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Wage determination and distribution in urban China and Vietnam: A comparative analysis

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ABSTRACT

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Wages are higher in China than in Vietnam. Using data from the Chinese Household Income Project 2002 and the Vietnam Household Living Standards Survey 2002, this paper aims to understand the sources of the wage differences between the two countries. The decomposition results show that for men (women), differences in returns to observed wage determinants contribute more to the inter-country wage gap for most of the wage distribution (the part of the distribution beyond the 20th quantile). Differences in returns to industry are especially important contributor to the wage structure effect for males. For females, differences in the returns to education and experience are the important contributors to the wage structure effect at the middle of the wage distribution. At the low end of the female wage distribution, differences in the distribution of education and experience are the main factors. Despite the lower wages, the relatively lower skilled workforce and the less competitive industry, as a result of the less extensive ownership and trade reforms and slower pace of change in education policy, may erode Vietnam's attractiveness. *Journal of Comparative Economics* **43** (1) (2015) 186–203. National Institute for Labour Studies, Flinders University, Australia; Crawford School of Economics and Government, The Australian National University, Australia.

1. Introduction

There has been a growing literature that compares wages across countries and investigates what factors can explain the wage differentials between them. For example, Blau and Khan (1996) compare the distributions of male wages across ten industrialised countries to examine to what extent the cross-country differences can be explained by different returns to education; Donald et al. (2000) examine the differences in wage distributions between the USA and Canada by simulating counterfactual density functions; Bargain et al. (2009) employ Oaxaca–Blinder decomposition and quantile regression decomposition methods to examine earnings differences at the mean and at different points of the wage distributions between Chinese and Indian workers. Others, such as Newell and Reilly (2001), compare the gender wage gap of the

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transitional economics in Eastern Europe. So far, little attention has been directed to compare wages between transitional economies in Asia.

This study is an attempt to fill in the void in the literature by comparing the determination and distributions of wages between Chinese and Vietnamese workers. China and Vietnam have undergone significant structural changes after the introduction of market reforms. Labour market conditions have changed dramatically in recent decades, including institutional transformations and globalisation. Strong economic growth in China and Vietnam during liberalisation of their centrally-planned economies has attracted a lot of interests from the research community. Wage determination has been analysed for each country separately, including numerous studies of different aspects of the labour market for various time periods.[1] However, no systematic attempt has been made to compare labour outcomes between the two countries so far. Investigating the underlying reasons for wage differences between the two countries could be useful for understanding economic development processes in general as the two countries went through important reform processes and therefore inform the design of various economic policies (such as labour market policies and education policies) in transitional economies.

This study can, to some extent, also been seen as a timely contribution in the context of raising labour costs in China and its implications to international investors conducting business in developing countries.[2] While factors such as locational choice and competitiveness of firms are beyond the scope of this study, understanding the determinants that have shaped the differences in wage costs between China and Vietnam is of particular interest. Rising wages in China has recently been reported in international news headlines. Investors are starting to rethink where to locate their production facilities and whether to relocate to a lower-cost country. Vietnam has been suggested as an alternative (Roberts, 2006; The Economist, 2012). At the aggregate level wages in Vietnam are lower than in China. However, relying on the unadjusted wage gap to provide an aggregate measure of the relative wage cost between the two countries would potentially conceals the factors that explain the relative wage differences.

As far as we are aware, this is the first attempt to compare wages between China and Vietnam. Empirically, we make use of the Mincer equation to apply the unconditional quantile regressions and associated decomposition methods (Firpo et al., 2007). Not only does this approach allow us to examine the extent to which the observed wage gap is accounted for by differences in worker characteristics (referred to as 'composition effect' hereafter) and differences in returns to the characteristics (referred to as 'wage structure effect' hereafter), it also enables us to investigate the extent to which a particular wage covariate contributes to the China–Vietnam wage gap. This is particularly important in understanding the relative differences in wage determination and the wage outcomes between the two countries.

The rest of the paper is arranged as follows. Section 2 provides a brief description of the institutional background of the two countries. Sections 3 and 4 describe the data and methodologies respectively. Section 5 presents the estimation results. Finally, in Section 6, we set out our conclusions.

2. Transformation of labour markets of China and Vietnam

It is well-established that the wage level of a transitional economy is an outcome of the pace of changing labour market conditions during economic transition (Meng and Kidd, 1997; Liu, 2004). In the context of inter-country comparison, it is reasonable to regard the relative wage level of the two transitional economies as an outcome of the relative pace of changing labour market conditions. In standard labour market analysis, the relative demand (e.g. the relative skill requirements due to technological change) and relative supply factors (e.g. the relative supply of skilled workers) are to explain wage differential. Based on this general framework, we propose several factors that may affect the relative wage level between China and Vietnam amid the changing labour market institution. These factors include the relative pace of the state-owned enterprises (SOEs) reform, the relative degree of trade liberalization, the relative shift of industrial structure and the relative development of higher education.

Reforming the inefficient labour market is one of the common features characterising the market reforms of China and Vietnam. The early labour market reforms consisted of two main components. First, a labour contract system was introduced to change the lifetime employment arrangement and provide enterprises with the autonomy to hire and dismiss their workers. Second, enterprises were allowed to keep part of their profits for the purpose of paying performance-related bonus to their employees. As a consequence, skill-based wage differentials widened and a closer link was established between wages and workers' productivity within a firm (Meng, 2004; Knight and Song, 2003; Liu, 2004).

Reforming inefficient SOEs took the central stage in both China and Vietnam. In China, significant changes have occurred only two decades after the start of market reforms in 1978.[3] Larger employment share aside, the Chinese SOEs have assumed extensive social welfare functions, such as health care, housing, and childcare, which are beyond their productive functions. This made laying off workers more difficult prior to necessary reforms of the social welfare system to de-link these benefits from

[1] This has set this paper apart from other studies, such as Liu et al. (2000) on sectoral wage gap and Su and Heshmati (2011) on gender wage gap in China; Pham and Reilly (2007) and Liu (2004) on gender wage gap in Vietnam; or on state-owned enterprise reform (Imbert (2013) for Vietnam; Meng and Kidd (1997) for China).

[2] While wage costs are important, they are not the only factor that affects the location and the competitiveness of international investments. Physical infrastructure, macroeconomic stability, laws and order, political environments, and so on, are also important factors that affect the decision.

[3] While reforms started in 1978, concerted reforms in SOEs did not begin until the mid-1980s. Even then, up to the mid-1990s, the reforms were limited to changing management incentives within state ownership. These efforts did not yield much benefit until mid-1990s.

individual enterprises (O'Connor, 1998). While China's SOE reforms proceeded very slowly, China is well ahead of Vietnam in terms of its commitment to reform (Vu, 2009). The radical labour market reform *xia gang* was endorsed in 1997.[4] It aimed at laying-off a quarter or more SOE workers within a four-year period.[5] While SOEs still made up a substantial part of the national economy in terms of total industrial assets, their employment share in the economy continued to decline in the past decade. In 2001, SOEs in China accounted for only one-third of the employment in the industrial sector, compared to two-thirds in 1995 (Gupta and Palit, 2010). Subsequently, the wage level of state sector rose and surpassed that of non-state sector in 2000 (Yang et al., 2010). According to Démurger et al. (2006), the active policies launched by the Chinese government in the late 1990s to increase public sector wages to retain skilled workers was also responsible for the higher wage level of state sector. The Chinese government also put in place some long-term strategies for SOEs, including building a market economy framework in which SOEs (and for all firms in China) will operate; as well as restructuring industries that will build up SOEs' capacity to compete globally (Chiu and Lewis, 2006).

In Vietnam, SOE restructuring had occurred roughly in parallel with other reforms such as price liberalisation and market deregulation. SOE restructuring led to a dramatic decrease in the level of employment in SOEs in the early 1990s shortly after the onset of *Doi Moi*, meaning 'renovation' (O'Conner, 1996). Nonetheless, the overall impact of SOE reform on the Vietnamese society was not as noticeable as in China because Vietnam's state sector employed a relatively smaller percentage of the country's entire labour force. In addition, state credit allocations continued to favour state enterprises. Foreign investors typically entered into partnership with state firms, and they encountered relatively fewer difficulties than did private firms. The expansion of SOEs[6] helped to cushion Vietnam from widespread unemployment (Van Arkadie and Mallon, 2003). Relative to China, the unemployment rate in Vietnam did not rise rapidly in the late 1990s. Not until 2000 was the Enterprise Law revised. The Enterprise Law aims to give the private sector a level playing field and to simplify the process of firm registration, paving the way for Vietnam to join the WTO in 2007. Subsequently, the number of private business registrations grew rapidly during 2000–2002. Undeniably, the WTO membership reduced the extent to which Vietnamese government could favour the state owned sector. However, preferential treatment of the SOEs has by no means been eliminated. Perkins and Vu (2009) conclude that 'in the case of Vietnam, there are still those trying to find a way to continue supporting SOEs that cannot compete internationally.' The extent to which the SOEs reform impacted differently on the re-allocation of labour force across different sectors would have had implications on the relative wages between China and Vietnam.

Contemporaneously with ownership restructuring was a significant change in the industrial composition of employment. Opening to trade could be one possible source.[7] Trade liberalisation (i.e. removal of tariffs and non-tariff barriers) would change the relative price of tradable and non-tradable goods. For instance, in Vietnam, trade liberalisation brought about faster growth in non-tradables and in the import-substitution industries (Hill, 1998; Packard, 2006). Consequently, employment shares in industries such as construction, mining, and utilities increased faster than other industries. In general, average wages tended to be higher in the non-tradable and import-substitution industries (Packard, 2006).

Given that China embarked on trade liberalisation earlier and committed to it more strongly than Vietnam during the reform process, tradable industries in China would have associated with proportionately larger reduction in protection in comparison to that of Vietnam.[8] Consequently, relative wages between tradable and non-tradable industries, as well as relative wage gap between the two countries would have been impacted.

Another noticeable development is a significant change in the industrial structure occurred in terms of skill/technology content (from low-tech to medium- and high-tech sectors). The relative skill/technology content of a job would have influenced how experience and education of a worker is valued in Vietnam relative to that in China.

