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Are migrants in large cities underpaid? Evidence from Vietnam

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Abstract

This paper examines the wage gap between migrants and non-migrants in large cities in Vietnam. It finds that migrants receive substantially lower wages than non-migrants. The wage gap tends to be larger for older migrants. However, once observed demographic characteristics of workers are controlled, there are no differences in wages between migrants and non-migrants. The main difference in observed wages between migrants and non-migrants is explained by differences in age and education between migrants and non-migrants.

JEL Classification: O15, R23, I32

Keywords: Migration, Underpaid wages, Decomposition, Household survey, Vietnam

1 Introduction

The most importance reason for migration is financial motivation and better employment (Hicks 1932; Chiswick 1978; Borjas 2012). Harris and Todaro (1970) argue that in developing countries, laborers from rural areas will move into cities as they expect to earn higher wages in the urban areas without worrying about the increasing level of unemployment in this area. According to the New Economics Theory of Migration, migration is viewed as a collective decision of not only individuals but also their families, and the main incentive for migration is high income in destination areas (Stark and Bloom 1985; Stark and Taylor 1991; Stark 1991).

Migration has been viewed as an important source of poverty reduction in developing countries (Taylor et al. 2005; Adams and Pages 2005; Acosta et al. 2007). Migration also has other positive impacts on education, health, and production of migrants as well as their families in home areas (Mountford 1997; Stark et al. 1997; Beine et al. 2001; Kochar 2004; McKenzie 2006). However, there might be negative effects of migration on the remaining people in home areas such as marital breakdown, decreasing education, and health care for children (e.g., Katseli et al. 2006; McKenzie 2006; Antman 2010; Silver 2014).

A major concern for migrants is whether they are underpaid in destination areas (Özden and Maurice 2006). There are serveral explanations for a wage gap between migrant workers and native ones. Firstly, migrants tend to move from rural or less advantageous areas to urban or more advantageous ones. Migrant workers tend to have lower education, working skills, and experiences than native workers in

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destination areas (Lall et al. 2006; Maurer-Fazio et al. 2015). As a result, they receive lower wages than the native workers. Secondly, as moving to a new area, migrants tend to lack language skills, network, and information on employment opportunities (Chiswick 1978; Borjas 2012). They are more likely to do jobs that they are overqualified (Liu et al. 2004; Özden 2006; Lall et al. 2006). Thirdly, assymetric information on labor productivity between employees and employers at the destination areas also leads to a lower wage rate for migrant employees. Employers have less information about migrants' productivity and skills and tend to offer low-wage jobs for migrants (Chiswick 1978). Fourthly, there might be a discrimination against migrants in labor market. For example, in China, empirical studies share a conclusion that discrimination is the major determinant of the earnings gap between migrants and urban workers in urban China (e.g., Lee 2012 and Wang et al. 2013; Cheng et al. 2013; Gagnon et al. 2014).

Borjas (2012) shows that earnings of migrants are initially lower than the natives, but the gap in earnings will decrease over time as the migrants accumulate human capitals and have better access to information on labor markets. Migrants will find better match with the destination employers (Liu et al. 2004). Destination employers will also have better information on migrants' ability and provide more firm-specific training for their migrant employees. Due to improvements in working skills, knowledge, and access to information on labor markets, migrant workers will have higher earnings. Furthermore, earnings of migrants can even surpass the native workers' if they are positively selected from the migrant population (Borjas 2012).

There are a large number of empirical evidences showing a gap in earnings between migrants and natives, particularly in China. Overall, empirical studies find that migrants from rural areas normally get fewer chances to get a job in the formal sector in the urban areas, and as the consequence, their earnings are lower than native workers in urban areas (Camarota 1998; Meng 2000; Meng and Zhang 2001; Özden 2006; Demurger et al. 2009; Cheng et al. 2013; Liu and Kawata 2015). Camarota (1998) finds that unskilled migrant workers are underpaid in the USA. Also, using the US data, Özden (2006) finds that with the same skills, migrants earn less than the natives. Demurger et al. (2009) show that the annual earnings of urban residents are 1.3 times larger than that of long-term migrants from rural areas in China. Meng and Zhang (2001) show that within an occupation, migrant peasants are underpaid while native workers are overpaid in Shanghai city.

In this study, we examine the wage gap between migrant workers and native workers in Hanoi capital city and Ho Chi Minh City (HCMC)—the two largest cities in Vietnam. Internal migration has been an important aspect of Vietnamese society (Marx and Fleischer 2010). According to the 2009 Population and Census of Vietnam, there were 6.6 million people migrating within the country over the 2004–2009 period. This is a significant increase compared with the 1999 Census data with 4.5 million people migrating internally in Vietnam. Most internal migration in Vietnam is rural-to-urban migration, especially migration to Hanoi and HCMC.

There are several studies looking at the effect of migration and remittances on migrants' origin households in Vietnam. Migration is found to have a positive effect on households' consumption and poverty reduction in studies such as De Brauw and Harigaya (2007), Nguyen et al. (2008), and Nguyen et al. (2011). Using Vietnam

Household Living Standard Surveys (VHLSS) 2002 and 2004, Nguyen (2008) finds that international remittances help receiving households increase consumption and reduce poverty. However, using the 2006 and 2008 VHLSSs, Nguyen and Mont (2012) and Nguyen et al. (2013) do not find a poverty-reducing effect of international remittances.

Marx and Fleischer (2010) highlight that migrants are subject to less job security and lower paid work compared to local residents. Their access to social, health, and employment insurances are limited in the destination areas. Like China and several countries, Vietnam maintains a household registration system to manage public security and population movement (Demombynes and Vu 2016). People without a household registration book (or permanent residence permission) in an area have less access to public services such as education and health care. In China, Demurger et al. (2009) point out that the household registration system is one of the main determinants for the earnings gap between migrants and non-migrants. Liu (2015) uses the Vietnam Rural-Urban Migration Survey 2013 (VRUMS2013) and the Vietnam Household Living Standard Survey 2012 (VHLSS2012) to investigate the wage gap between migrants and non-migrants, and she finds that the migrants are more likely to have low-wage jobs than the non-migrants.

In this study, we not only examine the wage gap between migrant workers and native workers but also try to understand factors associated with this gap. To do so, we will use data from the 2009 Urban Poverty Survey to estimate the wage gap between migrants and non-migrants in the two largest cities in Vietnam. Then, the Oaxaca-Blinder decomposition technique will be used to decompose the wage gap into different components due to differences in demographic and education variables between the migrants and non-migrants.

The remainder of the paper is structured as follows. The second section introduces the data set used in this study. The third section describes the pattern of migration and characteristics of migrants in large cities in Vietnam. The fourth section presents the estimation methodology. Empirical findings will be presented in the fifth sections, and the sixth section concludes.

