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Determinants of Female's Employment Outcomes in Vietnam

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Abstract

In the context of reducing female labor demand and restructuring female work in integration, determinants of women's employment are studied using data of 2010 VHLSS with 11,085 women aged 15 and older who were working in the Vietnamese labor market. The economic and care needs, values and opportunities of women working are important. At the region-level, economic development and equality will give women opportunities for better work. Women's education and training clearly take a key position. The analysis shows the effect of education and training are strongest and positive for women with employment in the group of "Leaders, managers, and administrators**;** High and Middle-level technicians and professionals". The finding suggests an effect of household social-economic status on women's employment achievements. Our results stress the importance of education and training as the major road towards women's empowerment in Vietnam.

Keywords: female labor demand, female employment outcomes, Multinomial Logistic Regression

Introduction

Vietnamese women have historically been economically empowered. They have a long tradition of participating actively in the labor force. In 2016, about 72.5 percent of women were part of the labor force, higher than in most of the world (GSO, 2017). Moreover, women and men are increasingly more equal, and women are better educated, independent and autonomous. Women are nowadays in professions traditionally dominated by men (GSO, 2017).

However, working women are not a homogeneous group. While some of the women take advantage of integration opportunities to get higher significant steps on the occupational hierarchy, others continue locking in the lower position of all professional and unskilled works (ADB 2005, ILO and IFC, 2012; Nguyen et al 2014). Many working women do low-paying jobs in export dependency factories (women account for 80% labor in the textile and garment industry). Most of the female labor force was supported by the self-employed and unpaid work which are not protected by social security (66.6% of informal sector labor is accounted by women) (GSO, 2017).

In order to improve the female employment outcomes, it's necessary to consider the incentives and restrictions that affect Vietnamese women's employment outcomes. However, the existing theories and empirical analyses in Vietnam are limited and fragmented. Most studies focus on limited labor types such as youth, informal workers, in which women are included (Ngo et al

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2011; Nguyen et al 2015). Other research that examines commune and individual level variables that influence wage-paid labor just focus on rural women (Phuong, 2016).

In this study, we fill the research gaps and contribute to the field in important ways. We present an encompassing social-economic theoretical framework that addresses the multitude of influences on women's employment choices. This framework distinguishes among conditions affecting women's choices that included personal labor supply and demand sides and are presented with the needs, opportunities, and values of working. It also reflects that the women's labor market isn't homogeneous. Besides, Vietnam's 2010 Household Living Standards Survey is used with 11.085 women aged 15 and older who have employment in multinomial logistic regression. Such an analysis matters because the employment difference based on gender, ethnicity, or wealth groups undermine the ability to achieve the higher quality of life for women and their families. Furthermore, the inequalities in employment attainment can have impacts on the social productivity and the full utilization of the country's resources. The research questions addressed are: What are the women's employment outcomes in Vietnam? Which factors are the (major) determinants of women's employment outcomes?

Next, the theoretical framework is made in more detail and connects with the existing literature. After discussing the data and methods, we first show descriptive figures about the variation in women's employment in Vietnam. Subsequently, the multinomial logistic regression outcomes are presented. The results section is concluded with an analysis of how the effect of women's education is shaped. We finish the paper with a discussion of the major findings and their implications.

Literature Review and Comprehensive Framework

The current Vietnamese research on women's employment is dominated by a macro-level perspective that shows the integration context factors impacting on women's labor supply and demand. Firstly, the research shows that the shift of economic activities toward the service sector and part-time employment, which favor female labor, as well as the increase in returns to education, has led to an expansion of married women and mothers' labor force participation, an increase in the opportunity cost of educated women staying out of the labor force. Foreign-invested capital in export-oriented and labor-intensive industries such as the textile and clothing or food processing industries offers opportunities including entry-level jobs for unskilled women labor in Vietnam. However, in these enterprises, severe working conditions (over-time, shift work, strict regulations, etc.) do not support women's roles in the family. Therefore, lots of them quit their job at foreign-invested enterprises and become informal workers or just do housework (Le, 1995; Bui, 1995, Nguyen et al 2011). The results in an ILO's research also show that the impact of regional integration on Vietnamese labor markets in the way of increasing in occupational demand for several unskilled and semi-skilled occupations in trade, agriculture and construction makes further increases in informal sectors. The female labor share is greater in most of the clerical occupations, the service and sale workers are the occupation groups in which females constitute the largest share, garment, and food processing industries also employ a larger share of females in integration (El Achkar Hilal, 2014).

Besides, the increasing migration trend of the male in a household, the pressure of maintaining and increasing rice productivity falls on the females and other family members. Therefore, principal females take over traditional male tasks in farming (Paris et al 2009).

Third, female employment has also resulted from enterprise restructuring, women are the first to be pushed out of the labor force in downsizing, and in a larger proportion than men. This is because of women's concentration in direct production, in most vulnerable sectors to international demand fluctuating, and in clerical/administrative occupations, attitudes towards women as secondary earners and less deserving than men of work (Le, 1995).

In the context of integration, the female employment outcomes also depend on their individual and household characteristics. Informal sector regularly relates to unskilled or untrained women labor (Ngo et al 2011).The shares of female youth workers outnumber those of men in both categories of vulnerable employment – self-employed and unpaid work. These types of work related to the low schooling level. The main reasons for these youth women's choice are "higher income possibility" and "unable to find a wage or salaried job" (Nguyen et al 2015). Variables that influence women's wage-paid labor in rural Vietnam include better education responsible for an increase while being married, having young children, and increased non-earned income, decrease employment probabilities (Phuong, 2016).

