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Local governance and occupational choice among young people: First evidence from Vietnam

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ABSTRACT

Using data from the School-to-Work Transition Surveys 2015 (SWTS 2015), the Enterprise Census data in 2014 (ECD 2014), and the Provincial Competitiveness Index 2014 (PCI 2014), this paper examines for the first time the effect of individual and family characteristics, firm agglomeration, and the quality of labour training (provided by provincial governments) on occupational choice among young people in Vietnam. Interestingly, we find that women were more likely than men to have better jobs, even after controlling for all other variables in the models. Higher levels of education were the most important factor in choosing non-manual jobs, while family background (as measured by the father's occupation) plays a significant role in explaining young people's occupational choice. More importantly, it was found that the quality of labour training increases young people's chances of gaining better jobs. In addition, living in urban areas, the provincial GDP per capita, and firm agglomeration were also found to improve the probability of youth choosing better jobs.

1. Introduction

Every year in Vietnam, hundreds of thousands of young people join the labour market, including about 80,000–90,000 college graduates and over 150,000 university graduates (Nguyen, Nguyen, Nguyen, Trinh, & Nguyen, 2015). These young workers offer a great potential source of economic development in Vietnam because a better-educated *labour force is a prerequisite for* a country wishing to attract increased investment and stimulate economic growth (The United Nations Economic and Social Commission for Asia and the Pacific [ESCAP], 2006). While the shift from a centrally planned economy to a market-oriented one has created new and more numerous job opportunities in Vietnam (Reerink & Lim, 2013), the country still faces challenges in supplying an adequate number of suitable jobs for its increasingly educated workforce (Nguyen et al., 2015).

Official data show that the 15–24 age group has always had the highest unemployment rate in Vietnam (Youth Career Initiative, 2014). The youth unemployment rate (for people aged from 15 to 24) increased from about 6% in 2013 to about 7.30% in the first quarter of 2017, more than three times the general unemployment rate (2.10%) (General Statistical Office [GSO], 2017). In addition, the number of unemployed youth made up about 48.0% of the total unemployed population (GSO, 2017). Of these, the urban share was found to be lower than that in rural areas (45.3% versus 54.7%). The number of underemployed youth made up 21% of the total under-employed population (GSO, 2017). Youth unemployment and underemployment have resulted in substantial costs to Vietnamese society *economically*, *politically*, *and socially* (Doan, Le, & Tran, 2017; Nguyen et al., 2015). The higher unemployment and underemployment rate among young, better educated workers in Vietnam can be attributed to the oversupply of educated workers, a lower demand for educated workers due to slowing economic growth, distortion in the labour market, and mismatched, poor quality training (Doan et al., 2017; Nguyen et al., 2015).

The quality of employment among young people raises another concern. The 2013 data show that a major proportion (76%) of employed youth worked in the informal sector and nearly one-half of these young people were wage workers without a written contract (45%). Many were engaged in manual occupations, contributing about 36% of total employed youth, while jobs requiring sophisticated skills, such as legislators, senior officials and managers, professionals and technicians and associate professionals together accounted for only 12% of overall youth employment (Nguyen et al., 2015). To date, there has been no

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study investigating factors influencing the choice of occupation among young people in Vietnam. Thus, a thorough understanding of what barriers hinder youth from obtaining better jobs is very important when designing policy interventions for this group. The current study was conducted to fill this gap in the literature.

How to provide the best training for young people and the necessity of improving the linkages between education and industry are the subject of policy debate in Vietnam (Centre for Labour Marker Studies, 2009). In order to ensure all Vietnamese young people, have gainful employment, education and training systems must equip youth with the skills to match the labour demands of local enterprises (Centre for Labour Market Studies, 2009; Nguyen et al., 2015). Over the past decades, in an attempt to satisfy the labour demand of local firms, provincial governments have promoted vocational training and skills development for local industries and have assisted in the placement of local labour.[1] This suggests that the quality of labour training (provided by provincial authorities) may have a significant effect on occupational choice among young people in Vietnam. Thus, among potential factors associated with occupational choice, the quality of labour training is the focus of the current study.

The current research has two main merits. First, we provide the first econometric evidence on factors associated with occupational choice among young people in Vietnam. Second, while this study examines what individual and household characteristics are associated with job choice, it also takes into account a number of contextual factors, such as the quality of labour training (provided by provincial governments), the provincial gross domestic product (GDP) per capita, firm agglomeration at the district level, and the regional variable. Interestingly, we find that women are more likely than men to have better jobs, even after controlling for all other variables in the models. Higher levels of education were the most important factor for non-manual jobs while family background (as measured by the father's occupation) plays a significant role in explaining the occupational choices of Vietnamese youth. More importantly, the study finds that the quality of labour training increases young people's chances of securing better jobs. In addition, living in urban areas, the provincial GDP per capita and firm agglomeration are also found to improve the probability of youth obtaining better jobs.

The structure of this paper is as follows: Section 2 gives a literature review. Details of the data and methods used are reported in Section 3. Section 4 discusses the empirical results, and Section 5 contains a brief conclusion and policy implications.

2. Literature review

There have been many attempts to classify and analyze the various occupations that exist in the labour market (Ham, Junankar, & Wells, 2009). Occupations can be classified by social status (Jones & McMillan, 2001; Le & Miller, 2001), Holland's six occupational types (Rosenbloom, Ash, Dupont, & Coder, 2008), ranking occupations according to whether they are skilled, unskilled, semi-skilled, etc. (Darden, 2005), attempting both objectively and subjectively to define good jobs and bad jobs (Junankar & Mahuteau, 2005), by the quality of employment as measured by formal or informal agreements (work with or without a written employment contract) (Nguyen et al., 2015), and by distinguishing the farm and nonfarm economic sectors (Tran, Lim, Cameron, & Vu, 2014b).

Economic theory confirms that individuals differ in both their working capabilities and their career preferences for the varieties of utility and disutility in the labour supply. As a result, individuals are not equally suited to all roles and these differences are expected to be major determinants of an individual's occupational choice (Ham et al., 2009). The role of education, experience and individuals' innate ability in their choice of occupation is explained by human capital theory (Becker, 1996). Better education is found to increase the likelihood of an individual having a white-collar job (Bjerk, 2007). In addition, an individual with more years of schooling is more likely to have a professional or clerical job and less likely to become a production or service worker (Tsukahara, 2007). Individuals with better educational attainments tend to be professionals, and technicians, while those with manual work experience tend to be craft and plant workers (Klimova, 2012).

