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Abstract. We document and discuss the implications of a sharp increase in the regional dispersion of skill premia in China in recent years. This has previously been little noted or discussed. We use three urban household surveys for 1995, 2002, and 2007 and estimate skill premia at provincial and city levels. Results show an increase in the skill premium across all regions between 1995 and 2002, but only coastal regions show significant increases in skill premia between 2002 and 2007. For 2007, coastal regions also have much higher within-region wage inequality, and this contributes more to overall urban wage inequality than within-region inequality of non-coastal regions. Using a fixed effects model at city level, we find that ownership restructuring is a significant factor in driving up skill premia during the first period (1995 to 2002), and that the ongoing process of China's integration into the global economy plays a significant and regionally concentrated role in the second period (2002 to 2007). Finally, we suggest that the Hukou registration system may prevent skilled labour from moving to high skill premium regions and retard mobility-induced reductions in inequality. This effect may also retard even higher growth.

Key Words: Skill Premia, Regional Distribution, Inequality, Urban China

JEL Classification: I24; J24; R23

1. Introduction

The behaviour of the skill premium (the wage differential between skilled and unskilled labour) is central to an understanding of the evolution of inequality in urban China. In this paper we use education as a measure of skill, and use the terms skill premium and education premium (or the return to education) interchangeably.[1] There has been a large amount of research aiming to estimate the skill premium over time (see Zhang et al., 2005; Li and Ding, 2003).[2] How the skill premia have evolved within regions and how this may have affected overall inequality is, however, largely neglected in literature.

One major reason for our investigating the regional dimension of skill premia is China's large regional gap in economic development. Between 1995 and 2007, coastal provinces had higher rates of growth than hinterland provinces. In 2007, the GDP per capita of the richest province, Shanghai, was nearly 10 times that of the poorest, Guizhou (National Bureau of Statistics, 2008). Regional income inequality has thus become a major contributor to China's overall inequality, and regional imbalance has also become a threat to the sustainability of China's high levels of growth. While the regional income gap has been studied extensively, little attention has been given to differences in skill premia across regions, which is another important dimension of an

[1] In this paper we use education levels to define a dummy variable indicating whether a worker is skilled or unskilled. Since data on years of schooling and education levels is available, we also use this data directly.

[2] There are also many estimates of the return to education across other divides. Dong and Bowles (2002), for instance, estimate the return to education by ownership.

understanding of overall inequality, which also has implications for the mobility of workers with different education levels.

Here, we use three Chinese urban household surveys, from 1995, 2002, and 2007, to estimate skill premia at a provincial and prefecture (or city) level for each year. Provinces are the highest-level administrative divisions in China, and prefecture-level cities (hereafter cities) are administrative subdivisions of provincial-level divisions. Municipalities directly under the central government (Beijing, Chongqing, and Shanghai)[3] are treated as both provinces and cities in the estimation. We often use the term "region" to encompass these various interpretations. We find substantial yearly dispersion across regions, but also find an increase in skill premia across all regions between 1995 and 2002, while only coastal regions show significant increases in skill premia between 2002 and 2007.

By combining the estimated city skill premia and other variables at city level, we use a fixed effects model to determine which factors account for the increase in skill premia. In the 1995 to 2002 period, institutional change (i.e., ownership restructuring) seemingly plays a key role in driving up the skill premia in the various regions. We find a significant relationship between export activity and increases in skill premia in the 2002 to 2007 period, suggesting that China's entry into the World Trade Organisation (WTO) and its wider integration into the global economy after 2001 may have played a significant role. We also discuss the possibility that high migration rates of unskilled labour slow the growth of real wages and drive up skill premia in coastal

[3] Tianjin, another municipality, was not covered by the survey.

regions. We only find weak evidence for this hypothesis.

Investigating how the regional distribution of skill premia changes provides a deeper understanding of changes in urban wage inequality. Decomposition exercises show that, by 2007, coastal regions have much higher within-region inequality (because of higher skill premia), and this contributes more to overall urban wage inequality than non-coastal regions, a feature that has not yet been documented in the literature. An investigation of the regional distribution of skill premia also has implications for growth. In this paper, we view the dispersion of skill premia as a measure of labour misallocation across regions.[4] A wider premia dispersion indicates a greater difference in relative marginal productivity across regions; therefore, a reallocation of labour (through migration) could improve efficiency and promote economic growth.