Whereas women's employment is determined by many micro-macro factors, most studies in Vietnam focus on only a few of them as shown above. Traditionally, in Neo-classical theory, consumption and labor supply decisions are modeled as though household members were maximizing a unique utility function that combination of market-derived characteristics and the members' preferences in order to determine whether a person will work or not and how much he/she will work under a budget constraint. This maximization is subject to the constraint that the family's total expenditure on the consumer goods may not exceed family's total income. When solving this problem, the decision rules of females depends on (1) the reservation wage (the lowest wage rate at which a women would be willing to accept a particular type of job); (2) the potential offered wage on the labor market (the wage rate at which the employers are willing to pay for given employees with a certain job and the appropriate ability of them) (Ehrenberg and Smith, 2012). They will decide to work if the offered wage is equal to or greater than the reservation wage. So the factors that increase or reduce their reservation/offered wage level will affect their working decisions.

However, the Neo-classical approach is based on several quite restrictive and unrealistic assumptions of perfect competition, homogeneity of workers, perfect information and labor mobility. The reality is that labor market barriers are determined by institutional, geographical, and occupational factors as well as community view of gender, and age. Therefore, the Segmented Labour Market (SLM) main hypothesis is that there is a combination of a series of distinct interconnected markets rather than one competitive market. SLM theories were developed as an attempt to explain inequality of employment opportunity and persistence of poor women's employment outcomes compared to men which competition approach failed to explain.

Specifically, the dual labor market theory (Doeringer and Piore, 1980) hypothesizes that a dichotomy has developed over time between a high-wage primary segment and a low-wage secondary segment. Working conditions in the primary segment are steady employment and job security, and the policies that govern the organization of employment are well defined. The characteristics of secondary employment are unskilled, less security, high turnover rates and few opportunities for training or advancement. Secondary jobs are filled largely by groups whose attachment is vulnerable paid-employment such as females and youths while primary segment jobs tend to be the preserve of adult males. In contrast to the personal supply-side factors that dominated by neoclassical labor market models, segmentation theory emphasizes demand side and institutional factors. Specifically, labor market segmentation arises because of the characteristics

of jobs rather than differences in worker attributes. However, the segmented labor market approach did not explain the fact that some women could take advantage of the market opportunity to move higher up the career ladder, while others did not. At this point, the supply-side approach worked. So, the competition versus segmentation approach is not really substituted for each other since they incorporate over-lapping concepts and analysis and labor market behavior consistent with both approaches can be observed in the economy.

Besides, the socialist-feminist framework examines the division of household labor, which is an inability in prior economic approaches to deal with the gender relation issue in the family. The domestic division of labor is rooted in the historical transformations of capitalism and patriarchy which set the ideological definition that family care is women's responsibility (Hartmann, 1981). Therefore, women working outside are subject to an over-burden of domestic and labor market work (Hartmann, 1981). Then women experience segregated occupation with depressing wages to overcome that burden. We also used the Women and Development approach in building the analysis framework which suggested that women have always been an integral part of development, emphasized the distinctive nature of women's knowledge, work, goals, and responsibilities, as well as advocating for the recognition of their distinctiveness (Rathgeber, 1990).

In summary, no single approach can fully explain the factors that affect the women's employment in the Vietnamese labor market. In order to overcome the problems, we have built a comprehensive model for explaining women's employment that takes the complexity and multi-layered nature of women's experiences into account, as follows:

The women's labor supply regard to the needs and value of working

Choice of women's labor supply depends on the needs and values of working. The values of working include societal norms and cultural ideas that may encourage or discourage women to work. A woman might also set a higher reservation wage when considering an offer of an unpleasant or undesirable job than when considering a type of job she likes. While the economic theories of women's employment choice assume that women form homogeneous groups, preference theory, and the socialist-feminist theory all show that working women are not a homogeneous group. Preference theory explains and predicts women's choices between market and domestic work that are based on women's lifestyle preferences (Hakim, 2002). Women choose among three different ideal lifestyles: home-centered, work-centered or adaptive that correspond to Prefer not to work, Committed to working or equivalent activities, or Want to work, but not totally Committed to working career.

To criticize, the socialist-feminist approach argues that women adjust their preferences in response to persistent gender inequality or need more power transference to make a conscious decision not to play by the current rules of the game (Leahy and Doughney, 2014). So women's labor market behavior depends not only on their own needs but also on those of their household members. Different kinds of needs can conflict with each other. At the household level, economic and leisure, care needs cannot always be reconciled and this has more effect on the female working decisions. A household income acquired by working is the major means of providing for household live needs and other goods. We expect women to choose any kind of employment if the income of the household's male(s) is not sufficient, otherwise, they will wait to find a better job. Besides economic needs, households also have care needs that may keep women from entering or staying in the labor market. Care needs depend on the number of people in the household that need care,