2 Data source

This study relies mainly on data from the Urban Poverty Survey (UPS), which was conducted by the Hanoi Statistics Office and the HCMC Statistics Office in October 2009. The survey sample is representative for Hanoi and HCMC. The main objectives of the 2009 UPS are to assess urban poverty in Hanoi and HCMC. Normally, household surveys often rely on a population frame which contains only registered households. As a result, household surveys tend to underestimate the proportion of migrants. The 2009 UPS has a special sampling selection design so that it covered not only the registered households but also unregistered households and individuals. In addition, it also sampled homeless individuals and those living in dormitories and company campuses.

Data from this survey are very detailed, including income, consumption, employment, education, health care, and risks. The number of observations of the 2009 UPS is 1637 and 1712 households for Hanoi and HCMC, respectively. It should be noted that these two cities contain not only urban but also rural areas. The number of urban and rural households in the data set is 2280 and 1069, respectively. In this study, we focus the

analysis on individuals who are above 14 years old and employed or wage earners. Self-employed individuals are excluded from the sample, since we do not have data on their wages. The number of individuals used in this study is 3778.

3 Migrants to large cities in Vietnam

A large proportion of people in Hanoi and HCMC are migrants from other areas. In this study, we define migrants as those who do not have a household registration book (called *Ho Khau* in Vietnamese) in Hanoi or HCMC. The household registration system has been implemented in Vietnam since 1964 to manage public security and population movement (Demombynes and Vu 2016). According to this system, a person has to register his/her residence in an local areas and is provided with a household registration book of that area (a permanent residence permission in that area). In other words, a household registration book is a statement that household members are permanent residents in one location. Having a registration book in an area, people are more easily to have access to social services such as education and health insurance in that area.

Prior 2007, the residence regulation in Vietnam requires that anyone who are living in a place other than their permanent residence over 30 days have to register their temporary status with the destination police. However, changing residential status was very complicated process because the migrants had to obtain a letter of release from sending authorities where they hold their registration book. It is much more complicated and difficult to get a permanent registration in cities. Since 2007, when the new Law on Residence took effect, many requirements and conditions in obtaining permanent residency are eased. According to the new Law, the number of residence status are just two—temporary and permanent, and the Law also removed any legal conditionality of employment for registration (Marx and Fleischer 2010). To obtain a registration book in Hanoi or HCMC, people must live in the city for at least 2 years (based on temporary residential booklet record) and prove that they have a legal residence place (a house or an apartment). Although transfer of registration books from one province to Hanoi or HCMCs is easier than before, it requires a complicated paperwork procedure (Demombynes and Vu 2016).

As mentioned, we define overall migrants as those who do not have a registration book in Hanoi or HCMC. To capture the short-term migration, we use the second definition in which a person is defined as a short-term migrant if she/he has no registration books and has lived in Hanoi and HCMC since 2008, i.e., have lived in the cities for less than 2 years.

It should be noted that non-migrants defined in this study include individuals who have a registration book (permanent residence permission) in Hanoi or HCMC. They can include people who have lived in the cities less than 2 years, but they have been able to obtain a registration book already. The definition of overall migrants and non-migrants does not depend on how long people have lived in the cities but on whether they have a registration book in the cities.

Figure 1 shows that the proportion of overall migrants, i.e., people without a registration book in Hanoi and HCMC, was 17.3 % in 2009. The proportion of short-term migrants, i.e., people having lived in the cities since 2008 and not

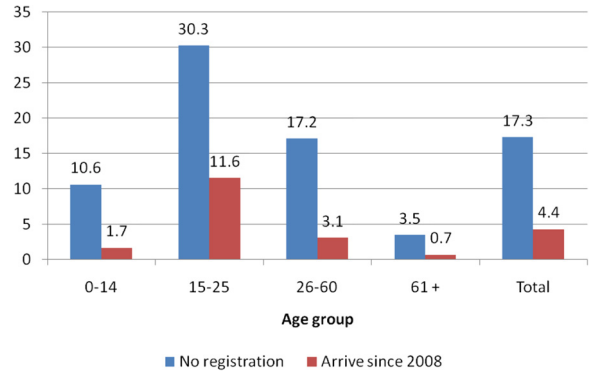

Fig. 1 Percentage of migrants by age. Source: Authors' estimation from the 2009 UPS

having a registration book, was 2.4 %. The proportion of migrants was very high among young adults aged from 15 to 25.

Table 1 compares the employment status between migrant workers and non-migrant ones in the two largest cities in Vietnam. Occupation of individuals are classified into six mutually exclusive categories. The proportion of unskilled and agricultural workers is much higher in migrants, especially in Hanoi. In Hanoi, the proportion of unskilled and agricultural workers is 34.7 and 55.2 % for overall migrants and short-term migrants, respectively. This figure is only 7.6 % for non-migrants.

Non-migrants tend to work in the public sector, while migrants are more likely to work in the private and foreign sector than non-migrants. Migrants tend to work in informal sectors (without labor contracts) and do not have health insurance. Migrants have much lower wages than non-migrants. Monthly wages of non-migrants are around 44 % higher than that of migrants. More specifically, monthly wages of migrants and non-migrants are equal to 2480 and 3590 thousand VND, respectively. Short-term migrants have even lower monthly wages, at 2066 thousand VND, less than one-half wages of non-migrants.

Table 2 presents basic characteristics of the migrants and non-migrants. Compared with non-migrants, migrants, especially short-term ones, tend to be younger and single and have lower education degrees. Migrants are more likely to live in a temporary house without tap water, in a house without concrete roof or a flush latrine than non-migrants. A large proportion of migrants are living in a dormitory. More specifically, 56.8 % of migrants and 65.7 % of short-term migrants lived in a dormitory in 2009.

4 Methodology

In this study, we use ordinary least squares (OLS) regression and propensity score matching to examine the wage gap between the migrant workers and non-migrant ones. To understand the factors associated with the wage gap, we use the Oaxaca-Blinder decomposition technique.