A number of studies have found that an individual's occupational choice is largely determined by his or her family background (Tsukahara, 2007) or the status of his or her parents within a society (Agarwala, 2008; Ham et al., 2009). Using a sample comprised of 851 engineering and architecture students in Spain, Pablo-Lerchundi, Morales-Alonso, and González-Tirados (2015) found that students with self-employed parents are more likely to choose professional jobs. Male children tend to choose the same job as their father in Japan (Tsukahara, 2007), and in India, for both men and women, the choice of a career in management was largely determined by their fathers' careers (Agarwala, 2008). When examining the occupational choice of young people in the UK, Croll (2008) found that children from more occupationally advantaged families were more likely to choose better occupations (professional, managerial, or technical jobs) than those without this advantage.

In numerous studies, other individual and household characteristics, such as age, gender and assets, are also found to significantly affect occupational choice. Klimova's (2012) study in Russia for the period 1994–2001 reveals that gender has a significant influence on job choice, even after controlling for human capital and other characteristics. Specifically, the likelihood of men becoming craft and plant workers is higher than it is for women. By contrast, over the study period women were more likely than men to become professionals, technicians, clerks, and service and sales workers. Using the US data for 1970 and 1990, Soopramanien and Johnes (2001) examined gender effects on occupational choice and found that given the same characteristics, men were more likely than women to engage in manual work. Also, men were more likely than women to choose full-time managerial and professional occupations but less likely to have full-time jobs in services. Evidence from China, Bangladesh and Vietnam shows that older household heads were less likely to participate in nonfarm activities while household heads with less farmland are more likely to take up nonfarm jobs (Tran, 2013).

The pattern and availability of jobs may vary considerably across regions because of geographic location and accompanying differences in labour market opportunities. For example, large urban regions tend to provide greater job opportunities, and some regions may offer better opportunities for either men or women, depending on their specialization (Klimova, 2012). Evidence from many developing countries confirms that residents living in cities or urbanizing areas have greater opportunities to choose nonfarm jobs, both wage-paying and in self-employment (Rigg, 2006; Tran, 2014). In addition, many studies find that firm agglomeration offers more job opportunities for local people (Duranton, 2012; Niu, Ding, & Knaap, 2015).

3. Data and methods

3.1. Data

The current study utilizes the unique data from the School-to-Work Transition Surveys 2015 (SWTS 2015) which were designed to be nationally representative of all young people (individuals aged between 15 and 29 years) in selected households. The SWTS required disaggregation by gender and by general geographic regions (rural/urban) and to the extent possible, aimed to provide reliable calculations of youth labour statistics, including stages of transition.

The sample used for the SWTS 2015 is a sub-sample of the Vietnam Household Living Standard Survey 2015 (VHLSS 2015), which in turn

[1] For greater detail, see http://eng.pcivietnam.org/phuong-phap-c9.html

derives from the master sample frame of the General Statistical Office (GSO), consisting of 15% of total Enumeration Areas[2] (EAs) fixed in the Population and Housing Census 2009. The GSO frame was used as the sampling frame for all GSO conducted national surveys over the next 10 years. Due to the International Labour Organization's (ILO) constrained budget, the SWTS 2015 sample covered only 20 out of 63 provinces in Vietnam, and were chosen using the probability proportional to size (PPS) sampling method for each of six geographic regions.

Our study used a sub-sample of SWTS 2015 and included young people who chose their main occupations as wage-paying or salaried jobs. Self-employed individuals were excluded from our analysis because the data on self-employment income are unavailable in the dataset, possibly due to the difficulty in collecting and accurately calculating this income source in Vietnam.

Data on the quality of labour training provided by provincial authorities were collected from the 2014 Provincial Competitiveness Index (2014 PCI) (Table 1). This is an aggregate performance indicator that measures the efforts of provincial authorities to improve vocational training and skills development for local firms and to give support in placement of local labour (the Vietnam Chamber of Commerce and Industry [VCCI] & the US Agency for International Development [USAID], 2015b). Firm agglomeration index was estimated using the data from the Enterprise Census Data in 2014 and the methods of measuring the firm agglomeration are described in Section 3.2.

3.2. Methods

Once the sample was partitioned into four groups of occupations as shown in Table 2, we used descriptive statistics to provide a detailed picture of young wage earners. We then compared monthly wage incomes, using Bonferroni pairwise tests and first-order stochastic dominant analysis. Following Brown, Stephens, Ouma, Murithi, and Barrett (2006) and Nielsen, Rayamajhi, Uberhuaga, Meilby, and Smith-Hall (2013), we also rank occupational outcomes using first-order stochastic dominant analysis. We determine which occupations have (i) higher outcomes in terms of monthly wage income (the monthly wage income is assumed to reflect the expected outcome of a selected occupation) and (ii) a greater likelihood of earning a higher income relative to other occupations (the sample distributions are assumed to be approximately the underlying distribution for each occupation). That individuals take up occupations with low expected wage income or low probability of earning higher wage income may reflect the fact that they face constraints on their occupational choice.

A multinomial logit model (MLM) was used to investigate factors affecting the likelihood of an individual choosing a given occupation. With its easy estimation and straightforward interpretation (Cheng & Long, 2007), the MLM is the most commonly used model for nominal outcomes. It requires the independence of irrelevant alternatives (IIA), which implies that, all things being equal, a decision maker's choice between two alternatives is not affected by other available options (Hausman & McFadden, 1984).

However, Cheng and Long demonstrated that the tests of the IIA assumption often generate conflicting and inconsistent results. Consequently, these authors suggested that researchers should refer to the best advice on IIA by going back to an early recommendation by McFadden (1974), who confirmed that the MLM should only be applied to cases where the outcomes can be reasonably hypothesized to be dissimilar. As already mentioned, occupational groups are distinct because they were classified into four groups that are mutually exclusive. The above discussion suggests that the choice of the MLM for identifying factors influencing the probability of an individual choosing a given occupation is plausible. There have been numerous studies using the MLM to examine factors affecting occupational choice (e.g., Hinks & Watson, 2001; Klimova, 2012; Tran, Lim, Cameron, & Vu, 2014a; Tsukahara, 2007).

Table 1
11 Composite Sub-Indexes of the Quality of Labour Training Services Provided by Provincial Agencies.

Services provided by provincial agencies: general education (% Very Good or Good)
Services provided by provincial agencies: vocational training (% Very Good or Good)
Firm has used labour exchange services (%)
Firm used private provider for above labour exchange services (%)
Firm intends to use above service provider again for labour exchange services (%)
Percentage of total business costs spent on labour training
Percentage of total business costs spent on labour recruitment
Overall Satisfaction with Labour (% Agreeing labour meets firm needs)
Ratio of vocational training school graduates to untrained labourers
Secondary school graduates as percentage of workforce
Percentage of workers having completed training at vocational schools (new indicator)

Source: VCCI and USAID (2015b).