such as children and elderly, and on the number of household members with whom the duty can be shared.
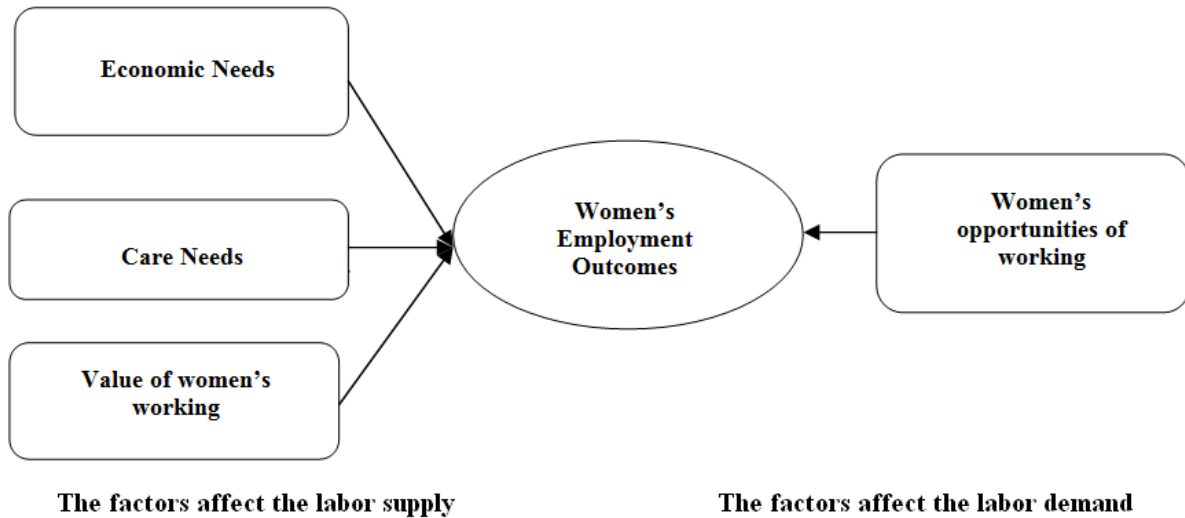
The women's labor demand with opportunities for working

If economic needs drive women towards the labor market, this does not automatically mean that they will work. Women's working decisions also depend on their potential offered wages in the labor market that are affected by their employment opportunities and abilities.

At the individual level, the importance of opportunities can be illustrated by looking at the human capital that ensures the abilities to meet the job requirements. Individual variations in human capital imply differences in earnings power and employment (Becker, 1975). Higher educated women meet the requirements of more jobs and therefore have more possibilities to work (Killingsworth and Heckman, 1986). Lifecycle labor supply model showed that women's caring roles, directly and indirectly, impact their employment in the long run. These affect the type of accumulated human capital such as experience, and training. According to Polachek (1981), since some women expected discontinuous work time, they might be willing to accumulate a lower depreciation of general human capital and enter a low-paid job to reduce the impact of time off from work to their lifetime income. Because of anticipating the women's work time interruptions, the employer will invest limited training and lower level of payment for women (Becker, 1975), women will be arranged work that requires less commitment to reduce the costs when they leave the job (Bielby and Baron, 1986). These make a vicious circle, barriers to participating in outside work and taking responsibility for caring family members.

However, more education doesn't appear correlated to more success in the labor market. Unemployment is highest among young who are most educated. This is the fact that less-educated young people begin their transition to work at an earlier age, have lower expectations about work and find a job easily. The correlation between education and unemployment may also be driven in part by an income effect, better-educated young adults are more likely to be from wealthier households, and therefore better able to afford unemployment. The positive link between unemployment and education levels is also suggestive of mismatches between the skills produced by the education system and those needed in the labor market, and the lack of mismatch between skilled job seekers and prospective employers. Education helps workers to have secure wage jobs and in the formal sector. Poorly-educated labor is much more likely to be working in jobs without wages, associated with low-productivity work in the informal sector. Self-employment is consistently more common among those with lower levels of education (UNESCO, 2013). We also hypothesized that low-level training is still the main barrier that female employees do not take advantage of the economic integration opportunities to achieve higher positions in their careers.

In addition, five of society and labor market changes, which started in the late twentieth century which produce different and new employment opportunities for women, include: (i) The contraceptive revolution from 1965, the expansion of education, the decline of fertility rates, the delay in the first birth; (ii) The equal gender revolution of opportunities in society and labor market; (iii) The expansion of professional, managerial, or administrative work (white-collar occupations) which are more suitable for women than manual work (blue-collar occupations); (iv) The role of the women as second earner, advances in household production technology, healthcare technology which has reduced the time necessary for domestic production, and child-birth, child-rearing; (v) The increase of attitudes, values and personal preferences in the lifestyle choices in affluent modern societies (Hakim, 2002).

Economic Needs

Care Needs

Value of women's working

Women's Employment Outcomes

Women's opportunities of working

The factors affect the labor supply   The factors affect the labor demand

Source: Authors' Review

Figure 1: Determinants of Women's Employment outcomes

In summary, considering the diverse nature of factors that may influence whether or not women get into better work status, we adopted a multi-perspective, taking into account several factors that have been linked in the literature to women's employment. Figure 1 illustrates the factors that we proposed would predict women's employment outcomes.

Research Methods

Data

In order to answer our research questions, we use data from 2010 Vietnam Households Living Standards Survey (VHLSS) with 11.085 women aged 15 and older who have a job. We also use the data from Labor Force Survey (LFS) in the 2000-2016 period. Both of them are household surveys using national representative two-stage stratified samples of households, and the first contains information on demographics, employment, income, and education.

Variables

a/ Dependent variable:

The dependent nominal variable represents the possibility to choose one of three occupation groups of the individual i (Y_i). It describes the outcome of stochastic occupation choice with a density function of cumulated probabilities ranging from 0 to 1. $Y_i=0$ if women are elementary workers (Group 3); $Y_i=1$ if women are Leaders, Managers, and Administrators, High-level technicians and professionals, Mid-level technicians and associate (Group 1); $Y_i=2$ if women get skill works (Group 2).

Independent variables:

➤ *The factors that affect the woman's labor supply:*

Individual and household economic needs were measured by following variables:

One indicates marital status. With regard to causes, some argue that constraints such as low male incomes have derived women into the labor market, while others point out the expanding of women's opportunities. Consequences are also contested, and the changing of women's economic role is central both to debates of gender equity and family values, and children's well-being. The Vietnamese family is a dual-working family so the married women seem to work. If their livelihood requires working, women will be willing to accept any kind of work and this increase the probability of doing unskilled work.