While both China and Vietnam moved up the value chain, Vietnam lags behind China. In particular, Vietnam's export is not up high in the chain of technology relative to China. For instance, most of Vietnam's exports remain traditional and labour-intensive products (e.g. products of food processing, textiles and garments, footwear, and a variety of other labour intensive industries); whereas the Chinese products are more technically sophisticated (Tran, 2010; Chaponnière et al., 2008). Work experience in labour intensive industries tends not to be awarded as much as work experience in technically sophisticated industries. This may particularly impact adversely more on females as they tend to concentrate in export industries.

The shift in industrial structure also drove a rapid increase in demand for higher education and returns to education after the introduction of market reforms. Consequently, both China and Vietnam experienced education expansion during their reforms with the establishment of private high education institutions. Vietnam, however, started from a small base. In

[4] *Zhuada fangxiao* ("grasping the big, enlivening the small" – 抓大放小) is the central doctrine of the SOEs reforms endorsed by the 15th Party Congress in September 1997. The doctrine refers to the central government should maintain control over the largest SOEs; but should relinquish control over smaller SOEs. Hence, workers were forced to go "off-duty" or *xiagang*. The massive restructuring was a response largely to the large financial losses of SOEs inflicting on the fiscal and financial systems (Liew, 2001).

[5] Between 1995 and 2001 about 43 million workers were laid off (Ministry of labour and Social Security, 2002). Naughton (2007: 313) estimated that as a result of the SOE downsizing, the number of retrenched SOE workers reached 28 million, about half of the SOE workforce, and the number of SOEs was reduced (by 74%) from 120 thousand in the mid-1990s to 32 thousand in 2004. SOE downsizing was particularly felt in the urban area. Urban unemployment rose sharply (Meng, 2004).

[6] For the period 1995–96 state–foreign joint ventures could account for almost one-third of SOEs output, and that share has been rising ever since. The SOE employment share relative to wage employment grew almost one percent from 1993 to 1998 (Gallup, 2004).

[7] For example, study by Robertson (1999) on U.S. and Mexico.

[8] According to the Economy Watch, in 2010, the tariff rate of China and Vietnam is 4.2 and 10.6 percent respectively (http://www.economywatch.com/economic-statistics/economic-indicators/Tariff_Rate/).

1993, the share of individuals in the relevant age group participating in higher education was only 2% (Sheridan, 2010). At the turn of the century, the enrolment in higher education in Vietnam was still relatively low by international standard. In contrast, the Chinese government made a decision in 1999 to increase tertiary enrolments by as much as 40%. This deliberate expansion of higher education significantly increased the supply of skilled labour by the early 2000s. The relative supply of skilled and unskilled labour may potentially affect returns to education and subsequently, the relative wage gap between the two countries.

In addition to the structural factors discussed above, one might have expected other labour market institutions, such as trade unions and minimum wage policy, may also have an impact on wage determination in the two countries.

There are well organised trade unions in both China and Vietnam. However, unlike their counterparts in the industrialised countries where trade unions are independent of the governments and represent their members in negotiating wages and employment conditions with employers, trade unions in China and Vietnam are an integral part of the party-state apparatus, with a role of harmonising the interests of labour and management rather than to represent the interests of their members in opposition to management (Clarke and Pringle, 2007). As a result, the role of trade unions in determining wages is very limited; and at the workplace level individual wages of employees are largely dictated by the management in the two countries. Unfortunately in the datasets used for this study, there is no information on worker's union membership status and as a result, we cannot examine union impacts on the wages of China and Vietnam.

Minimum wages exist in both China and Vietnam to provide a guideline for basic wages and protect low paid workers from exploitation. However, there is evidence that minimum wage policy is not effectively enforced in either country (see Dang (2012) for Vietnam; Zenglein (2008) for China). In China, provincial governments, and in some cases lower level governments, have the discretion in setting minimum wages within their region. In Vietnam, minimum wages are centrally determined by the government. However there are also geographic differentials (Clarke and Pringle, 2007). The differentials of minimum wages across regions in each country likely reflect local economic conditions such as industrial structure and the costs of living. The variables on industry and regions may to some extent account for the potential impact of minimum wages.

3. Data

3.1. Data source

This paper uses the Vietnam Households Living Standard Survey 2001–2002 (VHLSS02) and the China Household Income Project (CHIP) 2002 survey. As CHIP 2002 is the first CHIP survey available after the SOEs reform in the late 1990s, we use VHLSS02 for comparison purposes. As with the VHLSS data, the CHIP data is large and very comprehensive. Both surveys collected data on earnings, age, education, gender, industry, occupation, ownership types of individual workers and their household characteristics. The VHLSS02 was conducted by the General Statistic Office of Vietnam, with technical assistance provided by the World Bank. The CHIP survey was designed by the Institute of Economics at the Chinese Academy of Social Sciences. The sampling frame of CHIP is based on that used in the annual national household survey of the National Bureau of Statistics (NBS). In 2002 the CHIP sample covered 12 out of China's 31 provinces.[9] CHIP is one of the most representative household survey data in China.

Following the footsteps of the literature, especially those on labour outcomes in China (for example, Meng, 2004; Gustafsson and Li, 2000), we restrict our analysis to the urban sample as the impacts of market reforms on labour outcomes were more likely to be felt in urban areas where wage employment is concentrated.[10] The samples for empirical analysis include urban wage earners between 18 and 60 years old who worked in the preceding 12 months and who supplied earnings data (VHLSS02: 6896 observations with 4035 being men; CHIP02: 8910 observations with 5033 men).

The VHLSS02 survey over-sampled certain specific domains, and the supplied weights are used in both descriptive and regression analyses to account for this. No weights are supplied with the Chinese data. The weights are assumed to be one for all observations in the CHIP sample. To account for the complex sampling strategy of the VHLSS02, the bootstrapping method is used to obtain the standard errors of estimates.

Rural–urban migration is undoubtedly an important dimension of the urban labour market. Unfortunately this information is not collected in the VHLSS02. For the purpose of decomposition we exclude migrants in the Chinese sample.[11] Consequently, we may understate the employment share of the Chinese urban private sector and may over-estimate wages at the lower end more for China than for Vietnam.

3.2. Variables

The outcome variable log wages is defined as log hourly earnings in the main job in the twelve months prior to the survey interview. Earnings refer to total employment income of various types, including basic wages or salary, bonus, subsidies and

[9] The twelve provinces are Beijing, Shanxi, Liaoning, Jiangsu, Anhui, Henan, Hubei, Guangdong, Sichuan, Chongqing, Yunnan and Gansu.

[10] Yang and Fang (2000) discuss the details of China's reform that has impacted rural and urban areas differently in many aspects. In addition, labour quality, including education and experience, is different between the two areas (see also footnote 28). Hence, it may not be appropriate to generalise the results of this paper to rural China.

[11] The CHIP2002 surveyed migrants in 28 cities across 12 provinces. Many studies, for example Li (2008) and Knight et al. (2011), use CHIP 2002 to examine migrant workers in China.

in-kinds. In order to make the earnings variable comparable across countries, we transform earnings into the USD equivalent using the Purchasing Power Parity (PPP) conversion factors for consumption provided by the World Development Indicators (WDI) that incorporated the results of the 2005 round of the International Comparison Program.[12] Using PPPs instead of the official exchange rates[13] to convert currencies makes it possible to compare the output of economies in real terms. While PPP is not without limitations,[14] it is commonly used in cross-country comparisons (e.g. Donald et al., 2000; Bargain et al., 2009).

While several methods have been suggested to construct aggregated PPP indices, the Geary–Khamis (GK) method and the Elteto–Köves–Szulc (EKS) approach are commonly used. The Penn World Table (PWT) and the WDI of the World Bank use the GK method, and the Eurostat and the OECD use the EKS approach. Since PPP calculations can be sensitive to the choice of a methodology, we would ideally use alternative PPP estimates to check the robustness of our results. However, International Comparison Program (ICP) prior to 2005 did not include China. Following the footstep of Bargain et al. (2009) we simply report alternative GDP per capita figures from Ackland et al. (2013) to show that the two methods generate different estimates for China and Vietnam but they are of the same order of magnitude. While the PWT 1996 measures are $2969 and $1652 for China and Vietnam, their imputed EKS estimates are $2646 and $1459; and their imputed GK are $3230 and $1734 respectively.[15] Hence, the ratio of the three different estimates between the two countries is similar (a ratio of 1.81 with EKS, 1.86 with GK and 1.80 with the PWT measures).

In addition, the GDPs PPP per capita for both China and Vietnam were substantially revised downward in the 2005 ICP, relative to the 2005 WDI based on old extrapolations. The revision for China of GDP per capita is larger than that for Vietnam (−39% versus −31% respectively) (Deaton and Heston, 2010; Milanovic, 2008). While the magnitude of the revision of the GDP per capita is not exactly the same, the revisions go in the same direction and are within a reasonable range. Hence, the adjusted wage levels reported for China and Vietnam in this paper may compare the two countries fairly well.[16,17]

Given the complexity in measuring various policy measures and complicated channels of policy effects, it is difficult, if not impossible, to capture all dimensions of the reform. In this paper, we take a snapshot view of their labour outcomes that could potentially be shaped by different reform processes in some well-defined dimensions that are directly observable and easily measured. These are widely accepted dimensions with immense policy importance. Hence, for the wage covariates, in addition to two sets of key human capital variables educations and work experience (i.e. potential experience and its square), we also consider the following variables: demographic characteristic (a marital status dummy); four ownership dummies (i.e. state sector,[18] collectives, private and foreign owned firms)[19]; and eleven industry dummies (i.e. manufacturing, agricultural and mining, construction, transportation and telecommunication, government administration and party, finance, cultural activities, services, Wholesales and retails, electricity, and other industries).[20] To account for heterogeneity of local

[12] The WDI online query and the results of the 2005 International Comparison Program are available at http://ddp-ext.worldbank.org/ext/DDPQQ/member.do?method=getMembers&userid=1&queryId=137 and http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/ICPEXT/0..menuPK:1973757~pagePK:62002243~piPK:62002387~theSitePK:270065,00.html respectively.

[13] The official exchange rate for China was 8.28 *Yuan* and Vietnam 15279.5 *dongs* for one U.S. dollar in 2002 (PWT6.3). The PPP exchange rates of the 2005 ICP for the Yuan (*Dongs*) *vis-à-vis* the Dollar is much below the official exchange rates. Official exchange rates tend to ignore the affordability and price level of necessities and luxuries.