Let P_{ij} ($j = 1, 2, 3, 4$) denote the probability of an individual choosing a given paid job i with $j = 1$ if the individual works as an unskilled worker, $j = 2$ if the individual works as a skilled manual worker, $j = 3$ if the individual works as a low-skilled non-manual worker, and j = 4 if the individual works as a high-skilled non-manual worker. Then the multinomial logit model is obtained by:

$$P_{ij}(j = k \mid X_i) = \frac{exp(\beta_k X_i)}{\sum_{j=1}^{4} exp(\beta_j X_i)} (j = 1, 2, 3, 4)$$

In order to establish the model identified, β_j is set to zero for one of the categories, and coefficients are then interpreted with respect to that category, called the reference category (Cameron & Trivedi, 2009). Thus, set β_j to zero for one occupational group (say, unskilled workers), then the MLM for each group can be rewritten as:

$$P_{ij}(j = k \mid X_i) = \frac{exp(\beta_k X_i)}{1 + \sum_{j=1}^{4} exp(\beta_j X_i)} (j = 2, 3, 4) \; and \; P_{ij}(j = 1 \mid X_i)$$
$$= \frac{1}{1 + \sum_{j=1}^{4} exp(\beta_j X_{i.})}$$

As discussed in the literature, the likelihood of an individual choosing a given occupation was assumed to be determined by his or her individual and family characteristics. These include age, education, gender, migration, health and marital status, having a child or not, and household size. Family background is determined by the father's occupational status. In the current study, especially, we examine the effect of firm agglomeration on occupational choice because as discussed earlier in the literature review, the former is expected to have a significant effect on the latter. While firm agglomeration can create a greater number of jobs that are accessible to local workers, it also attracts more migrant workers, which in turn might increase job competition.

In our study, we measure the firm agglomeration variable at the level of the district, rather than of the province or commune.[3] There are several reasons for doing this. First, using province-level firm variables can reduce the variation of these variables, due to the small number of provinces (63 provinces). Second, the size of the communes is small and many of them have no firms. People residing in one commune can work in a firm located in another, and there can be a spill-over effect across communes. Thus, using district-level variables can reduce the problem

[2] An Enumeration Area is defined as a smaller geographic area within a particular primary sampling unit.

[3] Vietnam is divided into 63 provinces. Each province comprises districts, and each district is further divided into communes. The number of districts and communes in Vietnam is 684 and 11,112, respectively (GSO, 2009).

Appendix 1
the Estimated Outcome of the Standard Multinomial Logit Model.

Independent variables	Model 1			Model 2		
	Skilled manual jobs	Low-skilled non-manual jobs	High-skilled non-manual jobs	Skilled manual jobs	Low-skilled non-manual jobs	High-skilled non-manual jobs
Age 20–24	1.65	0.84	0.44	0.53	−0.17	−0.73
	(0.563)	(0.428)	(0.452)	(0.358)	(0.519)	(1.035)
Age 25–29	2.46*	1.74	1.08	0.98**	0.38	0.13
	(1.181)	(1.150)	(1.261)	(0.496)	(0.667)	(1.194)
Child	0.53	0.74	0.57	−0.88*	−0.76	−0.80
	(0.237)	(0.519)	(0.399)	(0.475)	(0.728)	(0.741)
Household size	1.24**	1.23	1.34*	0.19*	0.21	0.24
	(0.130)	(0.171)	(0.217)	(0.104)	(0.142)	(0.172)
Gender	0.23***	0.12***	0.08***	−1.59***	−2.24***	−2.73***
	(0.075)	(0.049)	(0.036)	(0.336)	(0.408)	(0.460)
Disability	1.03	0.72	1.27	−0.28	−0.92	−0.27
	(0.857)	(0.653)	(1.096)	(0.878)	(0.925)	(0.915)
Marital status	1.23	0.46	0.62	0.38	−0.31	−0.19
	(0.519)	(0.314)	(0.413)	(0.405)	(0.705)	(0.712)
Migration	3.80**	5.70**	4.12	1.12**	1.67***	1.25*
	(2.111)	(4.099)	(3.609)	(0.495)	(0.635)	(0.744)
Primary/no education	1.81*	2.01	1.31	0.67**	1.06**	0.63
	(0.571)	(0.917)	(1.913)	(0.337)	(0.473)	(1.470)
Lower secondary	3.31***	7.50***	36.29***	1.09**	1.93***	3.54***
	(1.401)	(3.763)	(49.012)	(0.477)	(0.564)	(1.354)
Technical secondary	3.97**	25.13***	2179.33***	1.48**	3.64***	8.01***
	(2.195)	(18.749)	(3201.771)	(0.579)	(0.816)	(1.479)
College/university/above	3.71	56.01***	7108.86***	1.34	4.34***	9.20***
	(3.055)	(48.171)	(11,013.091)	(0.826)	(0.907)	(1.553)
Father unemployed	4.29***	18.18***	24.56***	1.28**	2.47***	2.91***
	(2.279)	(11.588)	(15.394)	(0.581)	(0.750)	(0.754)
Father in non-manual job	0.24**	1.19	0.64	−1.61**	−0.50	−0.90
	(0.170)	(0.845)	(0.447)	(0.670)	(0.667)	(0.655)
Labour training				0.29	0.83**	0.60*
				(0.227)	(0.360)	(0.355)
Firm agglomeration				0.22	0.47*	0.87***
				(0.202)	(0.265)	(0.325)
GDP per capita				1.61***	1.72*	2.42***
				(0.575)	(0.925)	(0.785)
Region (urban–rural)				−0.02	1.50***	1.02**
				(0.317)	(0.394)	(0.458)
Constant	1.03	0.19*	0.01***	−14.41***	−21.51***	−29.10***
	(0.616)	(0.162)	(0.009)	(4.127)	(6.182)	(5.828)
Observations	669			669		
Pseudo R2	0.34			0.39		
Prob > chi2	0.000			0.000		

Note: Estimates are adjusted for sampling weight and clustered at the communal level. Robust standard errors in parentheses. *** p < .01, ** p < .05, * p < .1. Unskilled jobs are the reference group.
Source: Authors' own calculations.

Table 2
Definition of occupational groups.

Occupations	Definition
1. Unskilled workers	Elementary Occupations (ISCO 9)
2. Skilled manual workers	Skilled agricultural and fishery workers (ISCO 6) Craft and related trades workers (ISCO 7) Plant and machine operators and assemblers (ISCO 8)
3. Low skilled non-manual workers	Clerks (ISCO 4) Service workers and shop and market sales workers (ISCO 5)
4. High skilled non-manual workers	Legislators, senior officials and managers (ISCO 1) Professionals (ISCO 2) Technicians and associate professionals (ISCO 3)

The type of occupation is defined according to the International Standard Classification of Occupations, ISCO−88, 1-digit level (ILO, 2012).

of firm spill-over effects (Giang, Nguyen, & Tran, 2016).

