of Vietnam are higher than those of persons living in Red river Delta region at the significant level of 10 per cent at most.

We include also in our earnings model dummies for economic branches. Empirical results show that economic branches play a significant influence on earnings except for female self-employed. Any of these dummies is significant in earnings equation of female self-employed.

6.4 Earnings differentials

As in Bernhardt (1994) , we compute the absolute earnings differentials in the two sectors by estimating the expected earnings of self-employed workers in wage-employment and self -employment sector and the expected earnings of employees in these two sectors as well. These values are shown in table (7). We can see that for male workers, employees have higher potential earnings in both sector compared with those of self-employed. The statistical tests show that the differentials between predicted earnings of two worker groups in each situation are significantly different from zero. These results imply the comparative advantages of worker in each section in term of pecuniary gains. However, these advantages, represented by selection term are not significant in earnings equation.

With regard to female workers, potential earnings of employees in the self-employment sector is higher than potential earnings of self-employed in their sector. This gaps is also

⁶See : Le 1999b for more details

different from zero. However, no significant differential in expected wage between self-employed and employees is found in the wage-employment sector. These results suggest that wage workers have more comparative advantages in the self-employment sector than do self-employed workers. It argued by Bernhardt (1994) that there is an entry barrier to self-employment that protects less productive workers. Therefore, in the case of Vietnam, although female salaried workers have more comparative advantages in self-employment, they are constrained to stay in salaried sector.

The analysis of earnings differential based on the methodology developed by Blinder (1973) and Oaxaca (1973) provide some more details on the determinants of this differential among worker groups. The average absolute earnings differential between two groups is decomposed into an endowment and a residual component. From equation (5) and (6), with weight equal zero ($W=0$) the earnings differential can be decomposed as:

$$\bar{Y}_s - \bar{Y}_w = (\bar{Z}_s - \bar{Z}_w)\hat{\gamma}_w + \bar{Z}_s(\hat{\gamma}_s - \hat{\gamma}_w) \quad (11)$$

or for ($W=1$) as:

$$\bar{Y}_s - \bar{Y}_w = (\bar{Z}_s - \bar{Z}_w)\hat{\gamma}_s + \bar{Z}_w(\hat{\gamma}_s - \hat{\gamma}_w) \quad (12)$$

Where bars on variable indicate means and hats denote estimated coefficients. The exogenous variables are valued at their mean values (or in the case of dummy variables, the respective share in the sample). These values are then weighted with the estimated coefficients of the earnings function to calculate the projected earnings (in logarithmic scale). This allows the overall average differential in wage between two worker categories to be decomposed into a part attributable to differences in observed characteristics of human capital and other control variables, the explained or endowment effect, and an attributable part to differences in the estimated relationship between self-employments and employees, the unexplained or residual effect. The endowment effect is decomposed by the first group $(\bar{Z}_s - \bar{Z}_w)\hat{\gamma}_w$ and residual effect the second group $\bar{Z}_s(\hat{\gamma}_s - \hat{\gamma}_w)$.

The results are displayed in table (8). The endowment effect of man worker is equal to 0.0013 while the residual effect is 0.186 (for W equal to 1). The results for female are 0.016 and -0.154 respectively. As we can see a major part of differentials between two worker-categories in potential earnings for both male and female workers are due to the effect of unobserved determinants.

6.5 Structural Probit equation

Using the estimated equation (5) and (6) we can compute expected earnings differentials ($DIFF = \hat{Y}_{si} - \hat{Y}_{wi}$) for each individual i . By introducing this variable into the reduced probit equation, the structural probit equation can be estimated, and the results are displayed in table (9). We drop out in these estimations workers who have never gone to school. Data analysis show that in our sample in particular, all most male workers without any year of education have higher expected earnings in the alternative sector that they do not belong to in reality. This result leads to the fact that the effect of expected earnings differentials is biased due to this group of workers. With regard to female, the estimation results do not change considerably if this group of worker is drop out. We prefer to present the dropped out version to facilitate the comparison between gender⁷.

