

Determinants of Qualification Mismatch in Vietnam

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Abstract

Taking advantage of the General Statistics Office 2018 and 2021 Vietnamese labor force survey data and deploying the Heckprobit model, this study points out that the subjective measurement of the qualification mismatch was significantly lower than the objective measurement method. However, the common point is that the rate of working workers having qualification mismatch is relatively high, of which nearly 50% are underqualified compared to their current jobs. Furthermore, the estimation results from the Heckprobit model show that the factors raising the likelihood of qualifications mismatch include: Men, Living with spouses, Having social insurance, Having lower education levels than high school, and Working in foreign-invested enterprises

Keywords: Qualification mismatch, Heckprobit model, Heckprobit model, Labor force survey.

Introduction

In Vietnam, the unemployment rate of those graduating from college/university or higher is 2.98% (higher than the national average rate of 2.25%), especially the youth unemployment rate (15-24 years old) is up to 7.12% (3 times higher than the general unemployment rate) (author's calculation from Labor Force Survey (LFS, 2021). Meanwhile, primary and lower secondary graduates' unemployment rates are 1.89% and 1.78%, respectively. In other words, the unemployment rate is highest in the group with the highest level of education and gradually decreases in the group with lower qualifications. Significantly, the high unemployment of university graduates and above has occurred continuously in recent years (4.06% in 2015, 4.08% in 2017, and 4.28% in 2020).

Many graduates in big cities such as Hanoi and Ho Chi Minh City need help finding suitable jobs. They have no choice but to accept untrained jobs such as receptionists, servants, part-time workers at convenience stores, sewing workers, and app-based *motorbike taxi drivers*. Etc. According to data provided by Grab, more than 930,000 *drivers are applicable* on the Grab platform to earn for their families, of which about 860,000 unemployed bachelors live on the technology platforms of companies like Grab. That means more than 90% of Grab drivers are university graduates. This data is also quite similar to the employment report of the Ministry of Labour, Invalids and Social Affairs (MOLISA) when up to 60% of university graduates who graduate from college are working in the wrong profession. Thus, the mismatch between educational level and job requirements in the labor market is quite common. While an increasing number of college graduates cannot find suitable jobs, many non-skilled jobs are available to workers in need. As a result, many highly qualified people have been working in jobs that do not require their high qualifications (over qualifications), such as transporting goods and running app-based *motorbike taxis*.

Moreover, in the context that the Fourth Industrial Revolution is taking place firmly, many people think Vietnam lacks high-quality human resources. However, the research results of the Institute for Human Research have shown that the demand for human resources with medium skills in Vietnam is much higher than the demand for high-quality human resources (Luong Dinh Hai, 2019). Thus, there have been different views when assessing the labor market's needs and the worker's qualifications. Therefore, a big question is whether Vietnamese workers have an education that is not suitable for the needs of the labor market. Furthermore, if that is the case, what are the influencing factors?

The article uses descriptive analysis methods and econometric models to identify factors affecting qualification mismatch in Vietnam.

In addition to the introduction, this article is structured into four sections. Section 1 reviews the literature on the topic of qualification mismatch both nationally and internationally to address research gaps. Section 2 will introduce the data and model specification. Finally, the estimation results and discussion are presented in Section 3. Section 4 concludes the paper and provides some implications.

1. Literature review

Qualification mismatch is a matter of great interest to policymakers, especially in developing countries, because this mismatch has tremendous impacts not only on individuals but also on the efficiency of enterprises in particular and the macro-economy in general (Quintini, 2011). These effects are usually adverse (Acemoglu and Zilibotti, 2001; Chun and Chua, 2016).

From a personal perspective, the mismatch of skills will affect employees' job satisfaction and income. A worker who does a job they do not have enough skills for will have low efficiency, low labor productivity, and difficulty getting high income. Meanwhile, highly skilled people who do simple jobs compared to their skills will create boredom, and of course, they will not receive an income level matching their skills. This mismatch affects workers' long-term skills development and earnings (Baert, Cockx, and Verhaest, 2013; Rogerson *et al.*, 2005; Clark, Joubert, and Maurel, 2014). Many studies have shown that workers who are over- or under-qualified for their job have lower incomes than those with the right qualifications (Allen and Van der Velden, 2001; Quinn and Rubb, 2006; Leuven and Oosterbeek, 2011; Pham Minh Thai, 2015).

For enterprises, inappropriate skills will reduce labor productivity and increase workers' risk of continuous job changes (Sala, 2011). Finally, for the economy, mismatched skills will increase unemployment and reduce GDP growth due to reduced total labor productivity.

There are many descriptive and quantitative analytical studies on qualifications mismatch in developing countries (ILO, 2014). However, this topic needs to be adequately studied in developing countries (Chun and Chua, 2016).

Chua and Chun's study (2016) is considered the first quantitative study to investigate the status of non-qualification in developing countries in the Asian region. The authors concluded that overeducation occurs more often in countries with less developed labor markets than in countries with developed labor markets.

Many factors affect the mismatch between the education level and the current job of employees, in which the factor related to personal choice plays an important role (Gottschalk and Hansen, 2003; Groh *et al.*, 2015).

Card, Chetty, and Webber (2007) show that the cost of information search and the household's socioeconomic status is even more critical influencing factors than innate skills. The research results of Chun and Chua (2016) also share this view when it is shown that young workers from families with difficult economic conditions tend to do jobs that require lower qualifications than their actual qualifications (overqualified). They also argue that the lack of social networks or soft skills leads to a mismatch between qualifications and jobs, even though workers have the right skills and qualifications.