According to Lall, Shalizi, and Deichmann (2004), there are three methods of measuring firm agglomeration (or localization economies). These include own-industry employment in the region, own-industry establishment, and an index of concentration which reflects a disproportionately high concentration of the industry compared to the nation. While Ciccone and Hall (1996) argue that own-industry enterprises calculation (density of firms in one industry) is more accurate in identifying determinants of productivity than own-industry employment (the size), in the current study we prefer to apply the third approach (index of concentration) because we focus on the agglomeration effect on young people's choice of occupation instead of on firm productivity. Exploring the Enterprise Census data in 2014, we calculate the agglomeration index as follows:

$$LQ_{ij} = s_{ij}/s_j = (L_{ij}/L_{i.})/(L_{.j}/L_{..})$$

where: L_{ij} – Number of workers of industry *i* in district *j*$L_{i.}$ – Number of workers of industry *i* in the country$L_{.j}$ – Number of workers in district *j*$L_{.}$ – Number of workers in the country

Thus s_{ij} is the employment share of industry *i* in district *j* relative to the total amount of employment in the industry in the whole country,

Table 3
Definition and measurement of included variables.

Variables	Definition	Measurement
Individual characteristics		
Group 1: 15–19 years	1 if in 15–19-year age group, otherwise 0	Dummy
Group 2: 20–24 years	1 if in 20–24-year age group, otherwise 0	Dummy
Group 3: 25–30 years	1 if in 29–30-year age group, otherwise 0	
Child	1 if with at least one child, 0 otherwise	Dummy
Household size	Total number of family members	Number
Gender	1 if male, 0 otherwise	Dummy
Disability	1 if with disability, 0 otherwise	Dummy
Marital status	1 if married, 0 otherwise	Dummy
Migration	1 if a migrant, 0 otherwise	Dummy
No education/primary	1 if without education or having completed lower secondary education, 0 otherwise	Dummy
Lower secondary	1 if completed lower secondary education, 0 otherwise	Dummy
Upper secondary	1 if completed upper secondary education, 0 otherwise	Dummy
Technical secondary	1 if completed technical secondary education, 0 otherwise	Dummy
College/university/above	1 if completed college/university/above, 0 otherwise	
Father unemployed	1 if the respondent's father was unemployed or inactive, 0 otherwise	Dummy
Father in manual job	1 if manual work is the main job of the respondent's father, 0 otherwise	Dummy
Father in non-manual job	1 if non-manual work is the main job of the respondent's father, 0 otherwise	Dummy
Contextual variables		
Labour training	The quality of labour training services provided by the provincial government	Score (1–10)
Firm agglomeration	A concentration index which reflects a disproportionately high concentration of the industry compared to the nation	Logarithm
GDP per capita	Logarithm of gross domestic product (GDP) per capita at provincial level	Logarithm
Region (urban-rural)	1 if living in urban areas, 0 if living in rural areas	Dummy

Note: The data on Gross Domestic Product (GDP) per capita for 20 provinces in 2014 were taken from GSO (2015).

and $s_{.j}$ is the share of employment in district *j* relative to the total number employed and working in the overall economy. Thus, if LQ_{ij} is larger than 1, then industry *i* is considered to be more concentrated in district *j* than in the nation (Lall et al., 2004).

More importantly, in the current study our main interest is to investigate the effect of labour training on occupational choice. In Vietnam, provincial governments have autonomy to implement or apply policies and regulations even though the central government may have distinct laws and regulations for all regions and provinces (Malesky, 2008). As a result, while some provinces have made significant advances in improving the quality of labour training, others have lagged behind (VCCI & USAID, 2015a). Controlling for all other factors in the models, it is hypothesized in our study that young people living in provinces with better quality labour training were more likely to choose better jobs. There have been substantial disparities in social and economic development across Vietnamese provinces and regions (Tran, Vu, Doan, & Tran, 2016), which in turn may lead to differences in employment patterns and in opportunities in the provinces. Thus, the provincial GDP per capita and regional variables are included in the models to capture the availability and patterns of jobs that may vary across provinces and regions. Table 3 describes the definition and measurements of variables included in the model of occupational choice.

4. Results and discussion

4.1. Descriptive statistics

The sample of SWTS 2015 includes 1549 youth who completed an individual questionnaire. Fig. 1 shows that about 86% of youth employed and 14% were unemployed or inactive.[4] The percentage of males being employed is higher than that of females (90% vs 83%). As given in Fig. 2, the majority of young employed workers were engaged in wage and salaried employment and the percentage of male workers in this occupation group was about 2.3 percentage points higher than that of female workers (64.4% and 62.14%, respectively). On the other hand, the share of youth remained in unpaid family work and self-employment accounts for about 17.3% and 14.4%, respectively. Also, the data indicate that the proportion of youth remaining in these two occupation groups is similar between males and females.

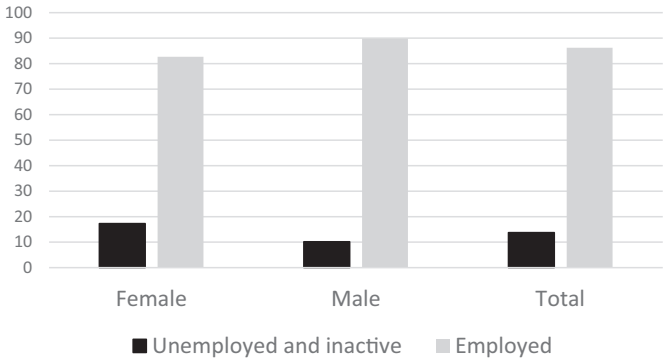

Fig. 1. Youth population by Employment Status (%)
Source: Authors' own calculations.

Fig. 2. Occupation of youth by gender (%)
Source: Authors' own calculations.

Table 4 reports summary statistics of the sample of wage workers. The sample is clustered into three age groups: 15–19, 20–24, 25–29. The distributions are similar for the two older groups while the

[4] Those without work, available for work but not actively seeking a job and inactive students who reported an intention to work at a later stage).

Table 4
Descriptive statistics of young wage workers by gender.