⁷Results of full regression will be communicated by contacting authors

The Chi2 test rejects the constrained model in which all coefficients except the contents term are set equal zero at the level of 1 per cent. Compared to the reduced form approach, the insertion of the earnings differentials as explicative variable in structural probit equation does not lead to important changes in the coefficients of other control variables in male equation, while for female employment, the role of academic educational level and marital status become irrelevant determinants of the self-employment choice. Like Johansson (2000), we perform also some regressions in which years of education dummy variables or marital status are alternatively dropped in the structural equation to test the robustness of earnings differentials. The checks show that our results are not sensitive to the equation specification as in Johansson's one. The reason consist perhaps in the sampling method of Johansson . He pulled together male and female workers in an equation and captured the gender difference by a dichotomous variable.

Regarding to the earnings differentials variable, the sign of *DIFF* is positively significant in male equation structural choice equation. This result suggests that difference in expected earnings of two sectors is a major determinant of occupational choice for man in term of coefficient's absolute value. Our findings are in line with those of Rees and Shah (1986) with a sample of UK man worker, Bernhardt (1994) with a sample of while Canadian man, Destré and Henrard (2004) with a sample of Columbian man; Constant and Zimmermann (2006) with sample of German man.

As for female employment, it seems not surprising to find that the coefficient of earnings differential is negatively significant at 1 per cent. As we can see in the section above, the female self-employed have higher predicted earnings in the alternative sector. These results may imply that pecuniary gain should not be a significant motivation that encourages women to go into self-employment. On the contrary, they accept to work in this sector and receive lower earnings than they would have if working in wage sector. The negative association may be caused by the fact that the earnings of female self-employed have been under reported compared with those of wage workers. This finding suggests also that there should be non pecuniary gain that affects the choice of women. An other reasons might consist in the fact that a group of female workers have been forced to go into the self-employment sector because of their impossibility to find a job in wage sector. Therefore, they have to run a low productivity business to survive. It is then suggested that unemployment risk should be included in our model. Our result is similar to that of Gill (1988) [10] who found a negative and significant coefficient of earnings differentials in a male sample of US aged from 20 to 30 years old. It is argued by Gill (1988) that the predicted earnings differentials do not adequately represent the expected lifetime earnings differentials between the two sectors and that wage growth differs across sector.

Education attainment still influences negatively to the probability of being self employed in both male and female equation. It probably suggests that formal education does not necessarily supply appropriate qualifications for being self-employed (Lentz and Laband, (1990) [22]). That the negative signs are more important for those who have high education or professional education, confirms that education is more appreciated in employee sector than self-employment sector (de Wit, (1993)). Further more, it is interesting to note that educational attainment plays positive impact on earnings of self-employment. This may imply that wage sector would offer some unknown opportunities for highly educated persons that would not be found in self-employment sector.

As regard the effect of age on the probability of being self-employed, the signs are

significantly positive in two equations. The relation between age and propensity to be self-employed is suggested to be linear because age square is not significant while introduced in the structural equation. This result is consistent with the practice in Vietnam that, individuals do not leave the labor market at conventional retirement age, but prefer to enter to the self-employed sector probably due to low pension.

7 Conclusion

In this paper, we investigate the determinants that might affect the workers' decision to go into the self-employment sector in Vietnam. The results show that our variables are more relevant in the estimations on male workers sample.

Our main findings are summarized as follow. Predicted earnings differential has positive effect on the propensity of being self-employed for males only. While for females, it plays a negative role. Educational attainment affects also negatively on the probability of being self-employed for male only. Age influences positively significant the occupational choice. Marital status and children in charge are not significant determinants for self-employment for male workers at all. Whilst for women, the number of children in charge plays a positive influence on the propensity to go into self-employment sector but the influence differ across children's age. With regard to financial endowment variables, homeownership plays positive effect on the probability of being self-employment. However, reservation wages plays a negative one. There two variables are significant for male workers only.

These results suggest that there exist unknown factors that encourage highly educated persons to choose wage sector despite their higher predicted earnings in self-employment sector. With respect to female workers, unknown pecuniary gain and unemployment risk are supposed to be important in determining the choice between self-employment and wage-employment sectors.

Given the important role of self-employment sector in the labor market of Vietnam and in the creating of powerful and dynamic domestic enterprises, this study provides a basis for understanding the determinants of this employment status. This might be helpful for authorities to make an adequate policy in the sector.