The signalling theory of Spence (1973) explains quite well the phenomenon of workers having higher qualifications than the work they perform. Accordingly, information asymmetry causes workers to invest more in education as it is a good indicator of their qualifications, even if much tutoring contributes little to improving their qualifications and labor productivity.

There are few studies on the match between the education level and the current job of workers in Vietnam. Studies related to this topic include research by Nguyen Ba Ngoc and Pham Minh Thu (2014); Pham Minh Thai (2015); Nguyen Ngoc Anh *et al.* (2015); Le Thi Kim (2019), Tran Quang Tuyen *et al.* (2019); ILSSA and ILO (2022).

Nguyen Ba Ngoc and Pham Minh Thu (2014) use education level to represent workers' skills in measuring the match between qualifications and the job. They indicate that human resource training in Vietnam has yet to be linked to the market's quantity, structure, and quality needs. Specifically, many businesses have reported that students and graduates need to meet the requirements of businesses. The analysis data shows that in 2007 there were 28.6% of laborers working in jobs that were not suitable for their qualifications, of which 4.7% of laborers were doing jobs lower than their qualifications (over qualification), and 23.9% are working in jobs above their training level (under qualification). In 2013, these indexes increased significantly, with 49.8%, 5.9%, and 43.9%, respectively. Especially for unskilled workers, the rate has almost doubled.

Pham Minh Thai (2015) points out that most employees working in Vietnam's small- and medium-sized enterprises lack foreign language, computer skills, and group work. Moreover, the most significant difficulty in recruiting employees of enterprises is that only some people apply for the positions that businesses need. When analyzing mismatched qualifications, the report indicates that only about 54% of workers in the labor market are doing the right jobs that match their level of training, and this percentage tended to decrease slightly from 2007-2014. In addition, more than 85-89 per cent of workers with unsuitable qualifications are unqualified, meaning they work in jobs with higher requirements than their qualifications.

Nguyen Ngoc Anh *et al.* (2015) argues that being over-qualified tends to occur when there are not enough jobs suitable for a certain level of education of young people. The mismatch in supply and demand forces some people with advanced degrees to take on available jobs with requirements below their qualifications.

According to the research results of Le Thi Kim (2019), only 5% of Vietnamese workers are proficient in English, up to 49% have medium skills, 40% are unskilled, and only 11% have high capacity. From the business side, the study also shows that enterprises have difficulties training professional skills (43%) and training soft skills for employees (38%).

Tran Quang Tuyen *et al.* (2019) use the data from the first quarter of the 2018 labor forces survey to assess the impact of local governance and the mismatch between education and occupation on the income differences in Vietnam. This study uses a subjective measure of the mismatch between qualifications and work based on employees' personal feelings about the match between training and work. The results show that the mismatch between qualifications and work harms workers' income in all quintiles, in which the low-income group is affected more than the low-income group. The study proposes several solutions to minimize this mismatch in the Vietnamese labor market.

The most recent Institute of Labor Science and Social Affairs (ILSSA) and International Labor Organization (ILO) report (2022) also shows that the situation of workers in jobs that do not match their trained skills has improved between 2011-2019. The percentage of working matching qualifications increased from 56.9% in 2011 to 59.1% in 2019. However, this report also shows that the proportion of unqualified workers compared to the work they are doing has remained the same, even slightly increased, during the same study period. That implies that training programs have yet to keep up with the rapid changes in the labor market in Vietnam.

In summary, studies in Vietnam have shown a mismatch between the qualification level and the worker's jobs. At the same time, several studies have also demonstrated the negative impact of

this mismatch on workers' incomes. However, to date, no research have analyzed the factors affecting the qualification mismatch in Vietnam, and such a research gap needs to be filled. Therefore, this study will focus on determining the factors affecting this mismatch to fill the research gap in Vietnam.

2. Data and model specification

2.1. Data

The data used in this study is taken from the Labor Force Survey (LFS). LFS has been implemented by the Ministry of Labour, Invalids and Social Affairs (MOLISA) since 1996. Since 2007, LFS has been implemented by the General Statistics Office (GSO). The LFS has been conducted monthly and offered quarterly since 2011. This survey is conducted according to international standards and can be used to gauge the labor market dynamics quarterly. The survey results reflect how the economy can affect the labor market in Vietnam. The survey aims to collect information about activities in the labor market for people 15 years of age and older. The 2007 LFS sampling frame is based on 3% of the 1999 Census. While the 2009 to 2018 LFS sampling frame is based on 15% of the 2009 Census, the 2019-2021 LFS sampling frame is based on the 2019 population and housing census.

2.2 The method of measuring qualification mismatch

There are three ways to measure qualification mismatch: the normative method, the statistical method, and the self-assessment method. These three methods provide helpful information about a person's highest level of education in employment, occupation, and the appropriateness of different levels of education for each occupation or occupational group.

Normative approach

According to the normative approach, qualification mismatch is estimated using a classification developed by a professional job analyst, where the minimum educational attainment level is specified for individual occupation or occupational group. An employed person is considered over-/underqualified if their education level is above or below the requirements for the occupation or occupational group for which they are employed. The main advantage of the normative approach is that it is based on a job analyst's knowledge of the job's requirements. The main disadvantage is that classification based on criteria is challenging and is only sometimes available nationally. Also, the assumption that all jobs with the same occupation code are homogeneous (i.e., perform precisely the same tasks) and require the same qualification is inconsistent with reality.