The other is household income levels (20% of the lowest-income households, or 20% of the highest-income households versus 60% of middle-income households). Qiuchi (2014) shows that in the low-income group, family income is positively associated with labor force participation, whereas family income is negatively correlated with labor force participation in the high-income group. Concerning occupation choices, higher family income means fewer livelihood needs that will give women opportunity to get better jobs.

Since Vietnamese men are generally considered to be the primary earner, we may expect women have less need to work and have more opportunities to choose better jobs if the head of the household is a male. This was measured by the Female-Headship variable. Female-headed households are more prone to shocks, less able to smooth their consumption or more vulnerable in the labor market than male-headed households. Therefore, there is a higher risk of women's unskilled employment in female-headed households.

Our last measure of economic needs, the working ratio, was measured by the ratio of employed people in the household to the total number of household members. This kind of variable show family support and reduce women economic needs.

Household care needs were measured by the following variables:
Care needs were measured firstly by the presence of the children and the old people in the household. The presence of small children in a household reduced the likelihood of women entering skilled employment. Besides childcare responsibilities, elderly care also reduces the employment ability of women. Accordingly, we hypothesize that fewer children or elderly people in the family (fewer care responsibilities) predicted higher skill of women's work.

Our second measure of care needs, the care ratio, was measured by the ratio of women aged over 15 to the total number of household members. The higher this ratio, the more the care responsibilities of women in a household are shared.

Value of working women
Values could not be directly measured. Instead, we use several indicators. Values of working women were measured by their education. Rising education levels are often associated with more modernist or equal views of women's role. The human capital such as the education and training attainment is also important in increasing their labor market opportunities, however, in this study, we use variable "Education" to express the values and "Training" to express the opportunities.

Another indicator of working values is the age of the women. Young women are more concerned about their own careers. Women's Age is measured by reference group that is under 30 years old, versus other age groups.

The factors that affect the woman's labor demand:

Women's opportunities were measured by variables: socio-economic status, urban/rural living region, migration situation, and Women's training.

Women's abilities were measured through their training that was present in three categories. Socioeconomic status was measured by the education level and employment of the head of the household: the head of the household's education, and employment. We expected that the high education and wage-employment of male-headed-households will help women to have more opportunities for a better job. Secondly, "Ethnic" was used to present the social-economic status of women. People with a minority ethnic background face more barriers to work and receive lower pay than Kinh/Hoa workers.

Women's migration would appear to increase the probability of employment since they likely move to the better employment opportunity areas. This may be true for single women, however, married women may lose a job opportunity or take the low skill work when they move. Therefore, whether the immigrant women have better jobs or not needs to be verified.

Employment outcomes have consistently been found to differ by region. "Region" is reflected as an important demand factor influencing labor market outcomes. The region of faster growth in "female-oriented" jobs will have higher women employment. In addition, the region where the skilled-work sector for women grows faster than unskilled-work will attract high-skill women labor. As an indicator of the availability of jobs for women, we included a dummy whether or not a woman lives in the urban region.

Model

In order to address the effects of individual, household and regional level factors on women's employment, we use Multinomial Logistic Regression analyses. This allows us to use explanatory variables at different levels simultaneously. Accordingly, the probability of a woman *i* falling into occupation group j is calculated by the formula:

$$p(Y = j|x) = \frac{e^{Z_{j(x)}}}{1 + e^{\sum_j Z(x)}} \quad (3.1)$$

In which, dependent variable, Y_i is a nominal dependent variable with 3 categories of women's occupation types with the $Y_i=0$ (group 3) as the reference. The multinomial regression model estimates two logit equations, two log odds of each category. Multinomial regression estimates two multiple linear regression functions defined as:

$$\text{logit}(y = j) = \log\left(\frac{P(Y=j|x)}{P(Y=0|x)}\right) = Z_j(x) = \beta_{j0} + \beta_{j1}X_1 + \beta_{j2}X_2 + \ldots + \beta_{jk}X_k \quad (3.2)$$

In which, js are the options of the dependent variable Y(j=1,2); X is the vector of variables measuring individual, household, and regional characteristics. β_i (i=0,k) are the regression coefficients, β_{j0} is the intercept from the linear regression equation; β_{ji} (i=0,k) is the regression coefficient associated with the kth explanatory variable and the mth outcome. The antilog of an estimated regression coefficient, exp(β_i), produces an odds ratio. The estimated coefficients in logistic regression reveals in the annex.

According to 3.1, we calculate predicted probabilities for each of outcome levels using the fitted functions.

$$p(Y=0|x) = \frac{1}{1+e^{Z_1(x)+Z_2(x)+Z_3(x)}} \quad (3.3); \quad p(Y=1|x) = \frac{e^{Z_1(x)}}{1+e^{Z_1(x)+Z_2(x)+Z_3(x)}} \quad (3.4),$$

$$p(Y=2|x) = \frac{e^{Z_2(x)}}{1+e^{Z_1(x)+Z_2(x)+Z_3(x)}} \quad (3.5)$$

The reference values that used the LFS 2016 rates were: 41% (0.41) for the proportion of unskilled-working women (group 3); 12% (0.12) for the proportion of women in leadership and high-middle technical profession (group 1), and 47% (0.47) for the proportion of women with professional and technical occupations (group 2). Using formula 3.3 to 3.5 (David W. Hosner, S.Lemeshow, 2000), we calculated the probabilities change compare to reference rates when an independent variable changes while others were constant, the results were represented in table 3.