Table 1 Employment and wages of migrants and non-migrants

Variable	Both Hanoi and HCMC			Hanoi			HCMC		
	People with registration book	People without registration book	People without registration book and migrating since 2008	People with registration book	People without registration book	People without registration book and migrating since 2008	People with registration book	People without registration book	People without registration book and migrating since 2008
Proportion of workers by occupation (in percent)									
Manager and army	4.02	0.04	0.06	4.91	0.16	0.17	3.48	0.00	0.00
Technician	34.52	13.32	4.70	46.02	21.14	4.18	27.59	10.66	4.98
Service, clerk, officer	18.56	13.91	11.96	14.66	15.16	13.43	20.91	13.49	11.18
Skilled worker	16.32	24.07	24.64	16.08	22.13	20.61	16.47	24.73	26.78
Machine users	14.90	24.47	23.95	10.69	6.74	6.44	17.43	30.49	33.23
Unskilled and farmers	11.68	24.19	34.68	7.64	34.67	55.17	14.11	20.62	23.84
Proportion of workers by industry (in percent)									
Agriculture	1.11	0.68	1.06	0.93	0.43	0.68	1.22	0.76	1.27
Industry	38.87	58.20	59.38	33.89	35.37	29.19	41.88	65.96	75.36
Services	60.02	41.12	39.56	65.18	64.20	70.13	56.90	33.28	23.37
Proportion of workers by economic sector (in percent)									
State	35.22	5.86	2.52	51.72	9.76	3.26	25.27	4.53	2.13
Private firms	32.31	40.05	37.63	24.02	29.04	17.05	37.31	43.80	48.52
Households	20.65	35.74	44.57	14.41	50.42	68.60	24.42	30.75	31.85
Foreign	11.82	18.34	15.28	9.85	10.78	11.08	13.00	20.92	17.50
Monthly wage (thousand VND)	3590.3	2480.6	2066.1	3704.5	2590.3	2010.1	3521.3	2443.3	2095.8

Table 1 Employment and wages of migrants and non-migrants *(Continued)*

Proportion of workers having labor contract (in percent)	70.79	49.09	37.70	81.46	46.30	29.68	64.36	50.04	41.94
Proportion of workers having health insurance (in percent)	70.34	41.27	26.26	78.38	32.42	19.41	65.49	44.28	29.89
Number of observations	2008	1770	566	1122	777	294	886	993	272

Note: Non-migrants are individuals who have a registration book in Hanoi or HCMC. Migrants are individuals who do not have a registration book in the cities. Short-term migrants are migrants who have lived in the cities since 2008
Source: Estimation from the 2009 UPS

Table 2 Characteristics of migrants and non-migrants

Variable	Both Hanoi and HCMC			Hanoi			HCMC		
	People with registration book	People without registration book	People without registration book and migrating since 2008	People with registration book	People without registration book	People without registration book and migrating since 2008	People with registration book	People without registration book	People without registration book and migrating since 2008
Basic demography									
Age	34.82	28.32	26.00	35.90	29.63	29.49	34.18	27.87	24.15
% male	54.75	49.07	48.70	55.13	39.28	29.47	54.52	52.40	58.88
% never married	29.44	51.96	64.79	20.65	49.49	51.51	34.75	52.80	71.82
% living in urban areas	74.85	77.49	73.98	64.06	69.27	72.63	81.36	80.29	74.69
Proportion of workers by education degree (in percent)									
No degree	4.68	8.98	8.59	0.61	3.95	5.33	7.13	10.70	10.31
Primary	9.72	21.06	25.34	1.96	11.23	16.36	14.40	24.40	30.10
Lower secondary	21.84	33.24	37.19	17.15	30.23	40.76	24.68	34.26	35.31
Upper secondary	29.77	25.09	24.34	36.56	36.20	30.87	25.68	21.31	20.88
Post secondary	33.99	11.63	4.54	43.72	18.39	6.68	28.11	9.33	3.40
Household composition									
Household size	4.36	2.13	1.63	4.39	1.76	1.20	4.34	2.25	1.85
Percentage of children under 15 in household	19.35	7.53	2.92	20.90	5.84	2.25	18.42	8.11	3.28
Percentage of people above 60 in household	7.96	1.15	0.10	8.75	1.57	0.28	7.48	1.00	0.00
Proportion of workers who live in (in percent)									
Dormitory	2.46	56.76	65.73	0.43	55.01	66.75	3.68	57.36	65.19

Table 2 Characteristics of migrants and non-migrants *(Continued)*

House with concrete roof	41.65	18.77	17.58	71.84	31.07	24.15	23.44	14.59	14.10
House with flush toilet	92.06	81.16	72.93	91.38	70.70	53.15	92.47	84.71	83.40
House with tap water	67.71	35.96	31.47	75.43	53.17	36.42	63.05	30.10	28.84
Number of observations	2008	1770	566	1122	777	294	886	993	272

Note: Non-migrants are individuals who have a registration book in Hanoi or HCMC. Migrants are individuals who do not have a registration book in the cities. Short-term migrants are migrants who have lived in the cities since 2008
Source: Estimation from the 2009 UPS

4.1 Wage gaps between migrants and non-migrants

We use both OLS regression and propensity score matching to examine the wage gap between the migrants and non-migrants. Firstly, we regress log of wages on individual and community variables as follows:

$$ln(W_i) = \alpha + X_i\beta + M_i\gamma + \varepsilon_i, \tag{1}$$

where W_i is the monthly wages of individual i, X_i is a vector of individual and community variables of individual i, M_i is the dummy variable of migration status which is equal to 1 for migrants and 0 otherwise, and ε_i denotes the unobserved variables that follow a normal distribution with zero mean. The wage gap between the migrants and non-migrants is measured by γ. We tend to select more exogenous control variables including sex, age, education, marital status, urban, and dummy of Hanoi. The summary statistics of the control variables is presented in Table 8 in Appendix. We estimate model (1) using OLS regression.

Secondly, we use a propensity score matching method to estimate the wage gap as a sensitivity analysis in addition to the OLS regression.[1] The difference in wages between the migrant and non-migrants given observed variables X is expressed as follows:

$$\Delta E(W|X) = E(W|X, M = 1) - E(W|X, M = 0), \tag{2}$$

The matching method estimates the difference in the average wages between migrants and non-migrants who have similar distribution of the X variables. To match the non-migrants with migrants, we use a propensity score matching method (Rosenbaum and Rubin 1983). More specifically, we start by estimating the probability of being migrants conditional on the X variables using a probit model. The predicted probability is called the propensity score. Then, the non-migrants are matched with migrants based on the closeness of the propensity score. These matched non-migrants form the comparison group who have similar X variables as the migrants.[2] The difference in the wages between the migrants and the matched non-migrants is the wage gap controlled for the differences in the observed variables X. Compared with parametric regression, the propensity score matching relaxes the assumption on functional forms of monthly wages.

4.2 Decomposition of wage gaps

According to description analysis in the third section of this paper, there is a large gap in monthly wages between migrants and non-migrants in large cities. We use an Oaxaca-Blinder decomposition method to examine the factors associated with this wage gap. Firstly, we run separate regressions of log of monthly wages for migrants and non-migrants:

$$ln(Y_{\mathrm{m}}) = \alpha_{\mathrm{m}} + X_{\mathrm{m}}\beta_{\mathrm{m}} + \varepsilon_{\mathrm{m}}, \tag{3}$$

$$ln(Y_{\mathrm{nm}}) = \alpha_{\mathrm{nm}} + X_{\mathrm{nm}}\beta_{\mathrm{nm}} + \varepsilon_{\mathrm{nm}}. \tag{4}$$

The subscript i, which denotes individuals, is dropped for simplicity. Subscripts m and nm denote migrants and non-migrants, respectively.