Individual/family characteristics	Female		Male		All	
	Mean	SD	Mean	SD	Mean	SD
Age 20–24	0.42	0.49	0.41	0.49	0.42	0.49
Age 25–29	0.41	0.49	0.38	0.48	0.39	0.49
Child	0.51	0.50	0.28	0.45	0.40	0.49
Household size	4.77	1.70	4.60	1.67	4.69	1.69
Gender					0.50	0.50
Disability	0.08	0.27	0.07	0.26	0.08	0.27
Marital status	0.60	0.49	0.36	0.48	0.48	0.50
Migration	0.15	0.36	0.06	0.24	0.10	0.31
Lower secondary	0.26	0.44	0.32	0.47	0.29	0.45
Upper secondary	0.20	0.40	0.16	0.36	0.18	0.38
Technical secondary	0.09	0.29	0.11	0.32	0.10	0.30
College/university/above	0.23	0.42	0.15	0.36	0.19	0.39
Father unemployed	0.06	0.01	0.09	0.01	0.08	0.01
Father in manual job	0.75	0.43	0.73	0.44	0.74	0.44
Father in non-manual job	0.19	0.39	0.18	0.38	0.18	0.39
Occupational choice						
Unskilled workers	0.08	0.27	0.24	0.43	0.17	0.37
Skilled manual workers	0.43	0.50	0.48	0.50	0.46	0.50
Low-skilled non-manual workers	0.18	0.39	0.12	0.33	0.15	0.36
High-skilled non-manual workers	0.30	0.46	0.15	0.36	0.22	0.42
Contextual variables						
Labour training	6.20	0.81	6.25	0.80	6.22	0.80
Firm agglomeration	11.12	53.08	9.45	38.25	10.29	46.27
GDP per capita (1000 VND)	2774.18	1145.22	2742.72	1114.33	2758.48	1129.63
Region (urban–rural)	0.48	0.50	0.42	0.49	0.45	0.50
Observations	362		411		773	

Source: Authors' own calculations.

youngest group (15–19) accounts for a much smaller proportion at only 19%. This trend is also found to be similar for males and females. About 40% of the young people had least one child and the figure is much higher for women than men (51% vs 28%). Seven percent of males and 8% of females reported having at least one disability. The proportion of those already married is 48% for the whole sample but the figure is higher for women (60%) than for men (48%). Ten percent of the young people were migrant workers and the migration rate seems to be higher among females than males (15% vs 6%).

Regarding the educational status of young wage workers, the estimates in Table 4 show that 24% of young wage workers had not completed lower secondary education. The corresponding figures are somewhat higher for men (26%) than for women (22%). 19% of the young people had a college or university degree or above and the corresponding proportion is higher among females (23%) than among males (15%). However, the share of those with technical secondary level education remained at 10% among the whole sample and the figures do not differ substantially between females and males. With respect to the occupational status of the fathers of these young people, the data indicate that 74% were engaged in manual work, whereas only 18% had non-manual jobs.

An analysis of the occupational choice of youth by gender shows several interesting results. As can be seen in Table 4, skilled manual jobs are the most popular occupational group, accounting for 46% of the sample. This is followed by high-skilled non-manual workers (22%), unskilled workers (17%), and finally low-skilled non-manual workers (15%). However, the choice of occupation differs between women and men. While the choice of skilled manual work is the most popular occupation for both groups, the choice of unskilled jobs seems to be much lower among women than among their male counterparts (8% vs 24%) (Table 4).

In addition, the proportion of females choosing non-manual jobs, including both low-skilled and skilled jobs, tends to be greater than for males. The findings suggest that there is a significant difference in occupational choice between men and women. These findings seem to be inconsistent with Institute for Social Development Studies (2016), which shows a higher proportion of men than women working in the areas of management or other qualified jobs in both rural and urban areas. The difference may stem from the fact that while our study drew its sample from young wage workers, the Institute for Social Development Studies (2016) used samples from all age groups and all types of employment (both wage-paying and self-employment). In addition, different findings may result from using different datasets, different location coverage, and different survey times.

Summary statistics of youth, by region and migration status, are given in Table 5. Nearly half the young people in urban areas belong to the oldest age group (25–29), whereas the corresponding figures for those in rural areas are about one third. The proportion of youth in rural areas is 57%, which is higher than that in urban areas (47%). The number of young people who are migrants is much lower for men (34%) than for women (66%). The average household size is smaller among migrant youth (3.40) than among non-migrant youth (4.70). The percentage of married young people is greater in rural areas and also higher for migrant workers. Unsurprisingly, urban youth have better educational attainments, with 38% having college or university degrees or above, more than twice the level for rural youth (17%). Also, non-migrant youth have higher educational levels than their migrant counterparts.

Regarding the parental occupation of youth, the data show that the fathers of 28% of urban youth were in non-manual occupations, while the corresponding figures are only 10% for rural youth. By contrast, 86% of rural youth had fathers in manual jobs, a higher level than for urban youth (60%). There is an evident difference in occupational choice between rural and urban youth. Fifty-five percent of urban youth were engaged in non-manual jobs (both low-skilled and skilled jobs), whereas such occupations were chosen by only 20% of rural youth.

Table 5
Descriptive statistics for young wage earners by region and migration status.

Individual/family characteristics	Rural		Urban		Non-migrant		Migrant	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age 20–24	0.45	0.50	0.37	0.48	0.41	0.49	0.41	0.49
Age 25–29	0.34	0.47	0.48	0.50	0.40	0.49	0.44	0.50
Child	0.37	0.48	0.31	0.46	0.34	0.47	0.37	0.48
Household size	4.70	1.62	4.32	1.77	4.68	1.64	3.40	1.72
Gender	0.57	0.50	0.47	0.50	0.55	0.50	0.34	0.48
Disability	0.04	0.20	0.10	0.30	0.07	0.25	0.08	0.28
Marital status	0.45	0.50	0.37	0.48	0.41	0.49	0.47	0.50
Migration	0.11	0.31	0.15	0.35				
Lower secondary	0.34	0.48	0.17	0.38	0.25	0.43	0.32	0.47
Upper secondary	0.15	0.36	0.15	0.36	0.15	0.35	0.18	0.39
Technical secondary	0.11	0.32	0.11	0.31	0.12	0.32	0.07	0.26
College/university/above	0.17	0.37	0.38	0.49	0.29	0.45	0.14	0.35
Father unemployed	0.04	0.01	0.12	0.02	0.08	0.01	0.04	0.02
Father in manual job	0.86	0.35	0.60	0.49	0.73	0.45	0.80	0.41
Father in non-manual job	0.10	0.30	0.28	0.45	0.19	0.39	0.16	0.37
Occupational choice								
Unskilled workers	0.21	0.41	0.12	0.32	0.18	0.38	0.09	0.29
Skilled manual workers	0.57	0.50	0.34	0.47	0.44	0.50	0.61	0.49
Low-skilled non-manual workers	0.08	0.27	0.23	0.42	0.15	0.35	0.18	0.39
High-skilled non-manual workers	0.13	0.34	0.32	0.47	0.24	0.43	0.11	0.32
Contextual variables								
Labour training	6.18	0.83	6.47	0.75	6.34	0.81	6.20	0.77
Firm agglomeration	7.79	9.38	3.67	3.61	5.96	7.40	4.63	7.84
GDP per capita	2745.94	1005.89	3203.37	1192.23	2960.31	1130.43	3021.66	1076.09
Region (urban-rural)					0.47	0.50	0.56	0.50
Observations	396		374		98		672	

Source: Authors' own calculations.