For example, the estimated regression coefficients of "Urban" variable ("rural" was reference) in group 1 and group 2 occupation regressions were 0.5914 and 0.3495 corresponding (annex). If we take the antilog of the regression coefficient, exp(0.5914) = 1.8065, we get the unadjusted odds ratio. The odds of group 1 occupation of urban women are 1.81 times higher than rural women. Similarly, the odds of group 2 occupation are 1.42 (exp(0.3495) = 1.4183). The association between urban (rural) and incident group 1 and group 2 occupation are statistically significant (p<0.001). The estimated proportions of female labor in urban versus rural (with the proportion of rural as of 2016) that fall into occupation i (formula 3.3-3.5) showed that urban women get group 1 occupation with higher rate than rural women (17% vs. 12%), similarly, group 2 occupation was 52% versus 46%, and group 3 was 32% vs. 41%.

Results
Changes in women's employment and employment opportunities
Figure 2 shows that the ratios of female employment although increased are lower than that of men at a difference ranging from almost 7 to 9 percentage points and tends to increase in recent years. This suggests that the growth rate of men's employment is higher than women's.
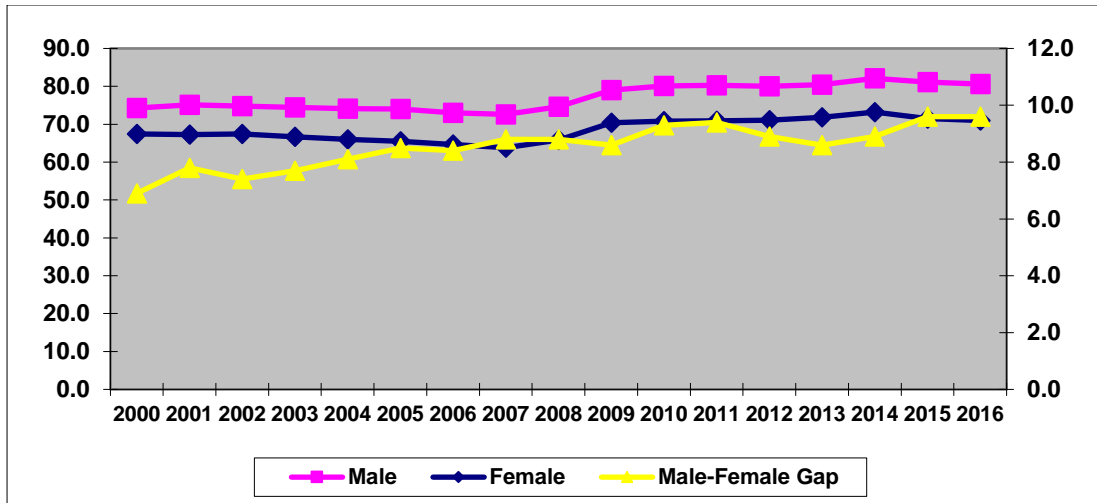
Figure 2: Employment to population ratio for people aged 15$^+$, LFS 2000-2016 (%)

According to LFS data period 2006-2016, women concentrated on the Unpaid-family work (63.2% and 66.6% respectively), the Self-employment works also increased after 10 years (38.3% and 49%). This is work which is vulnerable, unstable and offers no social insurance. While in the primary segment of jobs, women take a lower rate and have not improved in 10 years (Employer: 29.2% and 31.6% and Wage worker: 42% in the 2006-2016).

The women's employment has been improved to reduce the proportion of unskilled jobs and to increase technical and expertise work. However, compared to men, women still have a lower proportion of jobs with a leadership position and technical expert. Recently, female employees have made remarkable progress as taking advantage of the opportunities offered by economic integration, compared to 16 years ago they have accounted for a significantly higher proportion than in the group of Leaders, managers, and administrators, and High-level technicians and professionals (Table 1).

Table 1. Female employment by occupational groups, LFS 2000- 2016

Occupations	Occupation structure (%)		Rate of women (%)	
	2000	**2016**	**2000**	**2016**
Total	**100**	**100**	**49.72**	**48.5**
1. Leaders, managers, and administrators	0.2	0.6	16.57	26.1
2. High level technicians, and professionals	2.4	**7.6**	49.72	**53.7**
3. Mid level technicians, and associate	3.3	**3.5**	**56.57**	**55.6**
4. Clerks	0.9	1.9	49.72	49.2
5. Service, and sales workers	11.4	**21.2**	**68.29**	**61.9**
6. Skilled agricultural, forestry, and fishery	5.8	8.6	40.61	40.4
7. Craft and related workers	7.4	7.6	38.32	29.0
8. Plant, machine operators and assemblers	1.2	8.2	19.25	42.9
9. Elementary workers	66.1	**40.8**	**51.43**	**52.1**
10. Others	1.4	**0.1**	-	-

Clearly, economic integration does not affect equally all female workers. Which groups of female workers can take advantage of economic integration opportunities, and which ones suffer the negative impact will be explored in section 4.2.

Beginning in the 2000s, Vietnam's comparably high labor demand, a result of its heavy reliance on exports from labor-intensive industries in the early period of economic development, is argued to contribute to the long-term increase in women's employment. However, women labor demand tends to decrease in recent years.

Using L FS data, we determine the structure of the employment by occupations each year in the period 2000- 2016 and occupations structure of women employment in the base year 2016. We calculated the female labor demand rate[3]. The value of female labor demand rate (left vertical axis) and the ratio of female employment to population age 15+ (right vertical axis) were presented (Figure 3).