The Oaxaca-Blinder decomposition technique is widely used to decompose gaps in a dependent variable between two groups into a gap due to differences in explanatory variables and a gap due to differences in coefficients of the

explanatory variables. The estimator of the gap in the monthly wages is presented as follows:

$$\begin{aligned}\Delta\hat{E}[ln(Y)] &= \hat{E}[ln(Y_{\mathrm{nm}})] - \hat{E}[ln(Y_{\mathrm{m}})] \\ &= \left(\hat{\alpha}_{\mathrm{nm}} + \bar{X}_{\mathrm{nm}}\hat{\beta}_{\mathrm{nm}}\right) - \left(\hat{\alpha}_{\mathrm{m}} + \bar{X}_{\mathrm{m}}\hat{\beta}_{\mathrm{m}}\right) \\ &= (\bar{X}_{\mathrm{nm}} - \bar{X}_{\mathrm{m}})\left(\frac{\hat{\beta}_{\mathrm{nm}} + \hat{\beta}_{\mathrm{m}}}{2}\right) + \left(\hat{\beta}_{\mathrm{nm}} - \hat{\beta}_{\mathrm{m}}\right)\left(\frac{\bar{X}_{\mathrm{nm}} + \bar{X}_{\mathrm{m}}}{2}\right) + (\hat{\alpha}_{\mathrm{nm}} - \hat{\alpha}_{\mathrm{m}}),\end{aligned} \tag{5}$$

where $\hat{\alpha}$ and $\hat{\beta}$ are estimators of parameters in regression (3) and (4). $\bar{X}_{\mathrm{m}}$ and $\bar{X}_{\mathrm{nm}}$ are the means of the explanatory variables of migrants and non-migrants, respectively.

The first term in Eq. (5) is the gap in monthly wages between migrants and non-migrants resulting from the difference in household characteristics. The second term can be explained as the difference in monthly wages resulting from the different returns to individual characteristics. The third term is the difference that is still unexplained by the current regression models of wages.

The Oaxaca-Blinder decomposition focuses on the effect of explanatory variables on the mean of wage gap between migrants and non-migrants. Recently, Machado and Mata (2005) propose a method to decompose the effect on the entire wage distribution. In this study, we simply focus on the wage gap mean, and as a result, we use the Oaxaca-Blinder decomposition method for simplicity. One problem with the Oaxaca-Blinder decomposition method is that the results are different when different groups, either migrants or non-migrants, are selected as the reference group. In this study, we tried different groups as the reference, and the results are very similar. For a neutral selection of a reference group, we use the average of explanatory variables and regression coefficients of migrants and non-migrants as the reference group (Eq. 5). In this paper, we will use the results from this selection for interpretation.[3]

5 Empirical results

5.1 Wage gaps between migrants and non-migrants

This section presents the empirical analysis of wage gaps between migrants and non-migrants in Hanoi and HCMC. Table 3 presents probit regressions of probability of migration and OLS regressions of monthly wages on migration status of employed individuals. Migration is most common among younger and more educated workers. Older people are less likely to move since migration is a human capital investment, and older workers have a shorter period to collect migration investment returns. The shorter payoff period decreases the net gain to migration; thus, it lowers the probability of migration (Borjas 2012).

Similar to descriptive analysis in Table 2, migrants are more likely to be single, since the cost of migration for a single individual is lower that for a whole family. Migrants have lower education than non-migrants even after the control variables such as age and gender are controlled.

As discussed in the previous section, migrants have substantially lower wages than non-migrants (Table 1). However, Table 3 shows that once observed variables are

Table 3 Regression of migration status and monthly wages

Explanatory variables	Probit: dependent variable is "overall migration"	Probit: dependent variable is "short-term migration"	OLS: dependent variable is "log of monthly wages"	OLS: dependent variable is "log of monthly wages"
Migration (migrant = 1, non-migrant = 0)			0.0164	
			[0.0248]	
Short-term migration (short-term migrant = 1, other individuals = 0)				−0.029
				[0.0314]
Age	−0.0589***	−0.0605***	0.0698***	0.0686***
	[0.0069]	[0.0108]	[0.0090]	[0.0091]
Age squared			−0.0009***	−0.0009***
			[0.0001]	[0.0001]
Sex (male = 1; female = 0)	−0.1471	−0.0876	0.2201***	0.2198***
	[0.1048]	[0.1513]	[0.0232]	[0.0232]
Never married (yes = 1)	0.2734**	0.6248***	−0.1098***	−0.1084***
	[0.1228]	[0.1733]	[0.0286]	[0.0285]
Urban (urban = 1; rural = 0)	0.5531***	0.3824**	0.0919***	0.0944***
	[0.1286]	[0.1919]	[0.0230]	[0.0225]
Hanoi (yes = 1)	0.0323	0.8329***	−0.0800***	−0.0786***
	[0.1111]	[0.1883]	[0.0237]	[0.0238]
No degree	Reference			
Primary	−0.0928	0.1652	0.067	0.0678
	[0.2709]	[0.3499]	[0.0601]	[0.0599]
Lower secondary	−0.4352*	−0.2894	0.1566***	0.1548***
	[0.2484]	[0.3346]	[0.0562]	[0.0562]
Upper secondary	−1.1291***	−1.1008***	0.3288***	0.3232***
	[0.2581]	[0.3682]	[0.0572]	[0.0574]
Post secondary	−1.9677***	−2.6512***	0.9042***	0.8957***
	[0.2651]	[0.4136]	[0.0615]	[0.0616]
Constant	1.3528***	−0.7005	6.1532***	6.1869***
	[0.3425]	[0.5561]	[0.1647]	[0.1661]
Observations	3778	3778	3778	3778
R-squared	0.14	0.16	0.40	0.40

Note: Non-migrants are individuals who have a registration book in Hanoi or HCMC. Migrants are individuals who do not have a registration book in the cities. Short-term migrants are migrants who have lived in the cities since 2008. Post-secondary education degrees include college, bachelor, and above. Robust standard errors in brackets (standard errors are corrected for sampling weights and cluster correlation)
*Significant at 10 %; **significant at 5 %; ***significant at 1 %
Source: Estimation from the 2009 UPS

controlled, the gap in monthly wages between the migrants and non-migrants is very small and not statistically significant. It means that the gap in wages between the migrants and non-migrants is mainly explained by the differences in the control variables.

Other control variables are statistically significant and have expected sign. Female workers tend to have lower wages than male workers. Married, older, and more educated workers have higher wages than single, younger, and less educated workers, respectively.