Statistical approach

A statistical approach is based on the distribution of education levels in each occupation to determine the level of education required for a job. The mismatches are estimated in two ways. First, compare a worker's actual education level with the modal level of all workers in their occupation or occupational group. In this approach, the education level with the highest frequency (most common) of all employed persons in a given occupation or occupational group is used as a proxy for the level of education necessary for that occupation or occupational group. An employed person is considered over or underqualified if his or her education level is above or below the highest level of education of all employed persons in the same occupation or occupational group. Second, compare a worker's actual years of schooling with the number of years of education by

the most common qualification, the average number of years of schooling, or the median number of years of schooling for all workers in the occupation or occupational group. An employed person is considered over or underqualified if his/her completed years of schooling are greater than or less than the mean (+/- confidence interval) of all employed persons in the same occupation or occupational group.

The main advantage of the statistical method is that it is easy to apply and can estimate the mismatch using only the core variables outlined in the current LFS or other household-based surveys. Nevertheless, a significant problem with this approach is that it also assumes the uniformity of educational requirements for all jobs with the same occupation code. Similar problems exist with mean, median, or common years of schooling, given that all school years are of equal value, i.e., all workers with the same number of years of schooling are people who can be substituted for each other. Another problem with the average number of years of schooling is that there needs to be a general agreement on converting educational attainment to years of study. The mismatch rate also depends on the conversion of years of schooling by grade. Regarding confidence intervals around mean years of schooling, the arbitrariness of choosing a standard deviation (or +/- 10% of the median/mode) is also a threshold that can lead to significant differences in measuring methods.

Self-assessment approach

In the self-assessment method, the mismatch is assessed by the employee himself. There are two ways of self-assessment. The first measure is for workers to answer a self-perceived question about the fit between their education and the level of education required for their job (sometimes called the direct approach). Under this approach, an employed person is considered over-/underqualified if they consider themselves to have a higher/lower education level than is necessary to perform their current job. A second measure is for workers to answer a question about the level of education needed to obtain or perform their current job, which is then compared with their actual level of education (sometimes called the indirect method). Under this approach, an employed person is considered over-/underqualified if his or her education is above/below the expected value of the self-reported educational attainment suitable for obtaining a job. Alternatively, perform work reported by all workers in the same occupation or occupational group. The self-assessment method's main advantage is that it considers the heterogeneity of jobs because respondents are most knowledgeable about their jobs and the tasks they require. The main disadvantage of this method is the subjectivity/perception of the respondents. An evaluator of the education required to do their job may not be a good fit for someone else doing a similar job. In addition, estimates will depend on the exact wording of the question. Some argue that a measure based on the level of self-assessment of education required to perform a job is better than a measure based on the level of education required to get the job. Others argue that self-assessments of over- or under-qualified are more problematic than measures that assume homogeneity across occupational/occupational groups.

2.3 Applied method of measuring the match between qualifications and work in the study using labor force survey data

Subjective measurement method (according to respondents' perception)

Using information from the LFS 2018 questionnaire on workers' self-assessment of the relevance/relevance of their highest degree to their current salaried job. Specifically, question 51,

section IV asks: “*Is your job suitable for the industry/occupation you have studied/trained in?*” And the answer is: yes; no; don't know; and untrained. The self-assessment question of employees about the appropriateness between the occupation studied and the job is one of the measures of cross-sector employment in education research (Flisi *et al.*, 2017; Tran Quang Tuyen *et al.*, 2017).

Objective measurement method

In Vietnam, most data sets related to the labor market or household expenditure have questions about educational attainment (the highest level achieved by individuals), so this study will also use educational attainment to measure the qualification mismatch of workers in the labor market. Accordingly, the ILO divides nine occupational groups in the International Standard for Classification of Occupations (ISCO). Next, the ILO (2012) converted the educational level corresponding to each of these basic occupational groups based on the International Classification of Educational Qualifications (ISCED) (Table 1).

Table 1: Occupational classification and equivalent educational level

Code	Occupational classification	Equivalent educational level
1	Manager	University and upper Professional College Vocational colleges
2	Professionals	
3	Technical and Associate Professionals	
4	Clerical support workers	Professional secondary school Vocational secondary schools Upper secondary school
5	Services and Sales workers	
6	Skilled Agricultural, Forestry and Fishery workers	
7	Craft and related trades workers	
8	Plant and machine operators and assemblers	Vocational training Lower secondary school Primary School
9	Elementary occupations	

Source: ILO (2018), Table 1, page 11.

According to this classification, the unsuitable qualification factor is divided into three subgroups: (i) well-matched; (ii) under-qualified compared to current occupation (under-qualification) and (iii) over-qualified compared with current occupation (over-qualification). Workers who are considered well-matched for their current occupation are doing jobs equivalent to their qualifications, as classified in Table 1. Those considered under/over-qualification for their current occupation when the occupation they are doing is higher than their highest level, and conversely, those with a higher professional level than the group of occupations they are doing required are considered above the level compared to the current occupation. For example, a university graduate working as a service and salesperson is considered over-qualified. Conversely, a person who graduated from lower secondary school but is working as a processing supervisor will be regarded as under-qualification for the current occupation.