Observing the trend of these rates over the period 2000 to 2016, we see the change is quite similar. When the demand for female labor is reduced, the proportion of women employed is reduced and vice versa. One reason for decreasing female labor demand was the decreased share of industries that used intensive women labor in over the past decade. The employment proportion of agriculture, forestry, and fisheries has reduced from 62.2% in 2000 to 41.9% in 2016, while it tends to use more female employees than before (from 35.5% up to 50.2% in the same period).
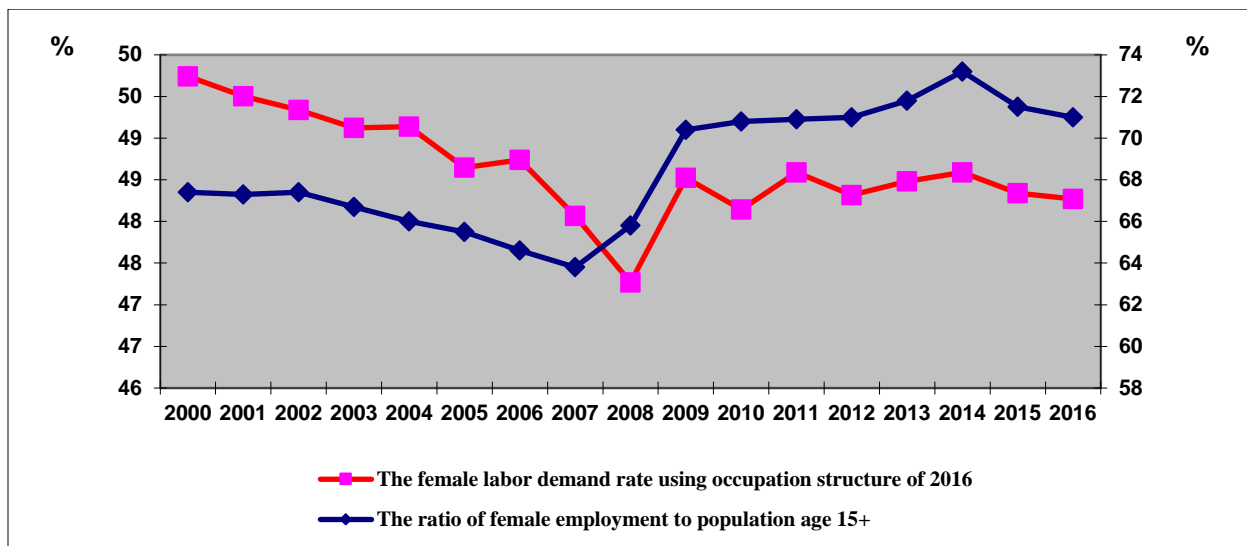
Figure 3: Female Labor Demand and Female Employment Rate, LFS 2000-2016

Conversely, the employment proportion of industry and construction tend to increase in the economy (13.0% to 24.7% in the period 2000-2016), but use fewer female workers (40.7% in 2016). However, recently the employment proportion of service industries increases more rapidly in the economy (24.8% to 33.4% in the period 2000-2016) and tend to use more female workers (51.8% in 2016). This makes the women labor demand recover gradually from 2009. The drastic

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[3] This rate is constructed by a weighted average of to trend rate of female labor demand. Besides the usual indicators reflect the fluctuations of women labor market such as the ratio of employed women in the female population aged 15+, the unemployment gap between men and women labor, we use additional indicators all occupations with the weights given by the national female share of the occupation in base year: $\mathbf{Ld^f_t} = \sum \mathbf{I^f_{i,y}} \times \mathbf{R_{i,t}}$ (%) ; In which, $\mathbf{Ld^f_t}$ is the demand for female labor of economy for a given year t (%) ; $\mathbf{I^f_{i,y}}$ is the female share of occupation i in a base year y (%) ; $\mathbf{R_{i,t}}$ is the proportion of all workers (men and women) in occupation i for year t.

changes in demand and structure of labor from joining the WTO to the economic downturn made the female labor demand fall to its lowest level in 2008 (47.3%) then was restored in 2009-2016.

As Vietnamese women's educational and training attainment have increased, women have gained incentives and opportunities to continue their careers. In Vietnam, recently around 12% of the women have attended college and tertiary education that increased from 5% (Table 2). Although tertiary education accounts for a small proportion of female workers, it accounts for the highest increase in the past 10 years because of its success with good employment.

Table 2. Percentage of trained labor force, LFS 2006-2016 (%)

	Total	Vocational training	Intermediate vocational/professional training	College	University and higher
2006					
Country	14.3	4.1	4.6	1.7	4.1
Male	16.0	5.7	4.3	1.3	4.7
Female	12.6	2.4	4.8	2.1	3.4
2016					
Country	20.6	5.0	3.9	2.7	9.0
Male	23.0	8.0	3.7	2.1	9.1
Female	18.0	1.7	4.1	3.2	9.0

For vocational training, although the attending number of female workers increase annually, the increase is mainly in primary and under three months training and in the areas of textile and garment industry, electronic assembly, tourism, personal services, seafood processing and agricultural production. The percentage of vocational training of female labor is much lower than that of men. As many as 82% of female workers are unskilled, so the skill employment opportunities for them are rare.

The factors affect the women employment outcomes

The results of the multivariate analyses are presented in Table 3. They are to a large extent in line with our expectations. For the care needs, we find significant negative effects on getting better employment where there are more young children and elderly in the household. Living in a household with the lower care ratio also has a negative influence. Specifically, the increasing of one more young child in the household will reduce the women's probability of obtaining a job in group 1 and group 2 in 1%, at 5% statistically significance. Less economic needs, like having a partner, pushed women into the group 2 occupation (49% vs. 47% at 5% statistically significant). Wealthy households versus middle-income households have higher opportunities for women to get into occupation groups 1 and 2 (21% vs.12% and 51% vs. 47% corresponding to 1% statistically significant). The rising of the employed labor ratio in the household by 10% will increase the probability of women taking jobs in group 2 from the 47% to 83% at 1% statistically significant.