In Table 4, we include interactions between migration variables and age and age squared of workers to examine how the wage gap between migrants and non-migrants

Table 4 Regression of wages with interaction between migration and migrants' age

Explanatory variables	OLS: dependent variable is "log of monthly wages"	OLS: dependent variable is "log of monthly wages"	OLS: dependent variable is "log of monthly wages"	OLS: dependent variable is "log of monthly wages"
Do not have registration book	0.2337***	0.5313**		
	[0.0834]	[0.2447]		
Do not have registration book age*	−0.0073***	−0.0261*		
	[0.0026]	[0.0144]		
Do not have registration book age squared*		0.0003		
		[0.0002]		
Migration since 2008			0.1840**	0.5123**
			[0.0813]	[0.2353]
Migration since 2008 age*			−0.0075***	−0.0304**
			[0.0026]	[0.0151]
Migration since 2008 age squared*				0.0003
				[0.0002]
Age	0.0740***	0.0780***	0.0697***	0.0711***
	[0.0093]	[0.0110]	[0.0093]	[0.0097]
Age squared	−0.0009***	−0.0010***	−0.0009***	−0.0009***
	[0.0001]	[0.0001]	[0.0001]	[0.0001]
Sex (male = 1; female = 0)	0.2122***	0.2136***	0.2141***	0.2149***
	[0.0232]	[0.0231]	[0.0232]	[0.0232]
Never married (yes = 1)	−0.1106***	−0.1124***	−0.1092***	−0.1096***
	[0.0283]	[0.0282]	[0.0282]	[0.0282]
Urban (urban = 1; rural = 0)	0.0843***	0.0823***	0.0913***	0.0903***
	[0.0230]	[0.0232]	[0.0222]	[0.0223]
Hanoi (yes = 1)	−0.1099***	−0.1123***	−0.1070***	−0.1079***
	[0.0236]	[0.0238]	[0.0237]	[0.0237]
No degree	Reference			
Primary	0.0649	0.0649	0.0723	0.0712
	[0.0591]	[0.0591]	[0.0596]	[0.0596]
Lower secondary	0.1453***	0.1477***	0.1534***	0.1523***
	[0.0553]	[0.0551]	[0.0560]	[0.0561]
Upper secondary	0.3148***	0.3187***	0.3163***	0.3167***
	[0.0563]	[0.0561]	[0.0572]	[0.0573]
Post secondary	0.8794***	0.8830***	0.8809***	0.8809***
	[0.0606]	[0.0603]	[0.0615]	[0.0616]
Constant	6.0866***	6.0154***	6.1770***	6.1554***
	[0.1727]	[0.1985]	[0.1693]	[0.1755]
Observations	3778	3778	3778	3778
R-squared	0.40	0.40	0.40	0.40

Note: Non-migrants are individuals who have a registration book in Hanoi or HCMC. Migrants are individuals who do not have a registration book in the cities. Short-term migrants are migrants who have lived in the cities since 2008. Post-secondary education degrees include college, bachelor, and above. Robust standard errors in brackets (standard errors are corrected for sampling weights and cluster correlation)

*Significant at 10 %; **significant at 5 %; ***significant at 1 %

Source: Estimation from the 2009 UPS

varies across age. According to Borjas (2012), the wage gap is larger for younger workers and tends to be converge as the age of workers increases. If the migrants have high education and skills, their wage can be even higher than the wage of the local workers. In other words, there can be an inverted-U shape relation between age and wage gap between migrants and non-migrants. Table 4 shows that the interaction between migration and age-squared variable is not statistically significant. It implies that there is no an inverted-U shape or a U-shape relation between the wage gap and age. Interestingly, the interactions between age and migration are negative and statistically significant. The negative sign of the interactions means that the wage gap is larger for the older migrants than that for the younger ones. Possibly, younger migrants are more dynamic and able to find high-wage jobs than older migrants.

It should be noted that this finding is not absolutely contradictory to the prediction of Borjas (2012). According to our definition, non-migrants also include non-native people. There are migrants who obtained a registration book in Hanoi or HCMC. To test the hypothesis of the inverted-U shape relation in Borjas (2012), we need panel data on migrants and non-migrants. However, the panel data are not available in our study.

Table 5 presents estimates of the wage gap between the migrants and non-migrants using the propensity matching method. The propensity scores are estimated using probit models in Table 3. There is a large common support with 95 % of the treatment and control groups falling into the commune support. Figure 2 in Appendix presents the distribution of predicted propensity scores of the migrants and non-migrants. Similar to regression results, the wage gap estimated by the propensity score matching method is very small and not statistically significant.

5.2 Decomposition of wage gaps

There is a large gap in monthly wages between migrants and non-migrants in Hanoi and HCMC. When differences in observed explanatory variables are controlled for, this wage gap is small and not statistically significant. In this section, the Oaxaca-Blinder decomposition method is used to understand which explanatory variables contribute to the gap in monthly wages between migrants and non-migrants.

Tables 6 and 7 present separate regressions of monthly wages for migrants and non-migrants and decomposition of wage gaps. The last two columns present the contribution of the explanatory variables and returns to these variables to the total wage gap. The difference in the controlled variables contributes 97.1 percentage points to the wage gap (Table 6). Among the control variables, age and holding a post-secondary education degree are the most important factors contributing the wage gap. The returns to these control variables (contribution of β) is lower for the migrants than that for the non-migrants. The difference in the returns accounts for 30.8 percentage points of the wage gap. So the unobserved factors reduce the wage gap between the migrants and non-migrants by 27.9 percentage points.

Table 7 presents the decomposition of the wage gap between the short-term migrants and non-migrants. It shows that short-term migrants have substantially lower returns to human capital than non-migrants. As a result, the difference in the control variables contributes 85.1 percentage points to the wage gap, while the difference in the returns

Table 5 Estimates from propensity score matching

Matching scheme	Effect of "no registration book"				Effect of "migration since 2008"			
	Treated (migrant) (Y_1)	Controls (non-migrant) (Y_0)	Difference ($Y_1 - Y_0$)		Treated (migrant) (Y_1)	Controls (non-migrant) (Y_0)	Difference ($Y_1 - Y_0$)	
			Mean	Std. Er.			Mean	Std. Er.
1 nearest neighbor	2630.0	2539.6	90.4	113.8	2278.0	2312.6	−34.6	146.0
5 nearest neighbors	2630.0	2529.9	100.1	99.5	2278.0	2366.7	−88.7	93.5
Kernel, bandwidth 0.01	2630.0	2516.9	113.1	117.8	2280.3	2379.7	−99.5	109.1
Kernel, bandwidth 0.03	2630.0	2527.2	102.8	115.4	2278.0	2392.9	−114.9	106.1
Kernel, bandwidth 0.05	2630.0	2533.4	96.7	114.8	2278.0	2415.1	−137.1	104.5

Note: Treated are overall migrants and short-term migrants. Controls are matched non-migrants. Standard errors are calculated using bootstrap with 500 replications (standard errors are corrected for sampling weights and cluster correlation)

*Significant at 10 %; **significant at 5 %; ***significant at 1 %

Source: Estimation from the 2009 UPS

Table 6 Decomposition of wage gap between employees with registration book and employees without registration book