References

- [1] I. Bernhardt. Comparative advantage in self-employment and paid work. *Canadian Journal of Economics*, 27:273–289, 1994.
- [2] D.G. Blanchflower and A.J.Oswald. What makes an entrepreneur? *Journal of labour Economics*, 16:26–60, 1998.
- [3] G. J. Borjas and S. G. Bronars. Consumer discrimination and self-employment. *Journal of Political Economy*, 97:581–605, 1989.
- [4] A. Constant and K. F. Zimmermann. The making of entrepreneurs in germany: Are native men and immigrant alike? *Small Business Economics*, 26:279–300, 2006.

- [5] J.S. Cramer, J. Hartog, N. Jonker, and C. M. Van Praag. Low risk aversion encourages the choice for entrepreneurship: an empirical test of a truism. *Journal of Economic Behavior & Organization*, 48:29–36, 2002.
- [6] G. de Wit. Model of self-employment in a competitive market. *Journal of Economic Surveys*, 7:367–397, 1993.
- [7] G. Destré and V. Henrard. The determinants of occupational choice in colombia : an empirical analysis. *Cahiers de la Maison des Sciences Economiques, Maison des Sciences Economiques, Université Paris 1 Panthéon-Sorbonne*, 2004.
- [8] D.S. Evan and B. Jovanovic. An estimated model of entrepreneurial choice under liquidity constraints. *Journal of Political Economy*, 79:808–827, 1989.
- [9] D.S. Evans and L. S. Leighton. Some empirical aspect of entrepreneurship. *American Economic Review*, 79:519–535, 1989.
- [10] A.M. Gill. ‘choice of employment status and the wages of employees and the self-employed: some further evidence’. *Journal of applied econometrics*, 3:229–234, 1988.
- [11] J.J. Heckman. Sample selection bias as a specification error. *Econometrica*, 47:153–161, 1979.
- [12] J.J. Heckman and G. Sedlacek. Heterogeneity, aggregation, and market wage functions: an empirical model of self-selection in the labor market. *Journal of Political Economy*, 93:1077–1125, 1985.
- [13] J.J. Heckman and G. Sedlacek. Self-selection and the Distribution of hourly wages. *Journal of labour economics*, 8:S329–S363, 1990.
- [14] E. Johansson. Self-employment and the predicted earnings differential-evidence form Finland. *Finnish Economic Paper*, 13:45–55.
- [15] K. Kan and W.D. Tsai. Entrepreneurship and risk aversion. *Small Business Economics*, 26:65–474, 2006.
- [16] M. P. Kidd. Immigrant wage differential and the role of self-employment in Australia. *Australia Economic Papers*, 32:92–115, 1993.
- [17] A. Kolev. Determinants of the labor supply in Russia and the informal economy. *Revue d’études comparatives EST/OUEST*, 31, 2000.
- [18] A.T. Le. Empirical studies of self-employment. *Journal of Economic Surveys*, 13:381–417, 1999.
- [19] A.T. Le. Self-employment and earnings among immigrant in Australia. *International Immigration*, 37:383–412, 1999b.