With regard to values, we found that young women (under 30 years old) have more opportunities to take a group 1 occupation (12% vs. 9%-10% of women over 40 years old). Women living in a household where the head has higher education and wage-employment were more often employed in group 1 or group 2 occupation. The women's education is the most important personal-level factors that shape women's employment in Vietnam. Women who have secondary

education or higher get more opportunities in group 1 occupation than the others (22% vs. 12%, p<0.01).

Table 3. The factors affect the women employment outcomes, VHLSS 2010

Independent variable *(The reference category in parentheses)*	**Estimates of changes in the probability of women who work in occupation groups when one independent variable change while others constant**		
	Group 1 *(1)*	*Group 2* *(2)*	*Group 3(Ref.)* *(3)*
The reference rates *(2016)*	**0.12**	**0.47**	**0.41**
Economic Needs			
Marriage/Cohabitant (*Others*)	0.13	0.49**	0.37
The household belongs to the 20% richest (*60% of middle living standard household*)	0.21***	0.51***	0.28
The household belongs to the 20% poorest (*60% of middle living standard household*)	0.02***	0.37***	0.61
Head of household is male (*female*)	0.11	0.49	0.40
The employed labor ratio in the household	0.05*	0.83***	0.12
Care Needs			
Number of Children under 6	0.11**	0.46**	0.43
Number of people aged 60$^+$	0.12	0.45**	0.43
Number of women aged 15$^+$	0.13*	0.50***	0.37
Value of women working			
Group of age 30- 40 (*under 30*)	0.11	0.47	0.42
Group of age 40- 55 (*under 30*)	0.10**	0.45*	0.45
Group of age 55 and 55$^+$ (*under 30*)	0.09***	0.41***	0.50
Graduated from high school or higher (*not graduated*)	0.22***	0.43	0.35
Head of household graduated from high school or higher (*not graduated*)	0.32***	0.38	0.30
Household head wage-paid employment (*other statusé*)	0.24***	0.42	0.34
Women's opportunities			
Ethnic Kinh/Hoa (*Others*)	0.05	0.81***	0.14
Urban (*Rural*)	0.17***	0.52***	0.32
Immigrant (*non-immigrant*)	0.16	0.41	0.43
Vocational training (*No training*)	0.16**	0.46	0.38
College/University or higher (*No training*)	0.33***	0.27***	0.40

Source: Authors calculate from the estimated coefficients of MLR.

Note: (*), (**) (***) denotes statistical significance at least at 10%, 5% and 1% respectively {(*): p<0.1; (**): p<.0.05; (***): p<0.01}; (3)=(100%)-(1)-(2)
Group 1: *Leaders, managers and administrators; High an Middle level technicians and professionals*
Group 2: *Clerks; Service workers and sales workers; Skilled agricultural, forestry and fishery; Craft and related workers; Plant, machine operators and assemblers and others.*
Group 3: *Elementary workers*

Regarding opportunities, vocational and college/university training have a positive effect on the likelihood of women being employed in group 1 occupation. Living in an urban area helps women increase the group 1 and 2 occupation rates of 5% (p<0.01). Kinh women have the opportunity to work in group 2, which is 34% higher than that of minority women (statistical significance at 1%). Immigration shows no significant effect in the multivariate analysis.

In general, all three groups – needs, values, and opportunities – are important for understanding women's employment outcomes. Of those three the opportunity factors have the greatest impact on better employment in the labor market for women.

Discussion

Regarding the first research question, "What is the status of women's employment in Vietnam?", it is found that – the ratio of female employed although increased, is still lower than that of men and concentrated on work that is vulnerable, unstable and has no social insurance. Despite the work rate increase in professions, compared to men, women still have a lower proportion of leadership positions and work requiring technical expertise. Besides that, the decrease in female labor demand has reduced women's employment opportunities while most of them have not been trained in recent years.

For the second question, "Which factors are the determinants of women's employment outcomes?" we found women's employment to be formed by needs, values, and opportunities. Having less economic needs, such as women having partner or living in wealthy households or the household with the high employed ratio, create favorable conditions for women to choose higher-skilled jobs. Consequently, economic needs remain a barrier and family support is an advantage for women to obtain higher-skilled jobs in Vietnam. Besides, the care needs, due to the presence of younger children or the elderly and the lower care ratio are associated with unskilled female employment.

Considering values of women working, the results show that young women, women having the head of the household with higher education and wage-employed, more often get higher skilled work. These findings suggest that in less traditional situations, women have a higher tendency to enter the higher skilled labor market, hence traditional values still constitute a barrier to women's employment outcomes. In general, women with higher levels of education appreciate their career, so they choose jobs with higher skills. The importance of opportunities was exemplified by the existence of positive effects of the women's training and their urban living, and their ethnic background. These imply that human capital, social capital and regional development facilitate women's employment outcomes.

Our findings are in line with a few earlier studies in Vietnam. For example, the negative effect for women employment was due to the low education and lack of training of women; reflected in Ngo et al (2011); Nguyen et al (2015) and Phuong (2016). In this study, these results

are placed in a broader context and may also contribute to more general research issues. Our framework is built on labor economic theories as well as the socialist-feminist approach that does explain the complexity of women's employment outcomes in Vietnam.