Variables	X_{nm}	X_m	β_{nm}	β_m	$(X_{nm} - X_m)*((\beta_{nm} + \beta_m)/2)$	$(\beta_{nm} - \beta_m)*((X_{nm} + X_m)/2)$	Contrition of X (%)	Contrition of β (%)
Age	34.823***	28.316***	0.0763***	0.0692***	0.4733***	0.2220	184.67***	86.61
	[0.299]	[0.377]	[0.0114]	[0.0111]	[0.0652]	[0.5279]	[32.65]	[209.17]
Age squared	1331.64***	892.82***	−0.0010***	−0.0009***	−0.4222***	−0.0387	−164.73***	−15.12
	[23.53]	[26.98]	[0.0002]	[0.0002]	[0.0625]	[0.2507]	[30.77]	[98.67]
Sex (male = 1; female = 0)	0.5475***	0.4907***	0.2120***	0.2402***	0.0128**	−0.0147	5.00***	−5.72
	[0.0136]	[0.0186]	[0.0305]	[0.0291]	[0.0053]	[0.0228]	[2.06]	[9.17]
Never married (yes = 1)	0.2944***	0.5196***	−0.1389***	−0.0376	0.0199***	−0.0412**	7.75***	−16.09**
	[0.0131]	[0.0187]	[0.0383]	[0.0314]	[0.0061]	[0.0203]	[2.49]	[8.09]
Urban (urban = 1; rural = 0)	0.7485***	0.7749***	0.1032***	0.0144	−0.0016	0.0676**	−0.61	26.39**
	[0.0112]	[0.0147]	[0.0308]	[0.0322]	[0.0013]	[0.0346]	[0.52]	[13.37]
Hanoi (yes = 1)	0.3763***	0.2537***	−0.1008***	−0.0209	−0.0075**	−0.0252**	−2.91***	−9.82*
	[0.0121]	[0.0135]	[0.0307]	[0.0308]	[0.0028]	[0.0137]	[1.14]	[5.29]
Primary	0.0972***	0.2106***	−0.0282	0.1741**	−0.0083	−0.0311*	−3.23	−12.15*
	[0.0082]	[0.0163]	[0.0834]	[0.0818]	[0.0069]	[0.0175]	[2.64]	[6.92]
Lower secondary	0.2184***	0.3324***	0.0664	0.2593***	−0.0186**	−0.0531*	−7.24***	−20.73*
	[0.0121]	[0.0169]	[0.0752]	[0.0786]	[0.0070]	[0.0296]	[2.73]	[11.78]
Upper secondary	0.2977***	0.2509***	0.2791***	0.3556***	0.0149**	−0.0210	5.80**	−8.18
	[0.0124]	[0.0164]	[0.0753]	[0.0806]	[0.0072]	[0.0296]	[2.84]	[11.66]
Post secondary	0.3399***	0.1163***	0.8633***	0.8006***	0.1860***	0.0143	72.58***	5.58
	[0.0121]	[0.0113]	[0.0786]	[0.0872]	[0.0196]	[0.0261]	[8.12]	[10.31]
Constant			6.0938***	6.1652***				
			[0.2110]	[0.2110]				
Observations			2008	1770				

Table 6 Decomposition of wage gap between employees with registration book and employees without registration book *(Continued)*

R-squared in regression			0.40	0.37	
Decomposition					
	$\ln(Y_{nm}) - \ln(Y_m)$	Contrition of X	Contrition of β	Contrition of α	Contrition of β and α
Absolute	0.2563***	0.2488***	0.0789	−0.0714	0.0074
	[0.0258]	[0.0198]	[0.3069]	[0.3132]	[0.0261]
Percentage	100***	97.10***	30.78	−27.88	2.90
	[0]	[10.21]	[121.03]	[123.80]	[10.21]

Note: Non-migrants are individuals who have a registration book in Hanoi or HCMC. Migrants are individuals who do not have a registration book in the cities. Short-term migrants are migrants who have lived in the cities since 2008. Robust standard errors in brackets. Standard errors are estimated using bootstrap with 500 replications (standard errors are corrected for sampling weights and cluster correlation)
*Significant at 10 %; **significant at 5 %; ***significant at 1 %
Source: Estimation from the 2009 UPS

Table 7 Decomposition of wage gap between employees with registration book and employees without registration book and migration since 2008

Variables	X_{nm}	X_m	β_{nm}	β_m	$(X_{nm} - X_m)^* ((\beta_{nm} + \beta_m)/2)$	$(\beta_{nm} - \beta_m)^* ((X_{nm} + X_m)/2)$	Contrition of X (%)	Contrition of β (%)
Age	33.592***	25.996***	0.0728***	0.0382***	0.4216***	1.0336**	107.46***	263.45**
	[0.251]	[0.648]	[0.0098]	[0.0138]	[0.0754]	[0.5042]	[20.35]	[137.03]
Age squared	1244.60***	781.70***	−0.0009***	−0.0006***	−0.3543***	−0.3615	−90.30***	−92.14
	[19.25]	[42.61]	[0.0001]	[0.0002]	[0.0649]	[0.2348]	[17.96]	[62.54]
Sex (male = 1; female = 0)	0.5353***	0.4870***	0.2197***	0.2229***	0.0107	−0.0017	2.72	−0.42
	[0.0122]	[0.0346]	[0.0251]	[0.0461]	[0.0084]	[0.0276]	[2.11]	[7.14]
Never married (yes = 1)	0.3327***	0.6479***	−0.1041***	−0.1873**	0.0459***	0.0408	11.71***	10.40
	[0.0112]	[0.0323]	[0.0298]	[0.0937]	[0.0170]	[0.0504]	[4.72]	[13.28]
Urban (urban = 1; rural = 0)	0.7575***	0.7398***	0.0935***	0.0885	0.0016	0.0038	0.41	0.97
	[0.0093]	[0.0306]	[0.0243]	[0.0546]	[0.0031]	[0.0446]	[0.81]	[11.49]
Hanoi (yes = 1)	0.3409***	0.3461***	−0.0785***	−0.0526	0.0003	−0.0089	0.09	−2.27
	[0.0099]	[0.0299]	[0.0258]	[0.0499]	[0.0022]	[0.0195]	[0.56]	[5.02]
Primary	0.1184***	0.2534***	0.0609	0.1085	−0.0114	−0.0089	−2.91	−2.26
	[0.0082]	[0.0295]	[0.0673]	[0.0823]	[0.0083]	[0.0201]	[2.18]	[5.21]
Lower secondary	0.2401***	0.3719***	0.1508**	0.1470*	−0.0196**	0.0012	−5.00**	0.29
	[0.0103]	[0.0307]	[0.0627]	[0.0799]	[0.0085]	[0.0322]**	[2.21]	[8.39]
Upper secondary	0.2880***	0.2434***	0.3250***	0.2626**	0.0131	0.0166	3.34	4.23
	[0.0104]	[0.0281]	[0.0634]	[0.1041]	[0.0098]	[0.0328]	[2.53]	[8.47]
Post secondary	0.2968***	0.0454***	0.8917***	0.9052***	0.2259***	−0.0023	57.58***	−0.59
	[0.0106]	[0.0107]	[0.0670]	[0.1367]	[0.0258]	[0.0259]	[7.65]	[6.68]
Constant			6.1056***	6.7598***				
			[0.1796]	[0.2509]				
Observations			2008	566				