2.4. Model specification

This study uses a two-step Heckman model applied to the unit probability model (Heckprobit). The Heckman model, first introduced in 1976, is used to overcome the problem of sample selection bias. The sampling bias occurs when data for a variable in the model are missing in some cases, and those missing data represent other factors. For simplicity, we consider only the Heckman model with one independent variable:

$$Y_1 = \beta_0 + \beta_1 X + \delta \varepsilon \quad (1)$$

Where X is the independent variable, Y_1 is the dependent variable and ε is the error terms (ε follows the normal distribution with mean 0 and variance equal to 1).

With similar data for equation (1), we define the selection equation as follows:

$$Y_2 = \alpha Z + \delta \quad (2)$$

Which δ also follows the normal distribution with mean 0 and variance 1. Z is the independent variable in the selection equation and α is the estimate coefficient of Z .

Let T be a scalar quantity representing the selection threshold. The value of Y_1 is observed only in some cases (selected cases) and is missing in other cases (censored cases). The data is selected if $Y_2 > T$ for that case and the data is censored if $Y_2 \leq T$.

Heckman (1979) observed that if only selected cases are used for estimator (1), there is a possibility that the estimate is biased. Therefore, Heckman calculated the conditional expectation of Y_1 under the observed condition Y_1 by the formula:

$$E(Y_1 | Y_2 > T) = \beta_0 + \beta_1 X + \sigma \rho_{\varepsilon \delta} \lambda(T - \alpha Z) \quad (3)$$

Where:

$\rho_{\varepsilon \delta}$ is the correlation between ε and δ , and λ is the converted Mills ration calculated according to the following formula:

$$\lambda(T - \alpha Z) = \frac{\varphi(T - \alpha Z)}{[1 - \Phi(T - \alpha Z)]} \quad (4)$$

$\varphi(T - \alpha Z)$ is the probability density function calculated at $(T - \alpha Z)$ and $\Phi(T - \alpha Z)$ is the cumulative normal distribution function (area under the normal distribution) at $(T - \alpha Z)$. Therefore, in the case of selection, the original regression equation is no longer relevant because it lacks an independent variable in the equation. This independent variable is $\lambda(T - \alpha Z)$ and its coefficient is an estimate of $\sigma \rho_{\varepsilon \delta}$. If $\lambda(T - \alpha Z)$ actually correlates with X and Y_1 , then instead of estimating:

$$Y_1 = \beta_0 + \beta_1 X + \delta \varepsilon \quad (5)$$

We will estimate $Y_1 = \beta_0 + \beta_1 X + \sigma \rho_{\varepsilon \delta} \lambda(T - \alpha Z) + \sigma' \varepsilon'$ (6)

where ε' has a mean of 0 but is not normally distributed and σ' is a coefficient and is not necessarily equal to σ .

Heckman (1979) pointed out that *the estimated values can estimate $T - \alpha Z$* in Probit analysis where the independent variable is Z and the dependent variable is a dummy (zero if Y_1 is missing and 1 if Y_1 is not missing).

Thus, Heckman's two-step correction includes:

Step 1: Estimating Probit regression to estimate the value of $T - \alpha Z$ for each observation in the sample and then calculate the inverse Mills ratio¹ $\lambda(T - \alpha Z)$ from the estimates for each observation in the sample.

Step 2: Regression of the equation $Y_1 = \beta_0 + \beta_1 X + \beta_2 M + \sigma' \varepsilon'$ (7)

$M = \lambda(T - \alpha Z)$ and $\sigma' \varepsilon'$ is the error terms. Means to use $\lambda(T - \alpha Z)$ as an independent variable added to equation (1) to obtain an estimate of the β to find.

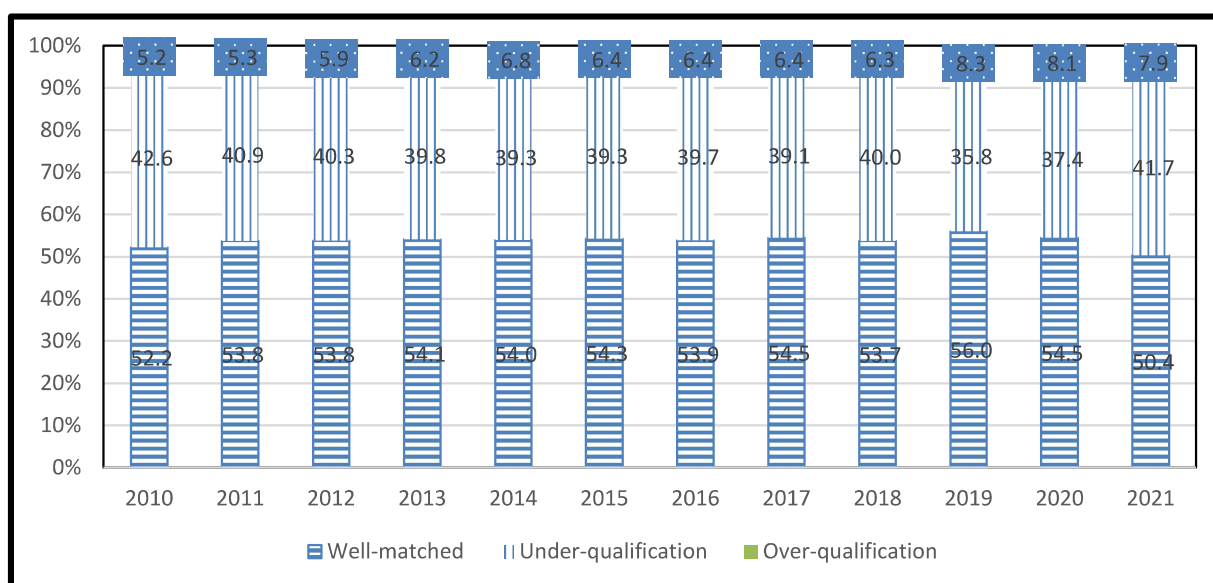
However, the regression in step two above applies to the OLS linear regression model when the dependent variable is continuous (e.g., salary, income...). When the dependent variable continues to be binary (binary - only has a value of 0 or equal to 1), then step two will continue to rerun the Probit model to get the results of correcting the selection bias phenomenon. Then, as analyzed in the model specification, the Heckprobit model will be applied to overcome the selection bias phenomenon in the analyzed sample. The statistical description of the variables used in the Heckprobit model is presented in Appendix 1.