[14] For instance, the PPPs are based on prices of consumption items. Hence, the PPP estimates for developing countries are influenced by the spending patterns of their developed counterparts. Also, the PPPs are derived using national average expenditure weights. Therefore, goods that are important to the poor attract proportionally less weight. (http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/ICPEXT/0,,contentMDK:20975195~pagePK:60002244~piPK:62002388~theSitePK:270065,00.html).

[15] These measures are based on the PWT 1996 estimates of real GDP per capita (derived by extrapolation from the ICP sample).

[16] Arguably using market exchange rates instead of PPP will better reflect market competitiveness. However, China had kept the exchange rate at RMB8.28/US until 21 July 2005. Vietnam officially has a managed floating exchange rate system that functions like a fixed exchange rate system, with the actual daily fluctuations in general been much smaller despite fluctuations of ±0.25% are in principle permitted (McKinnon and Schnabl (2009) for China and Camen (2006) for Vietnam). Therefore, official exchange rate for both countries may not reflect the same 'competitiveness' as in other countries with free floating exchange market. While the black market exchange rates may be a better proxy of market exchange rates than the official exchange rate, the lack of information and the volatility of it has made it hard to track.

[17] We used the official exchange rates to test the sensitivity of the results. While the PPP exchange rate tends to be lower than the official exchange rate in general, it is more so for Vietnam than for China. Therefore, the wage gap, using the official exchange rates, between the two countries would be about 0.3 log point larger than if the PPP exchange rate is used. Consequently, we found that, when the PPP was replaced by the official exchange rates, (a) only the estimates for the constant terms changed and this did not have impacts on the coefficient estimates for the regression results in Tables 2a and 2b; (b) for the DFL decomposition, the share of the earnings gap accounted for by the wage structure effect increased in line with the wider earnings gap when using official exchange rates, but the composition effect remained unchanged because replacing the PPP by the official exchange rates did not affect the distributions of the wage covariates (Detailed results are available upon request from the authors); (c) as a result of (a) and (b), for the UQR decomposition, the unexplained component of the wage structure effects increases in line with the increase in the gap.

[18] The samples include civil servants. While civil servants can be identified separately in the datasets, dropping them may not be appropriate since doing so would cause sample selection problems. That is, those workers who are not civil servants may be systematically different from those who are. Besides, wages of civil servants are affected by market forces as well since the public sector as a whole needs to compete with private enterprises for labour. Studies such as Démurger et al. (2012) in China and Imbert (2013) in Vietnam reported an increased competition between the public and private sectors to attract the best workers. In addition, we have included industry variables in the empirical model. 'Government administration and party' is one of the industry dummies. Since civil servants and workers in the 'Government administration and party' industry largely overlap in both countries, the inclusion of the 'Government administration and party' in the set of industry variables means that the potential bias of not modelling civil servants as a separate variable would be minimal. Further, the overlapping of the two variables also means that there would be multicolinearity problems if both variables were included in the model.

[19] Arguably the country of origin of foreign enterprises might influence wage policy. Unfortunately neither the CHIP nor the VHLSS collect this information. This has precluded us from including this variable in the model.

[20] We are mindful of the potential correlation between education and occupation. Hence we exclude occupation from the model. Nonetheless, we experimented with an alternative model that includes occupation. This does not change the patterns of the main results.

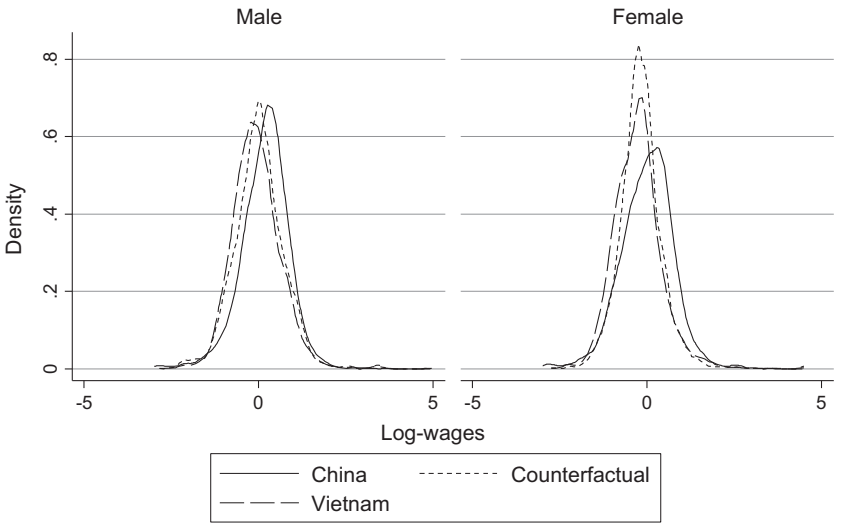

Fig. 1. Actual and counterfactual log-wage densities.

labour markets and the differential effects of regional living costs on wages, we also include a dummy indicating whether an individual resides in a region that is below the average household income to facilitate across country comparison.[21] Great care has been taken to compile all variables as comparable as possible. A description of all the variables used is included in the Data Appendix. Arguably other factors such as culture differences could also impact on the differences in the wage outcomes between China and Vietnam but are not included in the model specification as this information is not available in the datasets.[22]

3.3. Descriptive comparison

Fig. 1 shows the wage density estimated from the kernel estimator. In 2002, at any particular wage level except for the bottom, for both males and females the proportion of workers falling below that level was higher among Vietnamese workers than among Chinese workers, implying that the average wages in China is higher than that in Vietnam.

Table 1 presents the summary statistics of the samples. As implied in Fig. 1, on average the Chinese urban workers earned a higher wage than their Vietnamese counterparts. For both males and females the difference is about 0.25 log-points.[23] In terms of human capital, urban Vietnamese workers had slightly lower years of education than their Chinese counterparts.[24] In addition, Vietnamese workers generally had less potential experience. Therefore, Vietnamese workers were younger than their Chinese counterparts.

A closer examination reveals that more female workers had less than 10 years of experience in Vietnam than in China (24.23% versus 18.91%). More importantly, this gap was wider for females between the two countries than for males. For the workers with over 20 years of experience, the situation reverses with more Chinese than Vietnamese falling into this category and a wider gap for males (females: 42.61% in Vietnam versus 46.67% in China; males: 58.22% and 65.86% respectively). More supply of female workers with less experience in Vietnam relative to China (and relative to males) would potentially lower the returns to their experience more than their Chinese female (and male) counterparts.

In 2002, more Chinese resided in regions below the average household income than Vietnamese. The manufacturing industry accounted for a higher employment share for Chinese men than Vietnamese men but the reverse held for females. Vietnam was more of an agrarian economy than China, with more urban wage earners engaged in agriculture and mining activities. More Vietnamese urban wage earners participated in construction but fewer were involved in government and party administration.

In terms of employment distribution of ownership, the employment share of public sector (state sector and collectives) was larger for China than for Vietnam, while the employment share of the private sector was higher for Vietnam than for China.[25] More men than women worked in the state sector in China but not so in Vietnam.

[21] Following previous studies on Vietnam (for example, Liu, 2008; Dollar et al., 1998), we use average household expenditures instead of average household income in the empirical work.

[22] Nonetheless, both countries share underlying cultural beliefs and traditions that are based on Confucianism. Depending on how strongly these other factors are correlated with the explanatory variables, their impact could be partially captured by the wage structure effect in the decomposition presented later in the paper.

[23] That is, the Chinese urban workers earn about 28 percent (i.e. exp(0.25)) higher than the Vietnamese urban workers.

[24] Including rural areas will lower the average years of education for China. Rural areas have a lower education level than urban areas in China.

[25] Aside from the fact that migrants are excluded from the sample, private sector employment in China may be understated as 8.9% of individuals whose ownership status could not be determined in CHIP02 (Appleton et al., 2005).

Table 1
Summary statistics, China and Vietnam.

	China		Vietnam	
	Males	Females	Males	Females
Ln hourly wages (in PPP)	0.18	−0.01	−0.06	−0.26
Human capital				
Potential experience (years)	24.24	21.57	19.29	17.95
Potential experience square	693.25	539.25	468.83	422.83
Years of education	11.59	11.49	10.83	11.16
Industry (percent)				
Manufacturing	0.28	0.26	0.24	0.31
Agriculture and mining	0.05	0.03	0.09	0.06
Construction	0.04	0.02	0.19	0.04
Transport and communication	0.10	0.05	0.09	0.03
Government administration and party	0.15	0.11	0.11	0.07
Finance	0.04	0.04	0.01	0.02
Culture activities	0.15	0.20	0.08	0.22
Services	0.06	0.12	0.03	0.06
Wholesales and retails	0.08	0.13	0.12	0.15
Electricity	0.04	0.03	0.02	0.01
Other industries	0.02	0.02	0.02	0.02
Ownership (percent)				
State	0.74	0.69	0.46	0.56
Collective	0.06	0.10	0.02	0.01
Private firms	0.18	0.19	0.49	0.37
Foreign firms	0.03	0.02	0.03	0.06
Others (percent)				
Marital status	0.89	0.87	0.70	0.66
Regions with below average income	0.73	0.71	0.46	0.43
No. of observations	5033	3877	4053	2843

Note: For China, the distribution of wages is more dispersed. It is well-documented that the reform has been focused on the coastal areas. Hence, only a small proportion of the population in the coastal regions enjoys very high wages but the majority of the population residing in in-land regions has lower wages than the average. Hence, on average, the wages of China is higher despite more Chinese living in the not-so-rich regions.

4. Methodology

In addition to looking at the mean of the wages, we examine the wage differentials between China and Vietnam over the entire wage distribution.

4.1. The DFL decomposition

DiNardo et al. (1996) propose a semi-parametric method to decompose the gap between two distributions into a component attributable to observed characteristics and another component that cannot be explained by observed characteristics. In the context of wage distributions, the unexplained component is often regarded as the effect of differences in wage structure (i.e. returns to wage covariates).[26] Firpo et al. (2007) and Fortin et al. (2010) label the first component as the 'composition effect', and the second as the 'wage structure effect'. We use these terminologies in the rest of this paper.