Table 7 Decomposition of wage gap between employees with registration book and employees without registration book and migration since 2008 *(Continued)*

R-squared in regression			0.39	0.30	
Decomposition					
	$\ln(Y_{nm}) - \ln(Y_m)$	Contrition of X	Contrition of β	Contrition of α	Contrition of β and α
Absolute	0.3923***	0.3339***	0.7127**	−0.6542**	0.0585*
	[0.0296]	[0.0274]	[0.2999]	[0.3087]	[0.0330]
Percentage	100***	85.10***	181.66**	−166.76**	14.90*
	[0]	[7.85]	[81.02]	[83.69]	[7.85]

Note: Non-migrants are individuals who have a registration book in Hanoi or HCMC. Migrants are individuals who do not have a registration book in the cities. Short-term migrants are migrants who have lived in the cities since 2008. Robust standard errors in brackets. Standard errors are estimated using bootstrap with 500 replications (standard errors are corrected for sampling weights and cluster correlation)
*Significant at 10 %; **significant at 5 %; ***significant at 1 %
Source: Estimation from the 2009 UPS

to these variables contributes 181.7 percentage points to the wage gap. It also implies that factors that are not controlled in the model reduce the wage gap by 166.8 percentage points.

6 Conclusions

Vietnam is a transition country with an increasing migration. Although there is a large number of studies on migration and remittances in Vietnam, there have been no studies on the wage gap between migrants and non-migrants. Using a survey of households and individuals in Hanoi and HCMC, this study examines the characteristics of migrants and the wage gap between migrants and non-migrants. It finds that migrants in the cities are younger and less educated than non-migrants. With less experiences and low education, migrants are more likely to work in the informal sector and receive lower wages than non-migrants.

Using regression and propensity score matching analysis, we find that the wage gap between migrants and non-migrants is negligible once the observed variables are controlled for. In other words, migrants are not underpaid given their gender, marital status, age, and education. We use the decomposition techniques to understand factors contributing the wage gap between migrants and non-migrants. The difference in the means of controlled variables contributes mainly to the wage gap. Among these demographic variables, age and holding a post-secondary education degree are the most important factors contributing the wage gap. The returns to these variables is lower for the migrants than that for the non-migrants. However, the difference in the returns does not contribute largely and significantly to the wage gap.

The findings from this study imply that migrants in cities in Vietnam are not underpaid. There is no discrimination against migrants. The main reason why migrants have lower wages than non-migrants is the gap in age and education between migrants and non-migrants. To obtain higher wages, migrants should have better education and improve working skills through vocational training.

Endnotes

[1]Matching methods are widely used in impact evaluation (for review, see Heckman et al. 1997; Augurzky and Schmidt 2001; Imbens and Wooldridge 2009).

[2]Rosenbaum and Rubin (1983) show that a treatment and a control group can be matched based on the propensity score instead of the vector of X variables.

[3]Oaxaca-Blinder decompositions can have other expressions as follows, depending on which groups, migrants or non-migrants, are selected as the reference group:

$$\Delta E[ln(Y)] \;= (\bar{X}_{\mathrm{nm}} - \bar{X}_{\mathrm{m}})\hat{\beta}_{\mathrm{nm}} + \left(\hat{\beta}_{\mathrm{nm}} - \hat{\beta}_{\mathrm{m}}\right)\bar{X}_{\mathrm{m}} + (\hat{\alpha}_{\mathrm{nm}} - \hat{\alpha}_{\mathrm{m}}).$$

$$\Delta E[ln(Y)] \;= (\bar{X}_{\mathrm{nm}} - \bar{X}_{\mathrm{m}})\hat{\beta}_{\mathrm{m}} + \left(\hat{\beta}_{\mathrm{nm}} - \hat{\beta}_{\mathrm{m}}\right)\bar{X}_{\mathrm{nm}} + (\hat{\alpha}_{\mathrm{nm}} - \hat{\alpha}_{\mathrm{m}}).$$

For a neutral selection of the coefficients of the differences, we use Eq. (5) in this study.

Appendix

Table 8 Summary statistics of variables in regressions

Variables	Type	Mean	Std. Dev.
Monthly wages (thousand VND)	Continuous	3062.0	2577.9
Do not have registration book	Binary	0.469	0.499
Migration since 2008	Binary	0.150	0.357
Age	Discrete	31.132	10.718
Sex (male = 1; female = 0)	Binary	0.555	0.497
Never married (yes = 1)	Binary	0.439	0.496
Urban (urban = 1; rural = 0)	Binary	0.680	0.467
Hanoi (yes = 1)	Binary	0.503	0.500
No degree	Binary	0.049	0.215
Primary	Binary	0.134	0.341
Lower secondary	Binary	0.262	0.440
Upper secondary	Binary	0.300	0.459
Post secondary	Binary	0.255	0.436
Number of observations		3778	

Source: Estimation from the 2009 UPS

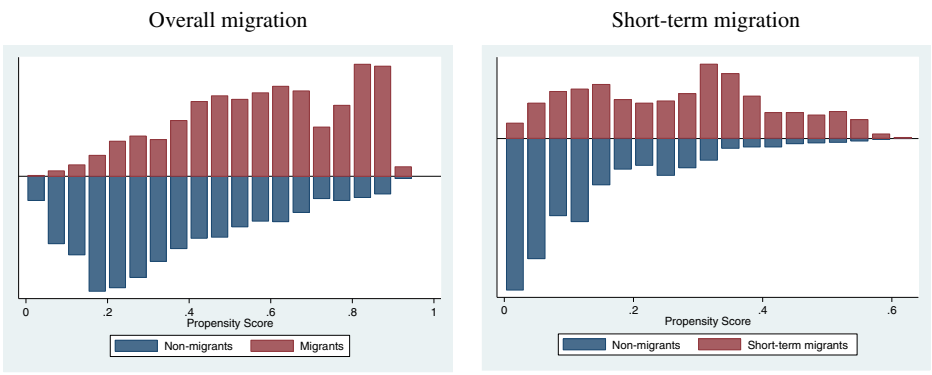

Fig. 2 Predicted propensity score of migration. Source: Authors' estimation from the 2009 UPS

Competing interest

The IZA Journal of Migration is committed to the IZA Guiding Principles of Research Integrity. The authors declare that they have observed these principles.