3. Results and discussions

Figure 1 depicts the general picture of the qualification mismatch in Vietnam for 2010-2021. Accordingly, the proportion of workers doing jobs that are not suitable for their qualifications decreased slightly from 47.8% in 2010 to 45.5% in 2020 but increased significantly to 49.6% in 2021. Over-qualifications increased from 5.2% in 2010 to 7.9% after 11 years, whereas the proportion of under-qualifications decreased from 42.6% to 41.7% in the same period. It means that the proportion of workers doing jobs with the right qualifications decreased in 2010-2021, with the corresponding rates from 52.2% to 50.4%.

Thus, by 2021, about 50% (about 25 million) of Vietnamese people in the current labor force will be working in jobs that are not suitable for their qualifications, of which nearly 50% of the labor force (about 25 million people) are not qualified to do their jobs.

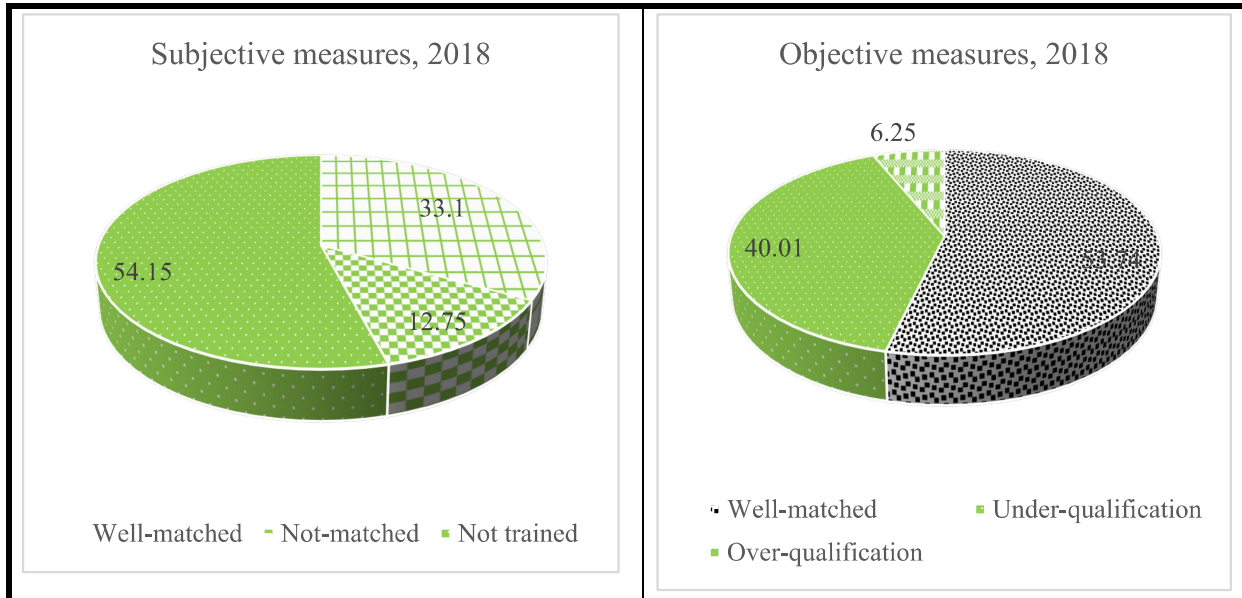
Figure 1: Qualification mismatch, objective measurement, 2010-2021



Source: Author's calculation from LFS data, 2010-2018, GSO.

Figure 2 compares the measurement results of the match between qualification level and the work Vietnamese workers were doing in 2018. The results show a significant difference between the two measurement methods.

Figure 2: Qualification mismatch, objective vs subjective measures, 2018



Source: Author's calculation from LFS data, 2018, GSO.

Measurement results by objective method show that 54% of Vietnamese workers are qualification-job well-matched. However, the percentage of workers doing jobs requiring higher qualifications is up to 40%. That means up to 40% of workers lack the qualifications to take on the work they are doing. Such a high rate of under-qualification can be a reason for the low labor productivity of Vietnam. However, there are also more than 6% of workers who are over-qualified for the jobs they are doing.

The subjective measurement results are different from the objective measurement results. Specifically, only 33% of workers think that their work is well-matched. 13% consider it inappropriate, and up to 54% respond that they are not trained for their current jobs. In cases that include untrained workers, the total percentage of workers who are doing jobs that are not matched to their qualifications in Vietnam, according to the subjective measurement method, is 67% (equivalent to more than 36 million workers). Thus, compared with the objective measurement method (the mismatch rate is 46%, equivalent to about 25 million employees), the subjective measurement method gives significantly higher mismatch results. This is common because, as analyzed, the disadvantage of the subjective measurement method is that it depends a lot on the respondent's perception.