- [20] X.B. Le, C. L. Cu, T. K. D. Nguyen, and V. T. Nguyen. The labour market in vietnam: growth, poverty reduction and adjustment to crisis. *Labour Markets in Transitional Economies of Southeast Asia and Thailand, Development Analysis Network (DAN)*, (Ottawa, IDRC and Phnom Penh, Cambodia Development Resource Institute), 2001.
- [21] L.F. Lee. Some approaches to the correction of selectivity bias. *The Review of Economic Studies*, 49:355–372, 1982.
- [22] B. Lentz and D. Laband. Entrepreneurial success and occupational inheritance among proprietors. *Canadian Journal of Economics*, 23:563–579, 1990.
- [23] A.Y.C. Liu. Changing wage structure and education in Vietnam, 1992 - 98, the roles of demand. *Economics of Transition*, 14:681–706, 2006.
- [24] "G.S. Maddala". *"Limited-dependent and Qualitative Variables in Econometrics"*. "Cambridge University Press", "1986". "Cambridge".
- [25] A. McCarty. The employment and social consequences of Vietnam's international economic integration. *UNIDO/UNDP/CIEM mimeo*, 1999.
- [26] P.R. Moock ; H. A. Patrinos and M. Venkataraman. Education and earnings in a transition economy the case of Vietnam. *Policy Research Working Paper Series, The World Bank*, 1920, 1998.
- [27] T. H. Pham and B. Reilly. The gender pay gap in Vietnam, 1993-2003: A quantile regression approach. *PRUS Working paper*, 34, 2006.
- [28] H. Rees and A. Shah. An empirical analysis of self-employment in the UK. *Journal of Applied Econometrics*, 1:101–108, 1986.
- [29] B. Tamara. *"Vietnam: Lessons in building linkages for competitive and responsible entrepreneurship"*. UNIDO and Kennedy School of Government, 2006. Harvard University.
- [30] Vietnam National University. *"The informal economic sector: Realities and problems for the management"*. Nha xuat ban dai hoc Quoc Gia Hanoi, 2004. Hanoi.
- [31] W.P.M. Vijverberg and J. Houghton. Household enterprises in Vietnam: Survive, growth and living standards. *World Bank, Policy Research Working Paper*, PS2773, 2002.
- [32] World-Bank. *"Vietnam Development report 2006. Business"*. World Bank, 2005. Vietnam.