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References

Acosta P, Calderon C, Fajnzylber P, Lopez H. What is the impact of international remittances on poverty and inequality in Latin America? World Dev. 2007;36(1):89–114.

Adams RH, Page J. Do international migration and remittances reduce poverty in developing countries? World Dev. 2005;33(10):1645–69.

Antman F. Gender, educational attainment, and the impact of parental migration on children left behind. Discussion paper no. 6640. Bonn: Institute for the Study of Labor (IZA); 2010.

Augurzky B, Schmidt CM. The propensity score: a means to an end. IZA Discussion Paper Series No. 271. 2001

Beine M, Docquier F, Rapoport H. Brain drain and economic growth: theory and evidence. J Dev Econ. 2001;64(1):275–89.

Borjas GJ. Labor economics. 6th ed. Pennsylvania: McGraw Hill/Irwin; 2012.

Camarota SA. The wages of immigration: the effect on the low-skilled labor market. Washington D.C.: Center for Immigration Studies; 1998.

Cheng Z, Guo F, Hugo G, Yuan X. Employment and wage discrimination in the Chinese cities: a comparative study of migrants and locals. Habitat Int. 2013;39:246–55.

Chiswick BR. The effect of Americanization on the earnings of foreign-born men. J Poli Econ. 1978;86:897–921.

De Brauw A, Harigaya T. Seasonal migration and improving living standards in Vietnam. Am J Agri Econ. 2007;89(2):430–47.

Demombynes G, Vu L. Vietnam's household registration system. Washington, D.C.: World Bank Group; 2016.

Demurger S, Gurgand M, Li S, Ximing Y. Migrants as second-class workers in urban China? A decomposition analysis. J Comparative Econ. 2009;37(4):610–28.

Gagnon J, Xenogiani T, Xing C. Are migrants discriminated against in Chinese urban labor market? IZA J Labor Dev. 2014;3:17.

Harris JR, Todaro MP. Migration, unemployment and development: a two-sector analysis. Am Econ Rev. 1970; 60(1):126–42.

Heckman JJ, Ichimura H, Todd PE. Matching as an econometric evaluation estimator: evidence from evaluating a job training programme. Review of Economic Studies, Oxford University Press. 1997;64(4):605–54.

Hicks JR. The theory of wages. 2nd ed. London: Macmillan; 1932. p. 76.

Imbens G, Wooldridge J. Recent developments in the econometrics of program evaluation. J Econ Lit. 2009;47(1):5–86.

Katseli LT, Lucas R, Xenigiani T. Effect of migration on sending countries: what do we know? OECD Development Centre, WP No. 250. Research Programme on: Economic and Social Effects of Migration on Sending Countries. 2006.

Kochar A. Urban influences on rural schooling in India. J Dev Econ. 2004;74:113–36.

Lall SV, Selod H, Shalizi Z. Rural-Urban migration in developing countries: a survey of theoretical predictions and empirical findings. World Bank Policy Research Working Paper 3915, 2006.

Lee L. Decomposing wage differentials between migrant workers and urban workers in urban China's labor markets. China Econ Rev. 2012;23:337–45.

Liu PW, Zhang J, Chong S. Occupational segregation and wage differentials between natives and immigrants: evidence from Hong Kong. J Dev Econ. 2004;73:395–413.

Liu AYC, Kawata K. Labor market and the native-immigrant wage gap: evidence from urban China. RIETI Discussion Paper Series 15-E-142, Dec. 2015.

Machado J, Mata J. Counterfactual decomposition of changes in wage distributions using quantile regression. J Applied Econometrics. 2005;20(4):445–65.

Marx V, Fleischer K. Internal migration: opportunities and challenges for socio-economic development in Vietnam, the programme coordination group on social and economic policies of the United Nations in Vietnam. 2010.

Maurer-Fazio M, Connelly R, Ngoc-Han TT. Do negative native-place stereotypes lead to discriminatory wage penalties in China's migrant labor market?. IZA Discussion Paper No. 8842, Feb, 2015.

McKenzie DJ. In: Ozden C, Maurice SM, editors. Beyond remittances: the effects of migration on Mexican households in international migration, remittances, and the brain drain. 2006.

Meng X, Zhang J. The two-tier labor market in urban China: occupational segregation and wage differentials between urban residents and rural migrants in Shanghai. J Comparative Econ. 2001;29(3):485–504.

Meng X. Labor market reform in China. Cambridge: Cambridge University Press; 2000.

Mountford A. Can a brain drain be good for growth in the source economy? J Dev Econ. 1997;53:287–303.

Nguyen C, Mont D. Economic impacts of international migration and remittances on household welfare in Vietnam. Int J Dev Issues. 2012;11(2):144–63.

Nguyen VC, Berg MV, Lensink R. The impact of work and non-work migration on household welfare, poverty and inequality: new evidence from Vietnam. Econ Transit. 2011;2011:1–29.

Nguyen VC. Do foreign remittances matter to poverty and inequality? Evidence from Vietnam. Econ Bull. 2008; 15(1):1–11.

Nguyen VC, Berg MV, Lensink R. The impacts of international remittances on income, work efforts, poverty and inequality: new evidence for Vietnam. In: Robert JC, Demirguc-Kunt A, Morduch J, editors. Banking the world: empirical foundations of financial inclusion. Cambridge: The World Bank and MIT Press; 2013.

Nguyen TP, Tran NTMT, Nguyen TN, Oostendorp R. Determinants and impacts of migration in Vietnam, Depocen Working Paper Series No. 2008/01, Hanoi, Vietnam. 2008.

Özden C. In: Ozden C, Maurice S, editors. Educated migrants: is there brain waste? In international migration, remittances, and the brain drain. 2006.

Özden C, Maurice S. International migration, remittances, and the brain drain. A co-publication of the World Bank and Palgrave Macmillan. 2006.

Rosenbaum P, Rubin R. The central role of the propensity score in observational studies for causal effects. Biometrika. 1983;70(1):41–55.

Silver A. Families across borders: the effects of migration on family members remaining at home. Int Migr. 2014;52(3):194–220.

Stark O, Helmenstein C, Prskawetz A. A brain gain with a brain drain. Econ Lett. 1997;55(2):227–34.

Stark O. The migration of labour. Cambridge: Harvard University Press; 1991.
Stark O, Bloom D. The new economics of labor migration. American Econ Rev. 1985;75:173–8.
Stark O, Taylor J. Migration incentives, migration types: the role of relative deprivation. J Econ. 1991;101:1163–78.
Taylor JE, Mora J, Adams R, Lopez-Feldman A. Remittances, inequality, and poverty: evidence from rural Mexico. Mimeo: University of California; 2005.
Wang HN, Guo F, Cheng ZM. Discrimination in migrant workers' welfare entitlements and benefits in urban labor market: findings from a four-city study in China. Populat Space Place. 2013. doi:10.1002/psp.1810.

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