The DFL decomposition is essentially a reweighting procedure, through which a counterfactual distribution can be constructed. To illustrate, assume that each observation in a pooled sample of two groups is drawn from the joint distribution $f(w;X;g)$, where w represents the wage rate, X is a row vector of wage covariates (e.g. education level, experience, etc.), and g is a group indicator (e.g. 0 for the Vietnamese workers and 1 for the Chinese workers). Conditional on g, we can write the joint distribution of wages and covariates as $f(w,X|g)$. This implies that the distribution of the wages of group 0 $f^0(w)$ is defined as the integral of the conditional density of wages over the domain of wage covariates Ω_X[27]:

$$f^0(w) = \int_{X\in\Omega_X} f(w,X|g=0)dX = \int_{X\in\Omega_X} f(w|X,g=0)f_X(X|g=0)dX. \quad (1)$$

[26] The DFL method has been widely used in applied labour economics to examine total wage or wealth gaps between males and females (e.g. Barón and Cobb-Clark, 2008; Sierminska et al., 2010), between union and non-union workers (e.g. Bell and Pitt, 1998; Chen, 2010), and between immigrants and native born workers (e.g. Butcher and Dinardo, 2002).

[27] In theory and practice, the method is not restricted to dummy variables. For instance, Fortin et al. (2010) use two continuous explanatory variables such as 'years worked civilian' and 'years worked military' to capture life time work experience to model wage outcomes.

where $f(w|.)$ is the conditional distribution of wages, and $f_x(X|.)$ is the conditional joint distribution of wage covariates. The density of wages of group 1 $f^1(w)$ is defined similarly.

From group 0, a counterfactual distribution of wages $f^C(w)$ can be constructed by letting group 0 to assume the distribution of characteristics of group 1, but keep their own conditional distribution of wages. That is,

$$f^C(w) = \int_{X\in\Omega_X} f(w|X,g=0) f_X(X|g=1)dX = \int_{X\in\Omega_X} \varphi_X f(w|X,g=0) f_X(X|g=0)dX, \tag{2}$$

where $\varphi_X = f_X(X|g=1)/f_X(X|g=0)$. This demonstrates that the counterfactual distribution can be obtained through reweighting. Using Bay's rule, the reweighting factor can be calculated as

$$\varphi_s = P(g=1|X)P(g=0)[P(g=0|X)P(g=1)]^{-1}, \tag{3}$$

where $P(g=1|X)$ can be computed from a logit or probit regression on the pooled sample.

The difference between $f^1(w)$ and $f^C(w)$ is the wage structural effect, while the difference between $f^C(w)$ and $f^0(w)$ is the composition effect. Distributional statistics, such as the mean, variance and various quantiles, can be computed from the original and counterfactual distributions and the differences of the distributional statistics can be decomposed accordingly.

In practice the DFL decomposition can be implemented as follows (Fortin et al., 2010):

(a) Pool the data from both groups 0 and 1 and run a logit or probit model for the probability of belonging to group 1.
(b) Estimate the reweighting factor for observations in group 0, using the predicted probability of belonging to group 1 ($\widehat{P}(g=1|X)$) and group 0 ($\widehat{P}(g=0|X)$), as well as the sample proportions in group 1 ($\widehat{P}(g=1)$) and group 0 ($\widehat{P}(g=0)$):

$$\hat{\varphi}(X) = \frac{\widehat{P}(g=1|X)\times\widehat{P}(g=0)}{\widehat{P}(g=0|X)\times\widehat{P}(g=1)}$$

(c) Compute the counterfactual statistics of interest using the observations from group 0 reweighted using $\hat{\varphi}(X)$.

4.2. Unconditional quantile regression and decomposition

To further identify the effects of a particular variable or a particular group of variables on the aggregate wage structural effect and the composition effect we apply the unconditional quantile regression (UQR) methods (Firpo et al., 2007; Fortin et al., 2010).[28] As suggested by its name, this regression method enables estimating the effect of each observed variable on the unconditional quantile of a distribution. Central to UQR is the re-centred influence function (RIF) of a statistics, such as quantile. The RIF of quantile q_τ, for an outcome variable w is

$$RIF(w;q_\tau) = q_\tau + \frac{\tau - I(w\leqslant q_\tau)}{f_w(q_\tau)}, \tag{4}$$

where $I(.)$ is an indicator function equal to one if the condition in the parenthesis is true and zero otherwise; $f_w(q_\tau)$ is the wage density at q_τ. Firpo et al. (2007) and Fortin et al. (2010) show that when the RIF is approximated by a linear function in the covariates,

$$E[\mathrm{RIF}(w;q_\tau)|X] = X\beta, \tag{5}$$

where β is a column vector of coefficients, the coefficient β_j on the variable x_j represents the partial effect of the variable on that quantile.

To run UQR, we first need to estimate the RIF for each observation of the samples. For sample g ($g=0,1,C$), where C is the reweighted sample, the RIF for a particular quantile q_τ is first estimated by computing the sample quantile $\widehat{q_\tau}$ and estimating the density at that point ($\hat{f}_w(\widehat{q_\tau})$) using kernel methods. An estimate of the RIF of each observation is then obtained by plugging in these estimates into Eq. (4).

Combined with the DFL reweighting procedure, UQR can be used to decompose the effect of a variable on the gap at a quantile of the two wage distributions into two components in a way similar to the Oaxaca and Blinder decomposition for OLS regressions. The two components are the component attributable to the difference in the variable (i.e. the composition effect) and the component attributable to the difference in the return to the variable (i.e. the wage structure effect). In practice, for decomposition purposes, we first run UQR on groups 1 (the Chinese workers) and 0 (the Vietnamese workers) and the reweighted sample C (i.e. reweighted Vietnamese workers) to obtain

$$\widehat{RIF}(w_g;\hat{q}_\tau) = X_g\hat{\beta}_g, \quad g=0,1,C. \tag{6}$$

Using the parameter estimates, we decompose the wage gap between the two countries at quantile q_τ as

[28] There are other decomposition methods that also allow detailed decomposition of the wage structure effect and the composition effect, such as those based on the DFL method and conditional quantile regressions, but the alternative methods either suffer the path-dependence problem or are more difficult to implement than the one used in this paper (Fortin et al., 2010).

$$q_\tau(w_1) - q_\tau(w_0) = \left[\overline{X}_1\left(\hat{\beta}_1 - \hat{\beta}_C\right) + \widehat{R}^S_\tau\right] + \left[(\overline{X}_1\hat{\beta}_C - \overline{X}_0\hat{\beta}_0) + \widehat{R}^C_\tau\right]$$
$$= \left[\sum_{j=1}^{J}\bar{x}_{1j}\left(\hat{\beta}_{1j} - \hat{\beta}_{Cj}\right) + \widehat{R}^S_\tau\right] + \left[\left(\sum_{j=1}^{J}\bar{x}_{1j}\hat{\beta}_{Cj} - \sum_{j=1}^{J}\bar{x}_{0j}\hat{\beta}_{0j}\right) + \widehat{R}^C_\tau\right]. \quad (7)$$

where $\overline{X}_g$ ($g = 0, 1$) is the row vector of the means of the wage covariates for group g. The first term on the right-hand side represents the wage structure effect (i.e. the wage gap due to differences in the returns to the covariates) and the second term the composition effect (i.e. the wage gap due to differences in the covariates). $\widehat{R}^S$ and $\widehat{R}^c$ are the estimates of the approximation errors corresponding to the wage structure and composition effects respectively. The approximation errors are due to the linear specification assumed by the RIF regression functions. $\widehat{R}^S$ ($\widehat{R}^c$) is calculated as the difference between the wage structure effect (the composition effect) estimated from the DFL method and $\overline{X}_1(\hat{\beta}_1 - \hat{\beta}_C)(\overline{X}_1\hat{\beta}_C - \overline{X}_0\hat{\beta}_0)$. The second line of Eq. (6) demonstrates that both the wage structural effect and the composition effect can be further decomposed into the contribution of each wage covariate or into different groups of the covariates. To facilitate inferences we bootstrap the standard errors of the decomposition results.

5. Empirical results

5.1. Wage determination results

Tables 2a and 2b report the OLS and UQR regression results. At the mean the returns to education are higher in urban China than in urban Vietnam for both males and females in 2002. For example, the results show that one additional year of education raises wages by 6.5% and 7.6% respectively for the Chinese male and female workers; the corresponding effects for the Vietnamese workers are 6.3% and 6.4%. Note that only for females the difference in the return to education is statistically significant.

For the Chinese, the return to education appears to decrease when we move up along the wage distribution (except at the 10th quantile for women), but the opposite is true for Vietnamese (except at the 90th quantile for men). As a result, while urban Chinese workers have an advantage over their Vietnamese counterparts in the return to education at the lower part of the wage distribution, this advantage at the lower part of the wage distribution reverses to disadvantage at the upper part. The declining returns to education when moving up the wage distribution in urban China are well-documented (Bishop et al., 2005; Knight and Song, 2003).[29] The returns to education are more (less) compressed in urban China than in urban Vietnam for females (males) in absolute term. For example, the difference of the returns between the 10th and 90th quantiles in absolute value is 0.016 and 0.010 for the Chinese male and female workers respectively, but the corresponding numbers for Vietnamese are 0.025 and 0.050.

How do we reconcile these different results obtained from OLS and UQR? The relative expansion of higher education in the two countries may hold the key behind the observed differences in education composition between the two countries. At the mean, higher returns to education in China relative to Vietnam indicate, on average, demand for education relative to supply in China is higher than that in Vietnam. The quantile regression results reveal variations of the returns to education across the entire wage distribution, indicating that demand relative to supply forces impact different parts of the wage distribution differently. More specifically, the supply of skilled workers in Vietnam with tertiary and upper secondary qualifications is still very low relative to that of China. As shown in Table 3, for instance, only about 21 (over 32) percent of Vietnamese (Chinese) male urban wage earners have tertiary and above education. Yet, the corresponding figure for primary and below is about 25% in Vietnam in comparison to less than 3% in China. The relatively scarce (abundant) skilled labour (low or unskilled labour) in Vietnam would potentially put more upward (downward) pressure on the skill premium at the top (bottom) end of its wage distribution in comparison to that of China.