Figure 1: Age distribution of male worker in Vietnam in 2004

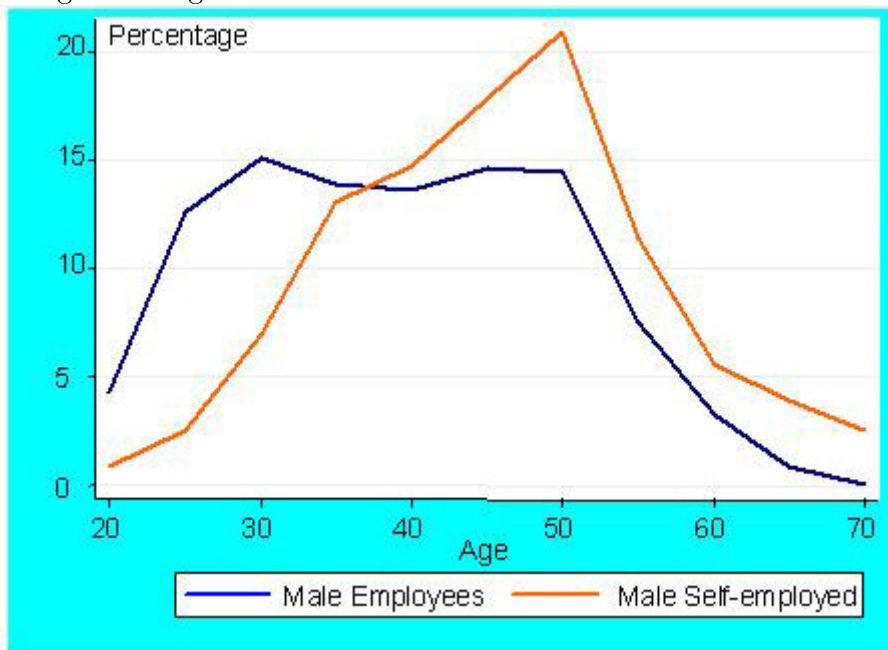


Figure 2: Age distribution of female worker in Vietnam in 2004

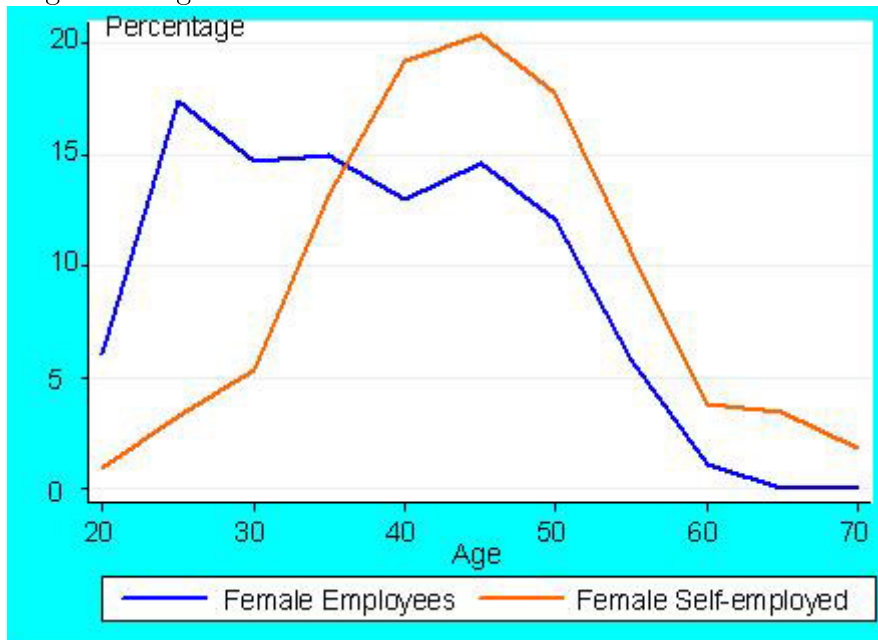


Table 4: Descriptive statistics

Variables	Male				Female			
	Self-employed		Employees		Self-employed		Employees	
	Mean	Std	Mean	Std	Mean	Std	Mean	Std
Income	9.83	0.87	9.609	.602	9.39	0.811	9.401	.551
Age	43.60	10.14	37.24	10.82	42.66	9.92	35.02	10.32
Other-income	6.702	2.989	7.328	2.776	7.081	2.687	7.368	2.702
CHILD 0-5	.247		.253		.172		.183	
CHILD 610	.311		.237		.251		.213	
CHILD 1115	.481		.327		.489		.242	
Cities (value in %)	26.38		38.27		29.70		43.60	
Married (value in %)	91.66		72.25		91.3		66.6	
<i>Industry dummies (Value in percent)</i>								
Industries	10.83		37.53		1.83		18.06	
Trade	42.78		10.00		55.96		10.12	
Restaurant & hotel	13.61		1.61		21.65		4.62	
Transport and other services	22.22		43.87		9.17		46.97	
Food processing	5.83		3.12		4.77		5.35	
Confection, leather & shoes	4.72		3.87		6.61		14.88	
<i>Years of education dummies (Value in percent)</i>								
1-5 years	15.56		7.96		22.94		8.38	
6-9 years	39.72		27.2		42.94		22.69	
10-12 years	38.33		35.91		30.64		42.77	
Under-graduate	6.39		28.92		3.49		26.16	
Vocation	22.78		27.31		12.48		28.32	
<i>Regional dummies (Value in percent)</i>								
River Red Delta	18.33		21.83		17.43		24.13	
North Est	9.17		13.33		10.64		11.13	
North West	1.67		1.40		1.28		2.89	
North Central Coast	6.11		7.63		8.26		5.64	
South Central Coast	13.06		12.15		14.31		11.85	
Central High Land	5.00		3.76		8.07		2.17	
South Est	24.44		27.10		23.12		29.77	
Mekong River Delta	22.22		12.80		16.88		12.43	
Observation	360		960		545		692	

Std: standard deviation

Table 5: Reduced probit equation

COEFFICIENT	Male (1)	Female (2)
Age	0.001*** (0.0017)	0.0191*** (0.0025)
Years of education dummies (1-5 years: omitted)		
6-9 years	-0.0364 (0.044)	0.0465 (0.062)
10-12 years	-0.0737* (0.044)	-0.152** (0.061)
Under-graduate	-0.258*** (0.027)	-0.375*** (0.044)
Vocation	-0.0847*** (0.028)	-0.186*** (0.046)
Child 0-5	0.0344 (0.030)	0.0743 (0.048)
Child 6-10	0.0459* (0.025)	0.0326 (0.042)
Child 11-15	0.0193 (0.021)	0.105*** (0.035)
Home	0.0929** (0.044)	0.0941 (0.072)
Other	-0.0138*** (0.0045)	-0.00716 (0.0072)
Married	0.0679 (0.046)	0.140** (0.059)
Regional dummies (Red river Delta: omitted)		
North Est	-0.0474 (0.043)	0.0548 (0.074)
North West	0.0136 (0.11)	0.0765 (0.14)
North Central coast	-0.0747 (0.046)	0.140 (0.092)
South Central coast	-0.0203 (0.044)	0.0860 (0.069)