Meanwhile, according to the personality of Vietnamese people, especially young people, they tend to be shy when answering direct questions like these. At that time, they will often raise their job position and be "modest" when assessing their qualifications. Because of these disadvantages, the following quantitative analysis will apply an objective method to measure the match between the qualifications and the work.

Empirical results

When determining factors affecting the mismatch between educational attainment and employment, the econometrics theory has shown a selection bias because only employed workers are observed. Therefore, we will only observe this fit for those in the labor market. Moreover, up to 25% of workers do not participate in the labor market, so if this group is ignored, the individual estimates for the labor market group will not accurately reflect the population's behavior as a whole labor market in Vietnam. The selection bias phenomenon is due to sampling presented in the model determination section above. Therefore, the study applied a Heckprobit model, a two-step Heckman model with the binary dependent variable (1 if the qualifications are suitable and 0 if the qualifications are not matched), to overcome the selection bias issue. Accordingly, the Heckprobit model estimates two sequent steps. Step one runs the Probit model to determine the factors affecting the qualifications mismatch and calculate the inverse Mills ratio (bias correction factor). Step 2 continues to run the Probit model with the proposed factors but controls for the inverse Mills ratio estimated from step 1. The estimated results using the marginal effects are reported in Table 2.

Table 2 reports the change of the marginal effect when the independent variables (mostly -dummy) change from zero to 1, or in other words, the change in the marginal effect when the independent variable changes compared to the reference group. According to Table 2, the estimates with three asterisks *** have statistical significance at 1%, **, and * are equivalent to the 5% and 10% significance levels, respectively.

Although the age factor of workers has no impact on the overall population, it clearly impacts the mismatch in qualifications when analyzing male and female workers separately. The estimated coefficient of the model to adjust for selection bias due to sampling (Heckprobit) for the age factor and the squared age of workers is not statistically significant. However, the age factor reduces the suitability of male workers and increases the suitability of female workers. According to the estimated results in 2018, for every 1-year increase in age, the probability that a male worker has a suitable qualification decreases by 0.6 percentage points, and the result in 2021 is 0.5 percentage points.

Table 2: Factors affecting the qualification mismatch of employed workers (estimated marginal effects of Heckprobit)

	2018			2021		
	All	Male	Female	All	Male	Female
Individual characteristics						
Age	-0.000545	-0.00565***	0.0026801***	0.000998*	-0.00471***	0.00513***
Age2	6.55E-06	0.0000515***	-0.000019***	-0.000005	0.0000457***	-0.0039***
Male	-0.04894***			-0.0620***		
Married	-0.00902***	-0.01552***	0.009388***	-0.00772**	-0.0160***	0.00684*
Urban	-0.000119	-0.0033353	0.0048876*	-0.0079***	-0.00694**	-0.00827**
Informal Employee	0.016579***	-0.02013***	0.06297***	0.000729	-0.0170**	0.0422***

Qualification (Reference group is High school)						
No qualification	- 0.228204** *	-0.22538***	-0.225876***	-0.391***	-0.362***	-0.426***
Primary	- 0.317441** *	-0.31609***	-0.31199***	-0.453***	-0.429***	-0.481***
Secondary	-0.37509***	-0.386203***	-0.356139***	-0.519***	-0.503***	-0.539***
College	-0.31936***	-0.308116***	-0.310414***	-0.287***	-0.276***	-0.316***
University ++	0.1230378* **	0.047804***	0.205729***	-0.119***	-0.142***	-0.122***
Economic regions (Reference group is Red river Delta)						
Northern Uplands	0.0237235* **	0.0532381***	-0.0030419	-0.00602*	0.0128**	-0.0327***
Centre Coast	-0.10634***	-0.06597***	-0.14051***	-0.0664***	-0.0474***	-0.0810***
Central Highlands	-0.12241***	-0.095823***	-0.14111***	-0.0492***	-0.0197***	-0.0832***
South East	-0.11644***	-0.09015***	-0.13447***	-0.0632***	-0.0389***	-0.0845***
Mekong delta	-0.12824***	-0.0909***	-0.15822***	-0.0491***	-0.0292***	-0.0659***
Business sectors (Reference group is Agricultures)						
Manufacturing	-0.25328***	-0.25084***	-0.2017***	-0.173***	-0.148***	-0.170***
Trade	-0.22914***	-0.19881***	-0.216758***	-0.188***	-0.140***	-0.207***
Services	-0.21301***	-0.19738***	-0.194598***	-0.143***	-0.112***	-0.143***
Ownership (Reference group is State)						
FDI	-0.03133***	-0.03510***	-0.03106***	-0.149***	-0.128***	-0.233***
Private	0.03230***	0.00499	0.019021***	-0.0640***	-0.0686***	-0.158***
Household Business	0.027238** *	-0.0127145*	0.0686713***	-0.0375***	-0.0411***	-0.114***
Individuals	0.20522***	0.103969***	0.331123***	0.109***	0.0551***	0.103***
Employment status (Reference group is Employers)						
Self-employed	-0.16502***	-0.14151***	-0.19324***	-0.0701***	-0.0276***	-0.106***
Family workers	-0.21393***	-0.14635***	-0.2888***	0.118***	0.0846***	0.116***
Cooperatives	-0.11662***	-0.10816***	-0.179006***	0.0290	-0.0666	0.157
Waged workers	-0.1065114	-0.1648907*	0.072591	0.194***	0.164***	0.233***
Observations	456,642	234,267	222,375	403,957	212,312	191,645

Notes: Statistical significance level *** at 1%, **: 5%, *: 10%, respectively.