An inverse-U shaped relationship between wages and labour market experience is evident for both China and Vietnam. Similar to many market economies, the earnings-experience profile peaks at mid-30s to mid-40s, indicating that wages in China and Vietnam are associated with workers' productivity. The earnings-experience profile peaks later for the Chinese men than for the Vietnamese men. Vietnamese men are generally paid more for their experience than Chinese men except at the very low end and very top end of the wage distribution. On the contrary, the consistently lower returns for Vietnamese females than their Chinese counterparts at the mean and throughout the entire distribution gives rise to a flatter and less concave earnings experience profile. Notably, the profile of Vietnamese female workers declines much more gradually relative to that of the Chinese women after it peaks.

We speculate that the more concave profile of the Chinese workers may possibly relate to the deeper SOEs reform in China in the mid-1990s. Firstly, with the more significant retrenchments that occurred in China in the late 1990s, senior/older Chinese workers were more likely to lose their wage bargaining power relative to their Vietnamese counterparts as they were the most at risk from retrenchment (Appleton et al., 2005).[30] Secondly, findings from previous studies on SOE reforms

[29] One possible explanation is related to the unobserved employer characteristics such as ability to pay (Knight and Song, 2003). They argue that state directive to raise the basic wage has led many enterprises, especially the more profitable ones, to incorporate some of the bonus into the basic wage. As the bonus attracts no returns to education and tends to distribute more equally within the enterprises, it translates into lower returns to education and age for profitable firms, which are more likely at the top of the wage distribution.

[30] Seniority was the central feature of the pre-reform wage structure. As experience was over-rewarded prior to the reform, experienced state employees were more at risk of redundancy.

Table 2a
Unconditional quantile and OLS regressions, males.

	China (observations: 5033)						Vietnam (observations: 4053)					
	10%	25%	50%	75%	90%	Mean	10%	25%	50%	75%	90%	Mean
Years of education	0.0764***	0.0732***	0.0587***	0.0555***	0.0599***	0.0651***	0.0413***	0.0474***	0.0668***	0.0762***	0.0663***	0.0634***
	(0.00785)	(0.00506)	(0.00390)	(0.00417)	(0.00550)	(0.00344)	(0.00511)	(0.00395)	(0.00364)	(0.00450)	(0.00619)	(0.00313)
Potential experience/5	0.229***	0.175***	0.133***	0.103***	0.146***	0.143***	0.220***	0.227***	0.206***	0.142***	0.127***	0.179***
	(0.0475)	(0.0307)	(0.0236)	(0.0253)	(0.0333)	(0.0209)	(0.0322)	(0.0250)	(0.0230)	(0.0284)	(0.0391)	(0.0198)
Experience square/25	−0.0172***	−0.0110***	−0.00746***	−0.00400	−0.00934***	−0.00853***	−0.0223***	−0.0210***	−0.0173***	−0.00884***	−0.00864**	−0.0151***
	(0.00464)	(0.00300)	(0.00231)	(0.00247)	(0.00325)	(0.00204)	(0.00351)	(0.00272)	(0.00251)	(0.00309)	(0.00426)	(0.00215)
Collective	−0.581***	−0.465***	−0.299***	−0.171***	−0.132**	−0.316***	0.0351	0.152	0.276***	−0.143	−0.203	0.0105
	(0.0821)	(0.0530)	(0.0408)	(0.0436)	(0.0575)	(0.0360)	(0.126)	(0.0971)	(0.0895)	(0.111)	(0.152)	(0.0770)
Private	−0.547***	−0.397***	−0.201***	−0.0642**	−0.0188	−0.270***	0.0151	−0.136***	−0.114***	−0.0953**	−0.178***	−0.0828***
	(0.0540)	(0.0348)	(0.0268)	(0.0287)	(0.0378)	(0.0237)	(0.0426)	(0.0330)	(0.0304)	(0.0375)	(0.0516)	(0.0261)
Foreign	0.153	0.192**	0.199***	0.275***	0.397***	0.217***	0.280***	0.291***	0.338***	0.146*	0.258**	0.327***
	(0.123)	(0.0793)	(0.0610)	(0.0653)	(0.0861)	(0.0539)	(0.0906)	(0.0701)	(0.0646)	(0.0798)	(0.110)	(0.0556)
Agriculture and mining	0.0614	0.155**	0.0625	0.0203	0.0955	0.0843**	−0.0597	−0.0337	0.0935**	0.176***	0.126*	0.0604
	(0.0953)	(0.0615)	(0.0473)	(0.0507)	(0.0668)	(0.0418)	(0.0614)	(0.0475)	(0.0438)	(0.0541)	(0.0744)	(0.0377)
Construction	−0.178*	0.0150	0.0910*	0.0474	0.0844	0.0194	0.000885	−0.0198	−0.00771	−0.00594	0.109*	−0.00881
	(0.0975)	(0.0629)	(0.0484)	(0.0518)	(0.0683)	(0.0428)	(0.0488)	(0.0378)	(0.0348)	(0.0430)	(0.0592)	(0.0299)
Transport and communication	−0.0102	0.154***	0.233***	0.166***	0.104**	0.133***	0.0216	0.109**	0.279***	0.294***	0.299***	0.185***
	(0.0688)	(0.0444)	(0.0342)	(0.0366)	(0.0482)	(0.0302)	(0.0598)	(0.0463)	(0.0427)	(0.0527)	(0.0725)	(0.0367)
Government admin and party	0.0470	0.260***	0.328***	0.245***	0.120***	0.200***	−0.220***	−0.136***	−0.0396	−0.225***	−0.398***	−0.229***
	(0.0643)	(0.0415)	(0.0319)	(0.0342)	(0.0451)	(0.0282)	(0.0608)	(0.0471)	(0.0434)	(0.0536)	(0.0738)	(0.0373)
Finance	0.0946	0.357***	0.358***	0.324***	0.241***	0.266***	0.0204	−0.0296	0.134	0.361***	0.158	0.0668
	(0.101)	(0.0653)	(0.0503)	(0.0538)	(0.0709)	(0.0444)	(0.135)	(0.105)	(0.0966)	(0.119)	(0.164)	(0.0830)
Culture activities	0.0514	0.256***	0.355***	0.428***	0.361***	0.286***	−0.0929	−0.111**	−0.0383	0.00753	0.0130	−0.0677*
	(0.0635)	(0.0410)	(0.0315)	(0.0338)	(0.0445)	(0.0279)	(0.0670)	(0.0518)	(0.0478)	(0.0590)	(0.0812)	(0.0411)
Services	−0.269***	0.00216	−0.00193	0.0339	0.0165	−0.0505	−0.620***	−0.172**	−0.157**	0.0671	0.0601	−0.136**
	(0.0835)	(0.0539)	(0.0415)	(0.0444)	(0.0585)	(0.0367)	(0.0960)	(0.0743)	(0.0685)	(0.0846)	(0.116)	(0.0589)
Wholesales and retails	−0.607***	−0.231***	−0.103***	0.0122	0.0270	−0.205***	−0.0740	0.0472	0.0991**	0.220***	0.0572	0.0277
	(0.0761)	(0.0491)	(0.0378)	(0.0404)	(0.0533)	(0.0334)	(0.0553)	(0.0428)	(0.0395)	(0.0488)	(0.0671)	(0.0339)
Electricity	0.122	0.278***	0.350***	0.387***	0.453***	0.311***	0.174	0.156*	0.159*	0.275***	−0.203	0.0837
	(0.100)	(0.0646)	(0.0497)	(0.0532)	(0.0701)	(0.0439)	(0.116)	(0.0899)	(0.0829)	(0.102)	(0.141)	(0.0712)
Other industries	−0.134	0.178*	0.122	0.126	0.0896	0.0414	−0.134	−0.139*	0.00606	−0.0470	−0.156	−0.0904
	(0.154)	(0.0996)	(0.0766)	(0.0820)	(0.108)	(0.0677)	(0.104)	(0.0808)	(0.0745)	(0.0920)	(0.127)	(0.0641)
Married	0.246***	0.179***	0.0963**	0.0727	0.0602	0.155***	0.133***	0.0257	−0.00914	−0.00189	0.0180	0.0294
	(0.0837)	(0.0540)	(0.0416)	(0.0445)	(0.0587)	(0.0368)	(0.0445)	(0.0344)	(0.0317)	(0.0392)	(0.0539)	(0.0273)
Below average region	−0.299***	−0.314***	−0.324***	−0.440***	−0.587***	−0.391***	−0.204***	−0.261***	−0.301***	−0.351***	−0.394***	−0.302***
	(0.0426)	(0.0275)	(0.0212)	(0.0226)	(0.0298)	(0.0187)	(0.0319)	(0.0247)	(0.0228)	(0.0281)	(0.0387)	(0.0196)
Constant	−1.991***	−1.549***	−0.841***	−0.309***	0.0635	−0.921***	−1.702***	−1.322***	−1.149***	−0.721***	−0.0153	−0.994***
	(0.146)	(0.0945)	(0.0727)	(0.0778)	(0.103)	(0.0643)	(0.0985)	(0.0762)	(0.0703)	(0.0868)	(0.119)	(0.0604)

Note: (1) The reference group for ownership is the state sector; for industry it is manufacturing industry. (2) Standard errors are in parentheses. They are bootstrapped with 500 replications and account for the complex sampling of the Vietnamese data.

* Level of significance of 1%.

** Level of significance of 5%.

*** Level of significance of 10%.

Table 2b
Unconditional quantile and OLS regressions, females.