Continued on next page

Table 5 – continued from previous page

COEFFICIENT	Male (1)	Female (2)
High Central Land	-0.0377 (0.061)	0.372*** (0.094)
South Est	-0.0495 (0.036)	0.0196 (0.057)
Mekong River Delta	0.0410 (0.047)	0.158** (0.069)
Industry dummies (Other industries: omitted)		
Trade	0.559*** (0.042)	0.762*** (0.038)
Restaurant& hotel	0.657*** (0.052)	0.629*** (0.039)
Transport & other services	0.121*** (0.038)	0.204** (0.082)
Foodd processing	0.296*** (0.083)	0.414*** (0.079)
Confection, leather & shoes	0.371*** (0.084)	0.429*** (0.071)
Observations	1290	1237

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Marginal effects are reported

Table 6: Earnings equations

COEFFICIENT	Male		Female	
	Self-employment (1)	Employees (2)	Self-employment (1)	Employees (2)
Age	0.0920*** (0.033)	0.0642*** (0.012)	0.0513** (0.024)	0.0380*** (0.013)
Age2	-0.114*** (0.042)	-0.0740*** (0.015)	-0.0593** (0.031)	-0.0327* (0.018)
Married	0.392** (0.24)	0.189*** (0.052)	-0.000491 (0.17)	0.0750 (0.051)
<i>Years of education dummies (1-5 years: omitted)</i>				
6-9 years	0.166 (0.16)	0.168** (0.066)	0.130 (0.11)	0.186*** (0.070)
10-12 years	0.407*** (0.18)	0.303*** (0.070)	0.369*** (0.12)	0.313*** (0.069)
Under-graduate	0.830** (0.40)	0.681*** (0.091)	0.872*** (0.28)	0.611*** (0.081)
Vocation	0.172 (0.15)	0.166*** (0.045)	-0.177 (0.14)	0.0764 (0.051)
Cities	0.201* (0.13)	0.301*** (0.041)	0.445*** (0.096)	0.300*** (0.041)
<i>Regional dummies (Red river Delta: omitted)</i>				
North Est	0.148 (0.22)	0.108* (0.062)	0.579*** (0.16)	0.126* (0.069)
North West	-0.207 (0.41)	0.0228 (0.14)	0.0229 (0.35)	0.150 (0.11)
North Central coast	-0.270 (0.25)	0.0228 (0.073)	0.226 (0.17)	-0.0944 (0.085)
South Central Coast	-0.0867 (0.18)	-0.0661 (0.058)	0.394*** (0.14)	-0.0486 (0.062)
Central High Land	0.0336 (0.26)	0.146 (0.093)	0.678*** (0.19)	0.0504 (0.13)
South Est	0.479*** (0.16)	0.322*** (0.048)	0.742*** (0.12)	0.325*** (0.049)
Mekong River Delta	0.0715	0.0604	0.430***	0.0691

Continued on next page

Table 6 – continued from previous page

COEFFICIENT	Male		Female	
	Self-employment (1)	Employees (2)	Self-employment (1)	Employees (2)
	(0.17)	(0.063)	(0.14)	(0.066)
<i>Industry dummies (Other industries: omitted)</i>				
Trade	0.0990 (0.45)	-0.0724 (0.11)	0.208 (0.46)	0.185 (0.11)
Restaurant & hotel	0.108 (0.50)	0.140 (0.18)	0.323 (0.44)	0.0160 (0.12)
Transport & other services	-0.247 (0.22)	-0.0954** (0.041)	0.0797 (0.32)	-0.0552 (0.052)
Food processing	0.301 (0.35)	-0.0930 (0.11)	-0.0732 (0.40)	0.159* (0.092)
Confection, leather & shoes	-0.0976 (0.39)	-0.181* (0.097)	0.0749 (0.37)	-0.0643 (0.068)
Constant	6.913*** (1.31)	7.651*** (0.21)	7.976*** (1.10)	7.955*** (0.23)
lambda	0.0146 (0.37)	-0.0677 (0.15)	0.0771 (0.27)	-0.271*** (0.10)
Observations	1290	1290	1237	1237