Source: Author's calculation from LFS 2018 and 2021 data, GSO

However, the reduction trend is inappropriate when the age increases only up to a specific limit. The trend will increase after that (the estimated coefficient of the age factor has a negative sign (-), and the estimated coefficient of the age factor is negative) age squared has a positive sign

(+)). The U-shaped relationship means that when a worker is young, the likelihood of a worker getting a suitable job decrease, but once the age limit is crossed, it increases one age, and the tendency for workers to get jobs suitable for their qualifications has increased. This result is entirely consistent with real life when young workers who have just entered the labor market with little work experience will only have a few opportunities to do jobs that match their education level. Over time, when they have accumulated enough experience and social connections, these people will move to more suitable jobs. The estimated results in 2018 and 2021 are statistically significant for male and female workers, with the result being an inverted U-shaped relationship.

Unlike Diem and Wolter (2014), who said that the gender factor does not have much impact on the difference in the assessment of the appropriateness between qualifications and work, the gender factor plays a huge role in determining the quality of work, explaining the qualification mismatch in Vietnam. Compared to women, male workers tend to be about 4.9 percentage points lower in getting a job matching their qualifications in 2018, and this figure is 6.2 percentage points in the 2021 estimate. It is more likely that female workers tend to be higher than men in working as office workers and personal service workers in the group of workers with low qualifications, so they have a better match between qualifications and jobs than male workers. The finding is consistent with job and gender characteristics.

Compared with workers who are not in marriage, the workers living with a spouse tend to have a lower match, except for female workers. Usually, married people are under more pressure to earn income to ensure a living for themselves and their families. Therefore, this group of workers tends to accept more different jobs and sometimes even jobs unsuitable for their qualifications. Particularly for female workers, the estimated results show that the marriage factor is statistically significant at 1%. Furthermore, it shows that compared to other single women, female workers in a marriage tend to have suitable employment 0.9 percentage points higher in 2018 and 0.7 percentage points higher in 2021.

While the urban factor was statistically insignificant in explaining the mismatch in qualifications in 2018, the results in 2021 were statistically significant for both the general market and specifically for male and female labor groups. Specifically, compared with rural areas, workers in urban areas tend to have a lower match of qualifications with their current jobs, about 0.8 percentage points lower.

Those without social insurance tend to have higher qualifications matched than those with social insurance, and this is also true for female workers in 2018 and 2021. Specifically, compared to the labor group having social insurance, the female workers without social insurance tend to have the appropriate qualifications 6.3 percentage points higher in 2018 and 4.2 percentage points higher in 2021.

The qualification factor has quite a clear impact on the matched of workers' qualifications in 2018. Accordingly, the higher the education level, the more likely it is that workers with appropriate qualifications will increase, especially with the university group and above, with a statistical significance of 1% in 2018. Compared with the reference group, which is the group with high school graduation, the groups with lower education have the estimated results bearing the mark negative (-), which means that workers with lower qualifications than high school tend to have lower qualifications matched. In contrast, workers with a university degree or higher have a positive estimate (+) and are statistically significant at the 1% level. That means that workers with a university degree or higher tend to have higher well-matched than the group who only graduated

from high school. When separating models for men and women, similar estimation results are obtained. Again, the role of education is confirmed in influencing better job performance in the labor market. However, the estimated results in 2021 differ from the results of 2018. Accordingly, compared to workers with upper secondary education, all workers with lower or higher qualifications tend to have jobs with lower well-matched qualifications and work they are doing. This result is quite exceptional and requires in-depth studies to have satisfactory explanations.

Regarding the economic sector factor, the estimated results show that, compared with workers in agriculture, those working in the manufacturing, construction, trade, or service industries tend to have lower appropriate levels. The estimated results have a high statistical significance (1%). Specifically, compared with workers in the agricultural sector, workers in the three industries of manufacturing, commerce, and services tend to have lower appropriate qualifications of 17.3, 18.8, and 14.3 percentage points in 2021, respectively. Similar results were when separated into two groups of male and female workers. This result does not help to conclude which industry is better. However, it can also help infer that workers in the agricultural sector have a higher level of suitability because workers working in the industry have tended to be selective at the outset of the learning process.

The ownership factor has different effects. Compared with workers in the state sector, workers in the FDI tend to have lower appropriate qualifications. In contrast, workers working in the private sector, individual business households, and agro-forestry-fishery households have higher appropriate qualifications than those working in the public sector. The result can be explained by the fact that to work in the public sector requires quite a high level of qualification when applying for admission or entrance exams, while working in the private sector, individuals and individual business households do not require a high level of education. Therefore, matching qualifications in the non-state sector will tend to be higher because workers are not pressured for certificates and qualifications.

Finally, regarding the job position, the 2018 estimates show that compared to the group of employers, those working in other positions tend to have low relevant qualifications. That holds for both male and female worker groups when analyzed separately. In particular, while the estimated coefficients of other position groups are statistically significant at 1%, the salaried workers alone are not statistically significant (except for the group of male workers with statistical significance at 10%). However, the results in 2021 were significantly different, as family and salaried workers tended to have a higher match between qualifications and jobs. Such well-matched indicates a better development trend in the labor market, especially for salaried workers.