	China (observations: 3877)						Vietnam (observations: 2843)					
	10%	25%	50%	75%	90%	Mean	10%	25%	50%	75%	90%	Mean
Years of education	0.0756***	0.0896***	0.0867***	0.0686***	0.0661***	0.0758***	0.0502***	0.0543***	0.0621***	0.0640***	0.101***	0.0644***
	(0.00914)	(0.00664)	(0.00567)	(0.00527)	(0.00739)	(0.00448)	(0.00616)	(0.00530)	(0.00446)	(0.00520)	(0.00945)	(0.00409)
Potential experience/5	0.219***	0.263***	0.268***	0.168***	0.196***	0.236***	0.111***	0.111***	0.169***	0.137***	0.131***	0.113***
	(0.0510)	(0.0370)	(0.0317)	(0.0294)	(0.0412)	(0.0250)	(0.0312)	(0.0268)	(0.0226)	(0.0263)	(0.0478)	(0.0207)
Experience square/25	−0.0197***	−0.0228***	−0.0224***	−0.0128***	−0.0161***	−0.0207***	−0.0109***	−0.0089***	−0.0142***	−0.0099***	−0.00829	−0.0088***
	(0.00570)	(0.00414)	(0.00354)	(0.00329)	(0.00461)	(0.00279)	(0.00374)	(0.00322)	(0.00271)	(0.00316)	(0.00574)	(0.00248)
Collective	−0.201***	−0.399***	−0.317***	−0.149***	−0.118**	−0.262***	0.265*	0.295**	−0.145	−0.129	−0.299	0.0115
	(0.0723)	(0.0525)	(0.0449)	(0.0417)	(0.0584)	(0.0354)	(0.145)	(0.125)	(0.105)	(0.123)	(0.223)	(0.0964)
Private	−0.490***	−0.362***	−0.271***	−0.132***	−0.0725	−0.304***	−0.208***	−0.269***	−0.168***	−0.0490	−0.0305	−0.138***
	(0.0585)	(0.0425)	(0.0363)	(0.0337)	(0.0473)	(0.0287)	(0.0480)	(0.0413)	(0.0348)	(0.0406)	(0.0737)	(0.0319)
Foreign	−0.0430	0.0558	0.0548	0.103	0.0777	0.0247	0.127*	0.234***	0.144***	0.0565	0.294**	0.188***
	(0.141)	(0.103)	(0.0877)	(0.0814)	(0.114)	(0.0692)	(0.0770)	(0.0662)	(0.0558)	(0.0651)	(0.118)	(0.0512)
Agriculture and mining	0.111	0.146*	0.181**	0.111	0.0685	0.118**	0.141*	−0.136**	0.0984*	0.0714	0.181	0.0712
	(0.122)	(0.0886)	(0.0758)	(0.0704)	(0.0987)	(0.0598)	(0.0781)	(0.0672)	(0.0566)	(0.0660)	(0.120)	(0.0519)
Construction	−0.0425	0.0878	0.0200	0.102	0.273**	0.0661	−0.107	−0.250***	−0.0607	−0.0240	0.0650	−0.0855
	(0.139)	(0.101)	(0.0862)	(0.0800)	(0.112)	(0.0680)	(0.0897)	(0.0772)	(0.0650)	(0.0758)	(0.138)	(0.0596)
Transport and communication	0.0444	0.144**	0.183***	0.0997*	0.0496	0.111**	0.149	0.257***	0.381***	0.581***	0.381**	0.336***
	(0.0972)	(0.0705)	(0.0603)	(0.0560)	(0.0785)	(0.0476)	(0.0994)	(0.0855)	(0.0720)	(0.0840)	(0.153)	(0.0660)
Government admin and party	0.0272	0.150***	0.311***	0.219***	0.141**	0.177***	−0.138*	−0.0689	0.0521	−0.153**	−0.172	−0.0728
	(0.0791)	(0.0574)	(0.0491)	(0.0456)	(0.0639)	(0.0388)	(0.0743)	(0.0639)	(0.0538)	(0.0628)	(0.114)	(0.0494)
Finance	0.0604	0.0854	0.240***	0.164***	0.330***	0.151***	−0.103	0.120	0.280***	0.352***	0.465**	0.236***
	(0.107)	(0.0776)	(0.0664)	(0.0616)	(0.0864)	(0.0524)	(0.123)	(0.106)	(0.0891)	(0.104)	(0.189)	(0.0817)
Culture activities	−0.0205	0.171***	0.410***	0.397***	0.320***	0.266***	0.000120	0.0775	0.131***	0.0768	0.123	0.0938**
	(0.0661)	(0.0479)	(0.0410)	(0.0381)	(0.0534)	(0.0324)	(0.0559)	(0.0481)	(0.0405)	(0.0472)	(0.0857)	(0.0371)
Services	−0.336***	−0.361***	−0.203***	−0.101**	−0.0470	−0.223***	−0.408***	−0.284***	−0.0434	0.0575	0.0833	−0.127**
	(0.0720)	(0.0523)	(0.0447)	(0.0415)	(0.0582)	(0.0353)	(0.0794)	(0.0683)	(0.0575)	(0.0671)	(0.122)	(0.0527)
Wholesales and retails	−0.491***	−0.290***	−0.148***	−0.0421	0.0500	−0.202***	0.0212	0.0417	0.144***	0.124***	0.149*	0.0781**
	(0.0703)	(0.0511)	(0.0437)	(0.0405)	(0.0568)	(0.0345)	(0.0538)	(0.0463)	(0.0390)	(0.0455)	(0.0826)	(0.0358)
Electricity	0.236*	0.384***	0.482***	0.350***	0.221**	0.326***	0.159	0.336*	−0.0554	0.151	−0.346	0.0146
	(0.125)	(0.0905)	(0.0774)	(0.0718)	(0.101)	(0.0611)	(0.236)	(0.203)	(0.171)	(0.200)	(0.363)	(0.157)
Other industries	−0.0953	−0.0916	−0.0600	−0.105	−0.162	−0.152**	0.0627	0.109	0.301***	−0.0682	−0.0319	0.140
	(0.158)	(0.115)	(0.0981)	(0.0911)	(0.128)	(0.0774)	(0.131)	(0.113)	(0.0951)*	(0.111)	(0.201)	(0.0872)
Married	−0.0158	−0.0516	−0.0153	0.0148	−0.0127	−0.0110	−0.0307	−0.00377	−0.0474	−0.0465	0.0646	0.0132
	(0.0786)	(0.0570)	(0.0488)	(0.0453)	(0.0635)	(0.0385)	(0.0396)	(0.0340)	(0.0287)	(0.0334)	(0.0607)	(0.0263)
Below average region	−0.276***	−0.303***	−0.374***	−0.440***	−0.662***	−0.421***	−0.119***	−0.207***	−0.244***	−0.256***	−0.347***	−0.250***
	(0.0454)	(0.0330)	(0.0282)	(0.0262)	(0.0367)	(0.0223)	(0.0360)	(0.0310)	(0.0261)	(0.0304)	(0.0552)	(0.0239)
Constant	−1.895***	−1.747***	−1.362***	−0.523***	0.00144	−1.086***	−1.671***	−1.392***	−1.235***	−0.850***	−0.887***	−1.140***
	(0.164)	(0.119)	(0.102)	(0.0944)	(0.132)	(0.0802)	(0.106)	(0.0908)	(0.0764)	(0.0892)	(0.162)	(0.0701)

Note: (1) The reference group for ownership is the state sector; for industry it is manufacturing industry. (2) Standard errors are in parentheses. They are bootstrapped with 500 replications and account for the complex sampling of the Vietnamese data.

* Level of significance of 1%.

** Level of significance of 5%.

*** Level of significance of 10%.

Table 3
Education distribution by country and gender (percent).

	China		Vietnam	
	Males	Females	Males	Females
Below primary	0.15	0.12	7.99	7.67
Primary	2.17	2.45	17.54	14.39
Lower secondary	20.31	23.73	21.37	18.96
Upper secondary	29.81	26.19	15.32	16.78
Vocational	15.44	10.70	16.90	21.49
Tertiary	32.11	36.81	20.87	20.72

in China and Vietnam (for instance, Appleton et al., 2005; Bulger (2000), Clarke (2004)) suggest that females are associated with greater risk of redundancy. Thirdly, more Chinese female workers in the state sector than their Vietnamese counterparts (Table 1). All these factors could have given rise to a more concave earning experience profile for women in particular in China than in Vietnam. Alternatively, as discussed earlier, the fact that Vietnam's (export) industries are more labour intensive and less technically sophisticated would also have adversely affected the returns to experience for females in Vietnam relative to females in China.

Notably, on returns to industry, the Chinese working in government and party organizations have a relative wage advantage. On the contrary, their counterparts in Vietnam are disadvantaged. For example, the estimates at the mean show that in China, male (female) workers in government and party organizations earn 20% (18%) more than their respectively counterparts in manufacturing. However, in Vietnam, male and female workers in government and party organizations earn 23% and 7% less respectively than their counterparts in manufacturing. The relatively larger wage premia attached to the Chinese who work for the administration and party may indicate greater degree of segmentation across different types of ownership relative to those in Vietnam. We will return to this point later.

The wage gap between state and private owned enterprises is much larger in China than in Vietnam, both at the mean and throughout the wage distribution. For example, at the mean male Chinese workers in private firms earn 27% less than their counterparts in the SOEs, but in Vietnam the penalty for male private sector employees is only 8%. This segmentation in terms of the relative wage advantage of employees in the state sector over the other types of ownership except foreign firms is well-documented in China (Knight and Song, 2003; Li and Bai, 2005). They suggest that the SOEs, especially the profitable ones, may enjoy increased autonomy to pay workers extra wage income in the forms of bonus and subsidy. It may also partly relate to the active policies that were launched at the end of the 1990s (in the aftermath of massive retrenchment) to raise public sector wages in order to retain skilled workers. Generally male workers in foreign owned enterprises earn more than those males working in state-owned enterprises at the mean and along most part of the wage distribution, with a larger earnings premium observed in Vietnam (China) in the lower (upper) half of the wage distribution.

The estimated coefficients on the region dummy indicate that China has a much larger wage differentials between richer and not so rich regions than Vietnam, highlighting the geographic inequality is higher in China.

Together with the descriptive analyses earlier, the results show that the Chinese and Vietnamese urban workers not only have different productivity characteristics, the returns to the characteristics also differ between the two countries. In the next section, we further analyse the respective contributions of the productivity characteristics and the return to the characteristics to the wage differentials between the two countries.

5.2. DFL decomposition results

The DFL decomposition of wage gap at various quantiles is shown in Fig. 2, which reports the results at each 0.01 quantile, and also in Table 4, which includes selected quantiles and the decomposition at the mean for the ease of reading. The raw gap at different quantiles and at the mean and the bootstrapped standard errors of the decomposition results are also reported in Table 4.

A positive raw wage gap throughout almost the entire wage distribution for men and women alike indicates that the Chinese wage earners enjoy higher wages than their respective Vietnamese counterparts. At the mean the gap is about 0.25 in log wages for both males and females. Clearly, the gap is not uniform across the wage distribution and the pattern differs between men and women. For males the largest wage gap occurs around the median, while for females it happens at about the 75th quantile.