Skilled manual jobs appear to comprise the most popular occupations in both rural and urban areas, but are more common in rural (57%) than in urban areas (34%). The proportion of youth in unskilled jobs is 21% for rural youth, which is nearly double the number for urban youth (10%). The sample data reveal that while GDP income per capita is higher in urban areas than in rural areas, the firm agglomeration tended to be higher in rural areas and in urban areas.

The findings suggest that job patterns and opportunities may vary considerably across urban and rural regions. Skilled manual jobs tend to be the most popular occupations for both migrant and non-migrant youth. This choice is more common among migrants (61%), however, than among non-migrants (44%). The second most popular choice of occupation for non-migrants is high-skilled non-manual jobs (24%), whereas the figure for migrants choosing such jobs is 18%. The percentage of migrant youth choosing unskilled jobs is lower than that of their non-migrant counterparts (18% vs 9%).

4.2. Comparing occupational outcomes

Table 4 shows mean wage income per month by occupation. In order to rank the outcomes of each occupation in terms of monthly wage income and job satisfaction, Bonferroni pairwise tests were conducted across the four occupations. Unsurprisingly, high-skilled non-manual jobs offer the highest income and unskilled workers receive the lowest income, whereas both skilled manual jobs and low-skilled manual jobs have similar income levels. Specifically, the highest-paid occupation group received a monthly wage about 1,53 million VND higher than the lowest-paid occupation group and about 850,000 VND higher than the medium-paid occupation group. The income gap between the medium-wage and the lowest-wage jobs remains at about 690,000 VND. The Bonferroni pairwise tests in Table 6 also confirm that the unskilled occupation group had a lower level of job satisfaction than other occupation groups, while high-skilled non-manual workers reported being more satisfied with their jobs than those with low-skilled non-manual jobs.

Following Brown et al. (2006) and Nielsen et al. (2013), we also rank occupational outcomes using first-order stochastic dominant analysis. According to Whitmore and Findlay (1978), an occupation that is characterized by first-order stochastic domination over another occupation is one that has a lower cumulative density relative to other occupations for all possible wage income levels, reflecting a higher probability of earning higher wages. Fig. 3 shows that many observations of high-skilled non-manual jobs and skilled manual jobs overlap. This is also the case for skilled manual jobs and low-skilled non-manual jobs. Therefore, while it is quite unclear which is better paid, whether skilled manual or high-skilled non-manual jobs, Fig. 1 indicates that high-skilled non-manual jobs stochastically dominate both unskilled and low-skilled non-manual jobs, suggesting that high-skilled non-manual jobs have a greater likelihood of earning higher incomes compared to unskilled jobs and low-skilled non-manual jobs. Overall, Fig. 3 confirms that unskilled jobs make up the least lucrative occupation group. The cumulative density distributions confirm the Bonferroni test results and, combined, show that some occupations are superior to others, assuming that young workers try to maximize their wage earnings.

4.3. Determinants of occupational choice

Table 7 presents the results from the MNL regressions. We ran two models using different sets of explanatory variables. When contextual variables were added in Model 2, the Pseudo R-squares significantly increased from 0.34 to 0.39 and all newly added variables were statistically significant, while the statistical significance of other variables all mostly remained constant. Thus, Model 2 (the full model) appears to provide the best result. The estimation results indicate that many explanatory variables are statistically significant at the 10% level or lower, with their signs as expected. In addition, the Pseudo-R^2 = 0.39 and is highly significant, suggesting that this model has strong explanatory power (Louviere, Hensher, & Swait, 2000; Scarpa et al., 2003).

Table 6
Pairwise comparison of wage income and job satisfaction across occupational groups using the Bonferroni method.

Monthly wage incomes	All workers	Unskilled workers	Skilled manual workers	Low-skilled non-manual workers	High-skilled non-manual workers
Group		**1**	**2**	**3**	**4**
Observations	755	121	346	117	171
Mean	4125	3352	4046	4038	4891
SD	1913	1181	1532	2022	2581
			2	**2**	**4**
Comparing income across groups		**3**	−8		
			(1.00)		
		4	845	853	
			(0.00)	(0.00)	
		1	693	685	1538
			(0.00)	(0.040)	(0.00)

Job satisfaction scores	All workers	Unskilled workers	Skilled manual workers	Low-skilled non-manual workers	High-skilled non-manual workers
Group		**1**	**2**	**3**	**4**
Observations	755	121	346	117	171
Mean	2.95	2.72	3.00	2.90	3.10
SD	0.53	0.60	0.46	0.60	0.52
Comparing job satisfaction across groups			**2**	**3**	**4**
		3	−0.11		
			(0.28)		
		4	0.08	0.19	
			(0.65)	(0.01)	
		1	0.27	0.16	0.35
			(0.00)	(0.09)	(0.00)

Note: Results reported are mean differences in monthly wage income and job satisfaction scores and *P*-values are in parentheses. Wage income. Unit: 1000 VND and 1 USD equated to about 22,000 VND in 2015. SD: standard deviation.
Source: Authors' own calculations.

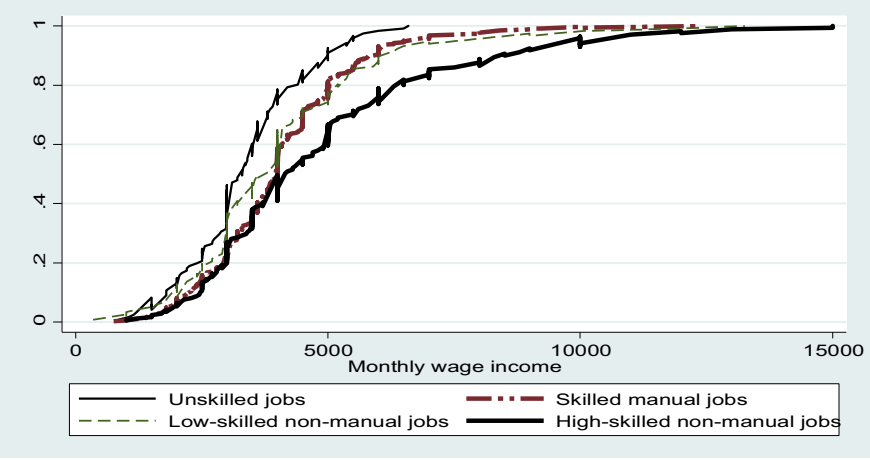

Fig. 3. Differences in wage income across occupational groups. Source: Authors' own calculations.

Note that the relative risk ratios (RRRs) show the effect of predictors of the likelihood of an individual choosing a given occupation compared to that of choosing the reference occupation group (unskilled jobs). All things being equal,[5] the age evidence suggests that the probability of choosing skilled manual jobs is 166% higher for the oldest age group than for the youngest group. Possibly, older workers might have more time or more experience for having skilled manual jobs or such jobs might be more suitable for older workers and younger ones. However, the age effect is not found for other occupation choices.