Concerning policy-making, an explicit finding of this study is that education and training are substantial in increasing women's higher skill employment opportunities. Besides the importance of education and training, it should be accompanied by other policies that help women to benefit most from their educational achievement. For example, suitable labor market opportunities for women should be created. The effect of education and employment of the head of the household on women's possibilities to get a good labor market position indicates that also the education achievements of men should be stimulated (most of the head of household are men). Since care duties were found to restrict women's career and their possibilities to benefit from their education, policies aimed at increasing the availability of childcare and elderly care facilities are important as well.

Besides demonstrating policies outlined above, we should also give attention to developments taking place in economy and society. Due to globalization, the societies tend towards more modernized and less traditional arrangements. As a result, women's high-skilled employment tends to increase. However, not all developments tied to globalization benefit women. The decrease of the women labor demand in recent years might reduce women's chances of being employed. Hence, it is necessary to improve the women labor demand especially in the context of deeper economic integration.

Conclusion

Women's employment in Vietnam is studied on the basis of an assembling theoretical framework that supposes women's employment outcome to be determined by three-factor groups – needs, the value of women's working and opportunities – that may exert their influence at the individual and household level. In this research, we apply the framework to data on 11,085 women aging 15 or over in VHLSS 2010.

Altogether, as predicted by our analysis framework, women's employment choice depends on whether working is needed for living, whether a job can be acquired, and whether that kind of job is considered acceptable. We have contributed to a more complex understanding of women's employment in Vietnam and feel that our framework can provide prolific proof in larger contexts to explain the general processes shaping women's choices and position in the labor market.

When taken together, our analyses point to the importance of a further exploration of the structural bases for gender inequality in the division of domestic labor combined with the SLM approach besides the Neo-classical one. Understanding these sources will allow policies which may have a real impact on the distribution of power and remove the "double burden" from the shoulders of women as well as strengthen the capacity, skills, and knowledge for them, support them reducing the care burden.

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Annex: Multinomial logistic regression

Number of obs   =   11,085
LR chi^2(38)   =   2709.89
Prob > chi^2 =   0.0000
Log likelihood = -7056.0115
Pseudo R^2 =   0.1611

	Group 1						Group 2					
Occupation	Coef.	Std. Err.	z	P>z	[95% Conf.	Inter-val]	Coef.	Std. Err.	z	P>z	[95% Conf.	Inter-val]
Region *Rural (Ref)*												
Urban	0.591	0.106	5.600	0.000	0.384	0.799	0.349	0.056	6.220	0.000	0.239	0.460
Number of people aged 60$^+$ in the h.hold	-0.023	0.093	-0.250	0.804	-0.205	0.159	-0.088	0.045	-1.960	0.050	-0.177	0.000
Number of women aged 15$^+$ in the h.hold	0.159	0.082	1.950	0.051	-0.001	0.320	0.156	0.039	4.050	0.000	0.081	0.232
Number of Children < 6 in the h.hold	-0.128	0.053	-2.400	0.017	-0.232	-0.023	-0.056	0.024	-2.340	0.019	-0.103	-0.009
The ratio of people emloyed in the h.hold	0.454	0.247	1.840	0.066	-0.030	0.939	1.846	0.120	15.350	0.000	1.610	2.082
Women Education *Not graduated from high school (Ref)* Graduate from high school or higher	0.777	0.127	6.110	0.000	0.528	1.026	0.081	0.071	1.150	0.249	-0.057	0.220
Ethnic *Others(Ref)* Kinh/Hoa	0.130	0.159	0.820	0.415	-0.182	0.441	1.610	0.093	17.330	0.000	1.428	1.792
non-immigrant (Ref) Immigrant	0.220	0.224	0.980	0.326	-0.219	0.660	-0.186	0.133	-1.390	0.163	-0.447	0.075
Others (Ref) Marriage/Cohabitant	0.206	0.125	1.650	0.100	-0.039	0.452	0.135	0.064	2.110	0.035	0.010	0.259
Women's Age group												
Under 30 (Ref)												
Age 30- 40	-0.085	0.163	-0.520	0.603	-0.405	0.235	-0.031	0.084	-0.370	0.711	-0.196	0.134
Age 40- 55	-0.286	0.145	-1.960	0.050	-0.571	-0.001	-0.127	0.074	-1.730	0.084	-0.271	0.017
Age 55 and higher	-0.474	0.183	-2.590	0.010	-0.833	-0.115	-0.322	0.090	-3.580	0.000	-0.499	-0.146
Women's Training												
No training (Ref)												
Vocational training	0.338	0.149	2.260	0.024	0.045	0.630	0.059	0.098	0.600	0.550	-0.134	0.251
College/University or higher	1.043	0.163	6.390	0.000	0.723	1.362	-0.531	0.155	-3.420	0.001	-0.835	-0.227
Household by income *The h,h belonge to 60% of middle-income (Ref)*												
The h.h belongs to the 20% richest	0.889	0.105	8.430	0.000	0.683	1.096	0.430	0.062	6.920	0.000	0.308	0.552
The h.h belongs to the 20% poorest	-1.991	0.367	-5.420	0.000	-2.712	-1.271	-0.632	0.078	-8.150	0.000	-0.784	-0.480
Headed- household sex *Female (Ref)* Male	-0.049	0.113	-0.430	0.666	-0.271	0.173	0.071	0.060	1.180	0.236	-0.047	0.189
Headed- household education *Not graduated (Ref)* Graduate from high school or higher	1.267	0.110	11.490	0.000	1.051	1.483	0.092	0.081	1.140	0.256	-0.067	0.252
Headed-household employment *Others (Ref)* Wage employment	0.876	0.098	8.910	0.000	0.683	1.069	0.065	0.053	1.240	0.215	-0.038	0.168
Intercept	-4.070	0.345	-11.800	0.000	-4.746	-3.394	-3.900	0.183	-21.350	0.000	-4.258	-3.542