At the mean, as well as most parts of the wage distribution (except for the two ends of the wage distribution), both the wage structure and composition effects are positive for men and women alike; and overall the wage structure effects appear to explain more of the China–Vietnam wage differentials than the composition effects. For men, at the mean, the wage structure effects of 0.21 explain 90% of the raw wage gap of 0.23; for women, the wage structure effects of 0.22 explain 86% of the raw wage gap of 0.25. For men, at the two ends of the wage distribution, the wage structure effects appear to be larger than the raw wage gap, with the composition effects working to narrow the wage gap; in the middle range of the wage distribution, the wage structure effects still explain 77–85% of the raw wage gap.

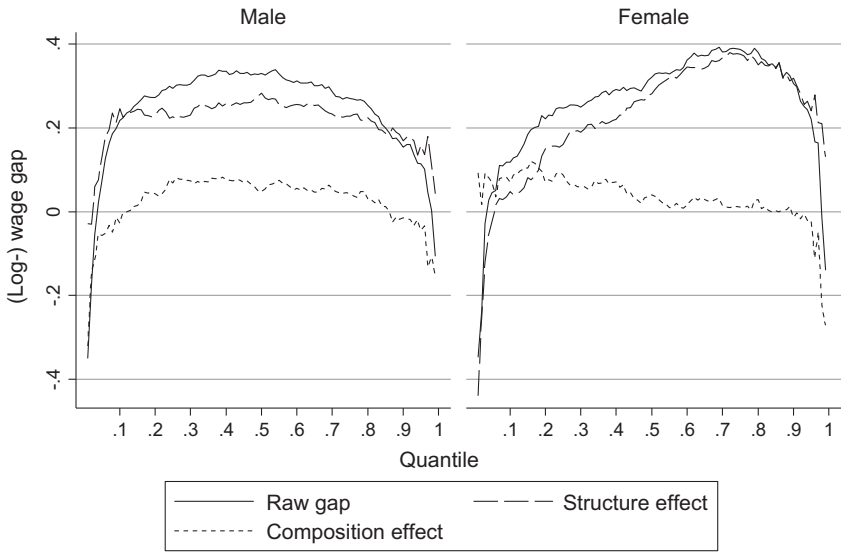

Fig. 2. DFL decomposition of China–Vietnam wage gap.

Table 4
DFL decomposition of the wage gap between China and Vietnam, by gender.

	Raw gap		Wage structure effect		Composition effect	
	Gap	s.e.[a]	Gap	s.e.	Gap	s.e.
Men						
Mean	0.2339	0.0062	0.211	0.0039	0.023	0.0054
			90.2%[b]		*9.8%*	
0.1	0.2181	0.0051	0.2454	0.0046	−0.0273	0.0056
			112.5%		*−12.5%*	
0.25	0.2951	0.0052	0.2265	0.0043	0.0686	0.0049
			76.8%		*23.2%*	
0.5	0.3305	0.0059	0.2823	0.0038	0.0482	0.0053
			85.4%		*14.6%*	
0.75	0.2706	0.0072	0.2283	0.0045	0.0423	0.0061
			84.4%		*15.6%*	
0.9	0.1541	0.0088	0.1692	0.0063	−0.0151	0.0067
			109.8%		*−9.8%*	
Women						
Mean	0.2528	0.0068	0.2173	0.0052	0.0356	0.004
			86.0%		*14.1%*	
0.1	0.1186	0.0043	0.0475	0.0043	0.0711	0.0037
			40.1%		*59.9%*	
0.25	0.2477	0.006	0.16	0.0052	0.0878	0.0042
			64.6%		*35.4%*	
0.5	0.3218	0.0067	0.2815	0.0051	0.0403	0.0037
			87.5%		*12.5%*	
0.75	0.3873	0.0071	0.3765	0.005	0.0109	0.0045
			97.2%		*2.8%*	
0.9	0.3055	0.0103	0.3192	0.0077	−0.0137	0.0067
			104.5%		*−4.5%*	

Note:
[a] Standard errors are bootstrapped with 500 replications. The complex sampling of the Vietnamese data is accounted for in the bootstrapping.
[b] The figures in percentage refer to the proportion of total wage gap explained by the wage structure effects or the composition effects.

For women, at the lower end of the wage distribution (i.e. below the 20th quantile), the composition effects appear to dominate the wage structure effects. For example, at the 10th quantile, the composition effects explain about 60% of the female raw wage gap. Moving up along the wage distribution, the wage structure effects increase while the composition effects decrease. At the upper end of the wage distribution the female raw wage gap is entirely explained by the wage structure effects. For example, at the 75th and 90th quantiles, the wage structure effects explain respectively 97% and 105% of the female raw wage gap. We will draw on the UQR decomposition results later to gain some insight into this difference between males and females.

In the context of inter-country comparison, these differences captured by the wage structure effect do not refer to discrimination as in the context of intra-country comparison. Just as the traditional Oaxaca–Blinder decomposition, the wage structure effect may include returns to unobservable skills and potentially measurement errors.[31] China and Vietnam have both experienced significant institutional changes. It is reasonable to expect that the differences in returns to the unobservables that reflect the differences in the institutional arrangements and that the reform process would affect the pace and depth of the changes in the wage determination system of the two countries. For instance, the regression results indicate higher returns to education (at the mean) for China. The higher returns to characteristics such as education could possibly reflect the higher returns to unobserved skills and/or higher demand for skilled workers as a result of the impact of a deeper reform process. After all, it is reasonable to assume that the observed and unobserved skills are highly correlated (Meng et al., 2013).

5.3. UQR decomposition results

Table 5 further decomposes the wage structure and the composition effects into the components contributed by different groups of wage covariates.

Earlier results show that for males, the wage structure effect contributes more than the composition effect to the China–Vietnam wage differentials. The wage structure effect is positive throughout the earnings distribution. At the mean and the major quantiles examined, the unexplained effects aside, for males, differential returns to industry matters across the entire earnings distribution. The differential returns to industry work in favour of the Chinese male workers. For instance, it contributes to 56% of the positive wage structure effect at the 10th quantile. At the 25th quantile, it accounts for 71% of the wage structure effect. On the other hand, the differences in returns to ownership and education help reduce the wage gap by favouring Vietnamese workers in most part of the earnings distribution (except at the 90th quantile).

The composition effect of the male wage differential, at the mean and most part of the wage distribution is positive (except for the 10th quantile and the 90th quantile), distributional differences in education appear to be the main contributor to the composition effect at the mean and at the part of the distribution between the 25th and 75th quantiles. The distributional difference in experience is also an important contributing factor at these parts of the earnings distribution.

For females, at the mean and most part of the wage distribution (except at the 10th quantile), the wage structure effect dominates the composition effect. The wage structure effect is positive throughout the entire wage distribution, contributing to the overall wage differential gap. For instance, at the mean and the 50th quantile the difference in returns to education and experience are the main contributors to the wage structure effect, explaining over 60% and more than the total wage structure effect respectively. At the upper end of the wage distribution, the wage structure effect is largely unexplained.

For most part of the wage distribution (i.e., except for the lower end), the contribution of the composition effects to the female total wage gap is small in magnitude. It is positive and contributes to the China–Vietnam wage gap except at the very top end. When the composition effect is further broken down, the relative roles of the wage covariates in contributing to the composition effect vary depending on the quantile examined. For example, at the 10th quantile the (positive) composition effect is largely driven by the distributional differences in education and the other factors, while at the 75th quantile, the (positive) composition effect is largely explained by the distributional differences in experience. At the mean and the 25th and 50th quantiles, the composition effect is largely unexplained.

The DFL results suggest that the wage structure effect at the low end of the female wage distribution is dominated by the composition effect but this is not the case for males. The UQR decomposition results reveals that, for females, at the 10th quantile, the positive wage structure effect is offset by the differential return to other factors which is large in magnitude and negative in sign. A closer examination of the UQR reveals that difference in the coefficients on the regional dummy is the culprit. For females, it is sufficiently negative at the lower end of the wage distribution to offset other (positive) factors, resulting in a small wage structure effect. The negative sign of the difference in the coefficients on the regional dummies suggests that Vietnamese females are not penalised as much as their Chinese counterparts if they reside in a region where income/expenditure is below the average. Hence, it works to narrow the China–Vietnam wage gap.

Recall that wage structure effect captures the return to the unobservables that may reflect the different pace of reform in the two countries. Aside from the SOE reform discussed earlier, the coastal-led development strategy in China, which is well-documented, could be regarded as another dimension characterising the differences in the pace of economic reform between the two countries. This strategy has led to rapid growth in the coastal region (richer region), leaving inland region (not-so-rich region) behind and giving rise to the substantial coastal-inland inequality since the reforms (Gustafsson and Li, 2000; Zhang and Zhang, 2003). This development strategy would potentially result in a more uneven regional growth relative to Vietnam. In this context, our results suggest that different pace of reform across different regions may affect female and males differently. Like most economic policies, this coastal-led economic liberalisation strategy may not be gender-neutral. For instance, relative to Vietnam, if more new economic opportunities, such as the export processing zone, that

[31] As discussed earlier, the covariates such as human capital, ownership, and industrial distribution are widely accepted dimensions with immense policy importance. These wage covariates may not capture all the differences in institution and governance between the two countries given the complexity in measuring various policy measures and complicated channels of policy effects. As a result, the differences in the coefficient estimates may reflect some of the unobserved/uncontrolled differences between the two countries.

Table 5
The UQR decomposition of the ln hourly wage gap between China and Vietnam, by gender.