While individuals who had at least one child would be 58% less likely to choose a skilled manual job than those without children, having an additional household member increases this probability by 21%. Nevertheless, other occupational choices seem not to be affected by household size and having a child. Marital status has no association with choice of occupation, but migration status is strongly linked with job choice. Migration variable coefficients are positive and highly significant, suggesting that migrant workers were more likely than their non-migrant counterparts to have better jobs. The results show that all things being equal, the probability of a migrant worker obtaining a skilled manual job would be 207% higher than that of a non-migrant worker. Similarly, migrant workers would have a 409% higher probability of choosing low-skilled non-manual jobs and a 248% higher probability of choosing high-skilled non-manual jobs compared to non-migrant workers.

[5] Relative risk ratios (RRRs) are exponentiated coefficients = exp. (β), where β is the estimated outcome of the standard multinomial logit model (see more in Appendix 1). For an individual from the oldest group, the relative likelihood of choosing a skilled manual occupation rather than an unskilled occupation = exp. (0.97879 × 1) = 2.661233 ≈ 2.66. The probability of choosing a skilled manual job for the oldest group = 2.66–1 = 1.66 = 166% higher than for the youngest group.

Table 7
Factors associated with occupational choice.

Independent variables	Model 1			Model 2		
	Skilled manual jobs	Low-skilled non-manual jobs	High-skilled non-manual jobs	Skilled manual jobs	Low-skilled non-manual jobs	High-skilled non-manual jobs
Age 20–24	1.65	0.84	0.44	1.70	0.84	0.48
	(0.563)	(0.428)	(0.452)	(0.606)	(0.438)	(0.500)
Age 25–29	2.46*	1.74	1.08	2.66**	1.46	1.14
	(1.181)	(1.150)	(1.261)	(1.320)	(0.974)	(1.365)
Child	0.53	0.74	0.57	0.42*	0.47	0.45
	(0.237)	(0.519)	(0.399)	(0.197)	(0.340)	(0.334)
Household size	1.24**	1.23	1.34*	1.21*	1.23	1.27
	(0.130)	(0.171)	(0.217)	(0.125)	(0.175)	(0.219)
Gender	0.23***	0.12***	0.08***	0.20***	0.11***	0.07***
	(0.075)	(0.049)	(0.036)	(0.068)	(0.043)	(0.030)
Disability	1.03	0.72	1.27	0.76	0.40	0.77
	(0.857)	(0.653)	(1.096)	(0.665)	(0.369)	(0.700)
Marital status	1.23	0.46	0.62	1.46	0.74	0.83
	(0.519)	(0.314)	(0.413)	(0.593)	(0.519)	(0.590)
Migration	3.80**	5.70**	4.12	3.07**	5.29***	3.48*
	(2.111)	(4.099)	(3.609)	(1.521)	(3.360)	(2.588)
Primary/no education	0.30***	0.13***	0.03***	0.34**	0.14***	0.03***
	(0.128)	(0.067)	(0.037)	(0.161)	(0.082)	(0.039)
Lower secondary	0.55	0.27***	0.04**	0.66	0.42*	0.05**
	(0.210)	(0.128)	(0.047)	(0.277)	(0.205)	(0.070)
Technical secondary	1.20	3.35*	60.05***	1.48	5.51**	87.53***
	(0.676)	(2.222)	(52.347)	(0.914)	(3.927)	(77.390)
College/university/above	1.12	7.47**	195.88***	1.29	11.11***	288.75***
	(0.938)	(6.018)	(194.324)	(1.075)	(9.224)	(289.517)
Father unemployed	0.24**	1.20	0.64	0.20**	0.61	0.40
	(0.170)	(0.845)	(0.447)	(0.133)	(0.405)	(0.265)
Father in non-manual job	4.30***	18.20***	22.56***	3.60**	11.90***	18.33***
	(2.278)	(11.588)	(15.394)	(2.093)	(8.904)	(13.819)
Labour training				1.34	2.29**	1.82*
				(0.304)	(0.827)	(0.645)
Firm agglomeration				1.25	1.60*	2.40***
				(0.253)	(0.423)	(0.779)
GDP per capita				4.99***	5.59*	11.28***
				(2.865)	(5.172)	(8.853)
Region (urban-rural)				0.98	4.47***	2.78**
				(0.310)	(1.762)	(1.271)
Constant	0.25*	0.23	0.00***	0.00***	0.00***	0.00***
	(0.205)	(0.246)	(0.007)	(0.000)	(0.000)	(0.000)
Pseudo R^2	0.34				0.39	
Prob > chi^2		0.000			0.000	
Observations		669			669	

Note: Estimates are RRR (Relative Risk Ratio). Estimates are adjusted for sampling weight and clustered at the communal level. Robust standard errors in parentheses. Unskilled jobs are the reference group. The omitted categories in the dummy variable analyses are: female sex; with disability; married; migrant; upper secondary school; father in manual job and rural areas.
Source: Authors' own calculations.
*** p < .01.
** p < .05.
* p < .1.

Gender has a significant effect on occupational choice. Surprisingly, females were more likely than males to choose better jobs. Specifically, the gender evidence confirms that all things being equal, females on average had an 80% higher probability of choosing skilled manual jobs, an 89% higher probability of choosing low-skilled non-manual jobs, and a 93% higher probability of choosing high-skilled non-manual jobs compared to males. Possibly, this phenomenon might be explained by the fact that young female workers outperform their male counterparts at using soft skills in recruitment. A number of studies confirm that female employers were more likely than their male counterparts to exhibit soft skills (Ferry, 2016; Spade & Valentine, 2011). Our research finding is partly consistent with that of Klimova in Russia (2012), who found that females were more likely than males to work as technicians/professionals and clerks/services/sales workers and less likely to work as manual or plant workers. Similarly, it was found in Japan that females have a greater likelihood of choosing professional, clerical, and service occupations, and are less likely to choose a production occupation (Tsukahara, 2007).

With respect to the role of education, the results indicate that education has the greatest effect on the choice of some occupational groups. In general, better education increases the likelihood of an individual choosing a better job. For instance, all things being equal, individuals with a primary degree or no education would have a 66% lower probability of becoming skilled manual workers, an 86% lower probability of becoming low-skilled non-manual workers, and a 97% lower probability of becoming high-skilled non-manual workers, compared to those with an upper secondary education degree.

The influence of education is much greater for higher education levels. A technical secondary degree or a college or university degree (or higher) increases the probability of choosing low-skilled non-manual jobs by 8653% and that of choosing high-skilled non-manual jobs by 2,8775%. The strong, positive effect of education on occupational choice is also found in Japan (Tsukahara, 2007), Russia (Klimova, 2012), and the US (Bjerk, 2007). However, it should be noted

that while educational attainment is the most important factor in the choice of both low-skilled non-manual jobs and high-skilled non-manual jobs, this is not the case for choosing skilled manual jobs. The explanation may be that skilled manual jobs do not require higher levels of education (e.g., technical secondary or college/university degrees).