4. Conclusions and implications

Although there is an increasing trend, the proportion of workers with qualifications suitable for their jobs in Vietnam is only about 50%. In other words, up to 50% of laborers work in jobs with lower qualifications than the job requirements. Such under-qualification is an issue that needs to be carefully analyzed because the mismatch between qualifications and jobs negatively affects not only the employees but also the employers and the whole economy. Furthermore, the lack of qualifications compared to the current job can also explain the low labor productivity of Vietnamese workers.

For the first time, data from the LFS 2018 have directly asked employees about the match between their qualifications and work. The results show that only one-third of workers think their

qualifications are suitable for their job, and up to 54% respond that they are not trained. Although there is a significant difference between the two measuring methods of qualifications mismatch, the results show that the proportion of untrained and unqualified workers compared to their current jobs in Vietnam is quite large (about half of the people are working). Such a phenomenon is a big challenge for Vietnam in the next period, especially in the context of deep international economic integration and under the impact of the fourth technological revolution.

Quantitative analysis results in 2018 and 2021 show that factors such as age, gender, marital status, social insurance coverage, education level, economic sector, ownership form, and job position significantly impact the qualification mismatch of workers for the job they are doing. Accordingly, men tend to have a lower matched level than their female counterparts, and the same holds for those living with a spouse compared to those who are single. Moreover, urban factors and social insurance reduce the probability of having a more suitable match.

In addition, education level plays a critical role when the estimation results show that the higher the education level, the better the match between education level and job performance. This result provides further evidence that the quantity and quality of the education and training system for human resources must continue to be improved in the new context. Moreover, workers must also continue to improve their self-study skills and lifelong learning to meet the constantly changing requirements of the labor market. That will increase the well-matched qualifications and jobs, and that will increase employee income, increase enterprise labor productivity, and at the same time, increase the general income of the whole economy.

Furthermore, living in more economically developed regions also increases the propensity to have a job-appropriate qualification compared to less developed regions. Such evidence implies that it is necessary to continue to improve the infrastructure system, especially transport and telecommunications infrastructure, to increase the connection and trade between the developed regions and the surrounding areas, thereby reducing the qualification mismatch in Vietnam. Finally, compared with employees working in the public sector, those working in the private sector, household business, and households working in agriculture, forestry, and fishery tend to have lower qualifications matched.

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Appendix

Appendix 1: Description of variables in the model

	Obs.	Mean	Std. Dev.	Min	Max
Mismatch	406,657	0.5147803	0.4997821	0	1
Age	624,259	43.40001	17.44224	15	113
Age2	624,259	2187.792	1677.365	225	12769
Married	624,253	0.699146	0.4586297	0	1
Urban	624,259	0.4339385	0.4956171	0	1
Informal Employee	405,629	0.7274381	0.4452779	0	1
No qualification	624,254	0.1350027	0.3417268	0	1
Primary	624,254	0.2058569	0.4043267	0	1
Secondary	624,254	0.313869	0.4640642	0	1
High school	624,254	0.1736296	0.378791	0	1
College	624,254	0.0743543	0.2623469	0	1
University and Upper	624,254	0.0972873	0.2963488	0	1
Northern Uplands	624,259	0.225871	0.418155	0	1
Rea River delta	624,259	0.1753519	0.3802681	0	1
Centre Coast	624,259	0.2069846	0.4051447	0	1

Central Highlands	624,259	0.0817705	0.274015	0	1
South East	624,259	0.1221352	0.3274422	0	1
Mekong delta	624,259	0.1878868	0.390622	0	1
Agricultures	403,958	0.3041529	0.4600483	0	1
Manufacturing	403,958	0.2846781	0.4512616	0	1
Trade	403,958	0.1600364	0.3666403	0	1
Services	403,958	0.2511325	0.4336651	0	1
States	405,915	0.1155537	0.3196894	0	1
FDI	405,915	0.0558319	0.2295971	0	1
Private	405,915	0.1428427	0.3499128	0	1
Household Business	405,915	0.3305421	0.4704089	0	1
Individuals	405,915	0.3552295	0.4785834	0	1
Employers	409,454	0.0232969	0.1508449	0	1
Self-employed	409,454	0.3534805	0.4780508	0	1
Family workers	409,454	0.1307522	0.3371295	0	1
Cooperatives	409,454	0.0002198	0.0148242	0	1
Waged workers	409,454	0.4922507	0.4999406	0	1

Article history

Received on 12 October 2022.

Revised on 2 November 2022.

Accepted on 25 November 2022.

Notes:

¹The inverse Mills ratio, named after John P. Mills, indicates the ratio of the probability density function to the cumulative distribution function of a distribution.

Corporate Social Responsibilities towards the Community during the Covid-19 Pandemic: The Case of Vietnam

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Abstract

This research aims to shed light on corporate social responsibility (CSR) towards the community in the context of Covid -19 pandemic. This study argues that while many businesses fulfil their mission and commitment to the community; nevertheless, a large number of businesses have not actively implemented social responsibility because this responsibility has not been legalized in Vietnam. From the research results, the author proposes main recommendations to improve further the effectiveness of corporate social responsibility activities in the years to come.

Keywords: Corporate social responsibility (CSR), Community, Covid-19 Pandemic.