	Mean		0.1		0.25		0.5		0.75		0.9	
	Wage structure effect	Comp. effect	Wage structure effect	Comp. effect	Wage structure effect	Comp. effect	Wage structure effect	Comp. effect	Wage structure effect	Comp. effect	Wage structure effect	Comp effect.
Men												
Total gap	0.211	0.023	0.2454	−0.0273	0.2265	0.0686	0.2823	0.0482	0.2283	0.0423	0.1692	−0.0151
Education	−0.1740	0.2421	−0.1973	0.6346	−0.0986	0.4334	−0.2609	0.2176	−0.2653	0.0830	0.1435	−0.1668
s.e.	0.0067	0.0054	0.0168	0.0153	0.0102	0.0097	0.0097	0.0101	0.0099	0.0083	0.0120	0.0091
Experience	−0.0419	0.0895	0.0395	0.1607	−0.1863	0.2499	−0.0734	0.0355	−0.0586	0.0651	0.1065	0.0149
s.e.	0.0077	0.0054	0.0156	0.0126	0.0123	0.0094	0.0101	0.0080	0.0094	0.0080	0.0107	0.0095
Ownership	−0.0790	0.0459	−0.1727	0.0273	−0.1129	0.0719	−0.0457	0.0357	−0.0167	0.0449	0.0199	0.0587
s.e.	0.0010	0.0012	0.0029	0.0026	0.0018	0.0018	0.0014	0.0017	0.0014	0.0021	0.0012	0.0035
Industry	0.1580	−0.0492	0.1386	−0.1240	0.1617	−0.0280	0.1360	−0.0178	0.1333	−0.0269	0.1745	−0.0657
s.e.	0.0029	0.0020	0.0051	0.0043	0.0041	0.0035	0.0037	0.0025	0.0047	0.0034	0.0056	0.0043
Others	0.0623	−0.0554	0.0491	−0.0229	0.1130	−0.0496	0.0912	−0.0609	−0.0308	−0.0212	−0.0974	−0.0620
s.e.	0.0086	0.0049	0.0119	0.0075	0.0106	0.0059	0.0115	0.0065	0.0108	0.0068	0.0135	0.0127
Unexplained	0.2855	−0.2501	0.3882	−0.7031	0.3495	−0.6089	0.4351	−0.1619	0.4664	−0.1026	−0.1777	0.2058
s.e.	0.0155	0.0081	0.0225	0.0194	0.0171	0.0139	0.0211	0.0143	0.0182	0.0106	0.0256	0.0142
Women												
Total gap	0.2173	0.0356	0.0475	0.0711	0.16	0.0878	0.2815	0.0403	0.3765	0.0109	0.3192	−0.0137
Education	0.1391	0.0134	−0.0975	0.4058	0.4869	−0.0630	0.3333	−0.0303	0.0584	0.0161	−0.3966	0.0313
s.e.	0.0096	0.0067	0.0141	0.0122	0.0129	0.0120	0.0102	0.0077	0.0130	0.0110	0.0218	0.0200
Experience	0.2836	0.0169	0.2708	0.0242	0.4846	−0.1061	0.3818	−0.0905	0.0062	0.1118	0.0791	0.0784
s.e.	0.0054	0.0036	0.0101	0.0065	0.0101	0.0073	0.0089	0.0068	0.0083	0.0062	0.0140	0.0101
Ownership	−0.0363	−0.0075	−0.0783	0.0287	−0.0017	−0.0257	−0.0235	−0.0033	−0.0184	−0.0025	−0.0214	−0.0035
s.e.	0.0013	0.0011	0.0024	0.0020	0.0026	0.0025	0.0020	0.0020	0.0013	0.0018	0.0022	0.0020
Industry	0.0045	−0.0043	−0.0680	−0.0038	−0.0239	0.0186	0.0461	−0.0180	0.0476	0.0027	0.0486	−0.0202
s.e.	0.0030	0.0019	0.0065	0.0044	0.0047	0.0032	0.0040	0.0026	0.0040	0.0031	0.0057	0.0053
Others	−0.1438	−0.0386	−0.2367	0.1109	−0.1113	−0.0341	−0.1329	0.0169	−0.0084	−0.1224	−0.2563	−0.0803
s.e.	0.0104	0.0042	0.0082	0.0048	0.0086	0.0042	0.0108	0.0046	0.0110	0.0052	0.0179	0.0105
Unexplained	−0.0298	0.0555	0.2572	−0.4947	−0.6746	0.2981	−0.3232	0.1655	0.2910	0.0052	0.8658	−0.0194
s.e.	0.0180	0.0080	0.0217	0.0157	0.0234	0.0185	0.0211	0.0144	0.0224	0.0150	0.0316	0.0213

particularly hires (low and lower skilled) female workers, are highly concentrated in the coastal region[32] and pay relatively higher wages (than other local firms), the Chinese female workers located in the inland regions would suffer from a heavier wage penalty than their Vietnamese counterparts. Within the wage structure effect, this offers a plausible reason why the regional dummy accounts for such a large (negative) portion that offsets the impact of other positive contributors at the low end of the wage distribution. This results in a relatively small wage structure effect in contrast to the dominating wage structure effect for males.

6. Conclusion

Using the CHIP 2002 and VHLSS 2002, this paper compares the wage determination and wage distributions between urban China and Vietnam workers to shed light on the sources of their relative wage differences. Their different depth in SOE reform, education policy, as well as trade liberalisation has led to differences in the composition of, as well as in the returns to education and experience, ownership and industry, hence very different wage distributions of the two countries.

In terms of the wage outcome, the Chinese workers received higher pay than their Vietnamese counterparts in 2002. In addition, the wage gap between state and private enterprises was much larger in China than in Vietnam. This result may relate to the profitable SOEs having more autonomy to pay their workers extra in terms of bonuses and subsidies relative to those in Vietnam; as well as the active policies launched by the Chinese government in the late 1990s to increase public sector wages to retain skilled workers. It may also reflect that the Chinese government has stronger control of profitable SOEs than in Vietnam. Further, the Chinese employers reward education of lower paid workers (i.e. at the lower end of the wage distribution) higher than their Vietnamese counterparts. However, at the higher end of the wage distribution, Vietnamese workers were paid more for an additional year of education than the Chinese workers.

We decompose the China–Vietnam pay gap into the wage structure effect and the composition effect using the DFL method. The results show that for men, the wage structure effect is the key factor that explains the observed inter-country wage differentials both at the mean and along almost the entire wage distribution. For females, the composition effect is more important than the wage structure effect only for the part of the wage distribution below the 20th quantile.

Very little research has been done on cross-country comparisons of wage outcomes between Asian transitional economics. As far as we are aware, Bargain et al. (2009) is the closest to the spirit of this paper. It examines and decomposes the earnings between the Chinese and Indian workers using conditional quantile regression methods. This is arguably the only study to which we can draw broad comparisons with.

Bargain et al. (2009) conduct detailed decomposition of the Indo-Chinese wage differential at the mean using the traditional Oaxaca–Blinder method. Their results show that in the early 2000s, the difference in returns to industry was the largest contributor to the wage structure effect; and the distributional difference in education is the largest contributor to the composition effect.

Using the conditional quantile regression decomposition method developed by Melly (2005), Bargain et al. (2009) find that in the early 2000s, the composition effect contributed more than the wage structure effect to the Indo-Chinese wage differentials at the means and at the lower part of the wage distribution; but at the upper end of the wage distribution, the wage structure effect contributed more than the composition effect. Unfortunately, Bargain et al. (2009) do not conducted further detailed decomposition of the wage structure and composition effects. Therefore, deeper comparisons cannot be drawn.

This paper, however, departs from Bargain et al. (2009) and undertakes the unconditional quantile regression decomposition procedure proposed by Firpo et al. (2007) to further identify the contributing factors to the wage structure effect and the composition effect respectively. We find that, for men, the difference in the returns to industry appear to be the key contributing factor to the wage structure effect. For women, the difference in the returns to education and experience are the important contributors at the middle of the wage distribution.

Our results highlight the complexities of inter-country wage comparison. Simply comparing wages without understanding the sources would potentially misjudge the situations. While China may no longer be an economy where workers work for low wages, Vietnam may not be ready to substitute as the 'China alternative'. Despite the lower wages, the relatively lower skill workforce and the less competitive industry as a result of the interplay between the less extensive ownership reform and trade liberalisation may erode its attractiveness. Deeper institutional reforms in various fronts especially regarding the state sector as well as in higher education sector aiming at generating high quality skilled workers are some key policy areas for Vietnam.[33]

Appendix A. Data Appendix

1. Urban–rural division: The urban and rural areas are divided according to whether households are officially registered. For Vietnam, 'VHLSS sample is limited to long term, legally registered households' (Pincus and Sender, 2006: 41). For China: CHIP surveys only cover households with urban registration (hukou).

[32] According to Wang and Hu (1999), 'all special economic zones, open cities, customs-free zones, and the majority of economic technological development zones established before the mid-1990s were located in the coastal area'.

[33] Governance, infrastructure and the depth of the domestic market are other important areas that deserve attention for policy makers (Vu, 2009) but are not within the scope of this paper.

2. Hourly wages (in PPP): (Gross) wages and salaries plus other subsidies divided by the number of work hours converted into PPP equivalence.
3. Potential experience: Age minus years of education minus school entry age.
4. Years of education: For China, years of education is provided by the CHIP dataset; for Vietnam, it is compiled based on the questions 'Which grade has you completed?' and 'what is your highest degree obtained?
5. Industry: The CHIP survey collects industry information from the question: "What industry is your working unit?". Respondents choose from 16 industries. We grouped these industries into 11 categories by combining, for example, agriculture, mining and geographical prospecting and irrigation administration into "agriculture and mining". We ended up with 11 industries. As the VHLSS contains more refined industry classifications (2-digits), we matched VHLSS 2-digit industry code into the 11 categories according to the CHIP description.
6. Ownership: State sector: For China, it includes government institutions, SOEs at local and central/provincial; state shareholding company. For Vietnam, it includes government agencies, police, military; Communist party, social organization; and state owned enterprises; and other state economic sector.
   Collectives: Same for both countries.
   Private firms: For China, it includes private firm (including partnership), other share-holding company; and self-employed. For Vietnam, it includes individuals worked for other households, private capitalist economic sector; and self-employed.
   Foreign firms: For China, it includes Sino-foreign joint venture and foreign company. For Vietnam, it refers to foreign firms as well as state capitalist economic sector. State capitalist economic sector is an old economic term that has been proposed in 'Strategy for Socio-economic Development 2001–2010' (http://www.eclac.org/iyd/noticias/pais/2/31522/Vietnam_doc_1.pdf). The VHLSS 2002 defines it as the cooperation between SOEs and private or foreign sector. While the exactly meaning is still debateable, there are only 74 observations in the sample.
7. Regions that below average income: For China, individuals reside in areas other than Beijing (national capital), Jiangsu and Guangdong (eastern and southern coastal regions) are considered as living in a region that is below the average household income per capita. As Vietnam is a more agrarian economy, household expenditures instead of household income are widely used in empirical work on Vietnam. Income is subjected to seasonality of agricultural activities. Areas other than Southeast and Mekong River Delta are the regions that are below average household per capita expenditures.

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