The results reveal that fathers' employment status strongly influences the children's occupational choice. For example, all things being equal, the children of fathers engaged in non-manual jobs have a 260% higher probability of choosing skilled manual jobs, compared to those whose fathers have manual jobs. Similar but much stronger effects are also found for the choice of low-skilled non-manual jobs and high-skilled non-manual jobs, with corresponding probabilities of 1090% and 1733%. Numerous studies have examined the effect of parental employment status and have confirmed that it is a valid determinant of children's occupational choice in both developed (Pablo-Lerchundi et al., 2015; Tsukahara, 2007) and developing countries (Agarwala, 2008; Giulietti, Tatsiramos, & Zimmermann, 2013). This finding might be explained by the fact that if a father achieves high occupational status, his social position can assist his children in achieving better occupations. This trend of intergenerational occupational transfer is often referred to as “dynasty hysteresis” (Bradley, 1991).

Regarding the role of contextual factors in occupational choice, the results confirm that the quality of labour training has a positive effect on the choice of better jobs. Specifically, all things being equal, if the score of labour training increases by one point, the probability of an individual choosing a low-skilled non-manual job or a high-skilled non-manual job increases by 129% and 82%, respectively. The finding suggests that overall, labour training services provided by provincial governments are useful and can help young people gain access to better jobs. In addition, the study finds that firm agglomeration increases the chance of choosing both low-skilled non-manual and high-skilled non-manual occupations. This implies that firm agglomeration provides better job opportunities for local workers. The same finding is also observed in previous studies (Duranton, 2012; Niu et al., 2015).

We also find that the level of economic development (measured by the provincial gross domestic product per capita) increases the likelihood of local workers choosing skilled manual jobs, low-skilled non-manual jobs, and high-skilled non-manual jobs. For example, all things being equal, a 10% increase in provincial GDP per capita would increase the likelihood of an individual choosing a skilled manual job, a low-skilled non-manual job, or a high-skilled non-manual job by 17%, 19% and 26%, respectively.[6]

Finally, the study finds regional differences in job opportunities. Specifically, the results indicate that on average, individuals in urban areas have a 347% higher probability of choosing low-skilled non-manual jobs than individuals in rural areas with the same individual, family, and other characteristics. The likelihood of securing high-skilled non-manual jobs is also 178% higher in urban areas than in rural areas.

5. Conclusion and policy implications

While numerous studies have examined factors affecting occupational choice in both developing and developed countries, little is known about this issue in Vietnam. Going beyond existing studies, we conducted a micro-econometric analysis of factors affecting occupational choice among Vietnamese youth, using updated data sets from the SWTS 2015, PCI 2014 and the Enterprise Census data in 2014. The current study finds that while individual and family characteristics in particular play a decisive role in explaining young people's choice of occupation, other contextual factors also have a significant influence on occupational choice. We also rank occupational outcomes in terms of monthly mean wage income and find that high-skilled non-manual jobs appears to offer the highest income, whereas unskilled jobs comprise the least lucrative occupation group. Skilled manual jobs and low-skilled non-manual jobs can be classified as the medium-income occupation group.

Our results confirm that gender is an important factor affecting occupational distribution of men and women, even after controlling for differences in individual and family attributes and contextual factors. Specifically, we find that women were more likely than men to obtain better jobs. As already discussed, this may be explained with the suggestion that women are better than men at using soft skills in recruitment. The difference may also result from the fact that some better paying jobs are more suited to women than they are to men. Similar gender effects are reported in other studies (Klimova, 2012; Tsukahara, 2007).

We find that higher levels of education (e.g., technical secondary or a college/university degree) were the most important factor for securing non-manual jobs (both low- and high-skilled jobs), even after controlling for all other factors in the models. While unemployment may be high and declining returns for education not uncommon even among better educated workers (Doan et al., 2017), our research findings clearly suggest that investing in education brings better occupational outcomes in terms of wages and access to better jobs. A policy implication here is that the state's investment in education for poor youth can provide them with greater opportunities for better jobs and improve their welfare.

Interestingly, our study confirms that family background, as measured by a father's occupational status, has a significant influence on the children's choice of occupation. As noted by Tsukahara (2007), if an individual's current occupation can be largely determined by his or her parents' socio-economic position, it is apparent that not all have the same opportunities. Thus, our research findings support the view that access to more lucrative occupations can be transmitted across generations in Vietnam. In addition, the difference in job opportunities by region clearly indicates that rural youth have fewer opportunities for better jobs than urban youth. However, providing equal opportunity for every young person would be a preferable situation in a transitional Vietnam. This offers an interesting topic for future research.

Fortunately, our econometric analysis finds that labour training services provided by provincial authorities improve the access of young workers to better jobs. This is a positive signal, as local governments can play an important role in enhancing linkages between the education and training system and industry. As indicated in Table 1, by improving several sub-indicators related to their labour training services, provincial governments can mitigate the mismatch and increase the links between education and training institutions and local firms. In addition, the positive effects of firm agglomeration and economic development suggest that by improving the quality of provincial institutions, local governments can attract more investment, boost business and promote economic growth, which in turn offer more job opportunities for local people.

We acknowledge that our study has some limitations. First, we are unable to examine factors affecting job changes over time due to lack of longitudinal data. The use of panel data in estimating an occupational choice equation reduces the bias because it controls for time invariant unobservable individual characteristics. This suggests that further research is needed to address this issue. Second, while our study identified which occupations offer the highest and lowest wage incomes, we did not compare incomes across all types of employment (for instance: self-employment vs wage employment). This is because the data available did not contain information on incomes from self-employment. This is another interesting topic should be investigated in future

[6] Given a 10% increase in provincial GDP per capita, the corresponding difference in logarithm for the provincial GDP per capita is log (1.01) = 0.09531, and the relative likelihood of choosing the skilled manual occupation group rather than the unskilled occupation group can be expressed in terms of the exponential function as: exp.(1.6068348*0.09531) = 1.165497 ≈ 1.17. The corresponding relative likelihood of choosing low-skilled non-manual jobs and high-skilled non-manual jobs (rather than the unskilled occupation group) is 1.19 and 1.26, respectively.

research. Finally, there are some caveats in interpreting the results of our study. Interpretations about the causality should be made with some caution, and we tend to refer to empirical justifications of associations between variables included in the regression models. Also, we understand that a rather large number of independent variables as stated in our models under consideration will possibly give rise to some degree of dependency, and hence the hierarchical nature, which goes beyond the scope of this study. In addition, it is less straightforward to perform meticulous calculations of empirical probabilities although they can help enhance our in-depth understanding of the conditional dependency and probabilities among groups of variables, given certain control variates as demonstrated in (Vuong, 2017).

Conflict of interest

Declare that there is no conflict of interest in this study.

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