Standard errors in parentheses;
 *** p < 0.01, ** p < 0.05, * p < 0.1

Table 7: Absolute earnings differentials between self-employed and employees

Group	Male		Female	
	Self-employment	Wage sector	Self-employment	Wage sector
Employees	10.15	9.64	9.43	9.5
Self-employed	9.97	9.57	9.36	9.52
Difference	0.174	0.076	-0.074	-0.021
Significant test	(-6.0769)**	(3.7192)***	(-3.0032)***	(-1.2401)

Value in natural logarithms of predicted earnings at group means

***: Earnings differentials is significant as 0.01 percent

Table 8: Decomposition earnings differentials between self-employed and employees

	Male		Female	
	W = 1	W = 0	W = 1	W = 0
Explained	0.0013	-0.090	0.016	-0.068
Unexplained	0.186	0.277	-0.1542	-0.0703
\hat{Y}_s	9.818		9.356	
\hat{Y}_w	9.630		9.494	
Difference	0.188		-0.139	
z	0.76		1.24	
P > z	0.447		0.217	

\hat{Y}_s : Expected earnings of self-employed in self-employment sector

\hat{Y}_w : Expected earnings of employees in Wage/salary sector

Value in natural logarithms of predicted earnings at group means

$$W=0: \bar{Y}_s - \bar{Y}_w = (\bar{Z}_s - \bar{Z}_w)\hat{\gamma}_s + \bar{Z}_w(\hat{\gamma}_s - \hat{\gamma}_w)$$

$$W=1: \bar{Y}_s - \bar{Y}_w = (\bar{Z}_s - \bar{Z}_w)\hat{\gamma}_w + \bar{Z}_s(\hat{\gamma}_s - \hat{\gamma}_w)$$

Table 9: Structural probit equation

COEFFICIENT	Male (1)	Female (2)
DIFF	0.739*** (0.25)	-1.076*** (0.32)
Age	0.0168*** (0.0030)	0.0111*** (0.0034)
Years of education dummies (1-5 years: omitted)		
6-9 years	-0.0843* (0.043)	-0.00270 (0.064)
10- 12 years	-0.203*** (0.051)	-0.0798 (0.067)
Under-graduate	-0.376*** (0.037)	-0.159 (0.11)
Vocation	-0.122*** (0.029)	-0.384*** (0.060)
Child 0-5	0.0329 (0.030)	0.0817* (0.049)
Child 6-10	0.0362 (0.026)	0.0457 (0.042)
Child 11-15	0.00248 (0.022)	0.112*** (0.036)
Home	0.0875* (0.046)	0.0750 (0.074)
OtherINCOME	-0.0122*** (0.0046)	-0.00540 (0.0073)
Married	-0.0728 (0.078)	0.0716 (0.066)
Regional dummies (Red river Delta: omitted)		
North Est	-0.0998** (0.040)	0.431*** (0.11)
North West	0.121 (0.15)	-0.143 (0.13)
North Central coast	0.0813 (0.094)	0.381*** (0.10)

Continued on next page

Table 9 – continued from previous page

COEFFICIENT	Male (1)	Female (2)
South Central coast	-0.0187 (0.044)	0.500*** (0.11)
Central High Land	0.0206 (0.072)	0.634*** (0.034)
Southeast	-0.163*** (0.046)	0.452*** (0.12)
Mekong River Delta	-0.000995 (0.046)	0.457*** (0.090)
Industry dummies (Other industries: omitted)		
Trade	0.620*** (0.044)	0.773*** (0.037)
Restaurant	0.788*** (0.035)	0.716*** (0.028)
Transport	0.294*** (0.071)	0.347*** (0.088)
Food processing	0.0770 (0.10)	0.168 (0.13)
Confection, leather & shoes	0.460*** (0.086)	0.527*** (0.063)
Observations	1275	1222

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Marginal effects are reported