A more complete picture of urban inequality and the relationship between economic transition and skill premia also has policy implications. First, the fact that skill premia increased sharply in most regions between 1995 and 2007 suggests that the demand for skilled labour had risen faster than the supply, implying that education expansion and training programmes could help reduce skill differentials. As coastal regions have much higher skill premia, which contributes to overall urban wage inequality, the mobility of educated workers could also help reduce overall inequality

[4] In recent years a growing literature emphasises resource misallocation in explaining low economic efficiency (Hsieh and Klenow, 2009). Earlier research focusing on regional inequality and growth considers income differentials across regions and the convergence (or divergence) in income levels in the growth process (Chen and Belton, 1996).

and increase the growth potential of China's economy. The household registration system (i.e., the Hukou system, which restricts population mobility)[5] should be reformed to be more friendly to educated workers. This policy should be prioritised given the sharp increase in the number of college graduates following the initiation of China's higher education expansion in the late 1990s. From the demand side, investing in and offering preferential policies to low premium regions may also help equalise regional skill premia, but these often involve complicated political processes such as negotiations between central and local governments and competition among local governments. Indeed, whether the skill premia dispersion and inequality can be reduced will depend on local circumstances, technology, and the nature of the policies.

This paper is organised as follows: We discuss background and literature on skill premia in section 2; we describe our data in section 3; we report estimates of skill premia, their regional distribution, and evolution over time in section 4; we investigate the factors underlying patterns of regional skill premia over time and discuss the implications for overall urban wage inequality and potential policy actions in section 5; our conclusions are given in section 6.

2. Why is the regional distribution of skill premia important in China?

The Chinese economy grew rapidly between 1995 and 2007 at an average annual growth rate of 10 percent. The 2002 to 2007 period experienced relatively higher

[5] A more detailed discussion of the Hukou system is given in the next section.

growth (National Bureau of Statistics, 2009: Table 2-4), partly due to China's deeper integration into the world economy following its entry into the WTO in 2001. High growth and sharp increase in exports increased the demand for skilled labour in the urban sector. Major changes in the supply side of the labour market included the expansion of higher education, starting from 1999 (Li et al., 2011), and large increases in rural-to-urban migration (Cai et al., 2009). But the supply of skilled workers seems to be outpaced by the demand, and increasing skill premium (and inequality) accompanied China's rapid economic growth (Zhang et al., 2005; World Bank, 2009).

As a large developing country in economic transition, China's various regions have very different levels of economic development. Earlier research has concluded that regional disparity is a major contributor to overall inequality (Gustafsson et al. 2008). The literature has, however, failed to consider that the relative wages of skilled and unskilled labour may be different across regions. Given the considerable effort devoted to estimating skill premia, the extension to include the regional dimension is a natural next step.

Institutional factors may play a role in causing skill premia differentials among regions. In the late 1990s, many small- to medium-sized state-owned enterprises (SOEs) in the urban sector were privatised (Appleton et al., 2002; Solinger, 2002), and many workers were allocated to the private sector. Different regions also had a different firm ownership mix. In 2008, for example, the registered employment share in SOEs was around 30 percent for most coastal provinces, while for other provinces such as Jiangxi, Guangxi, Shaanxi, Gansu, and Qinghai the shares were still above 70

percent (National Bureau of Statistics, 2009).[6] If wage determination mechanisms were significantly different across firm ownership types, with private sector firms and joint ventures sharing a higher skill premium (Meng, 2000; Dong and Bowles, 2002; Xing, 2008; Zhang et al., 2005), skill premia will vary across regions.

Another reason for regional unevenness is different exposure to trade activity. The policy of opening up was first implemented in the east and led to rapid growth of exports and FDI inflows. In 1995, the average share of exports in GDP in coastal provinces was 32 percent, while that of non-coastal provinces was below 7 percent.[7] China experienced a sharp increase in trade activity in a relatively short period of time after its entry into the WTO (Wan et al., 2007; Branstetter and Lardy, 2006), and most of the increase was in coastal regions.[8] By 2007, the average export share in GDP in coastal provinces had reached 45 percent, while that of non-coastal provinces was still below 8 percent. Along with rapid export growth, China's exports were becoming

[6] These shares are calculated using the number of staff and workers in state-owned units divided by the total number of registered employees. All numbers are for urban areas (National Bureau of Statistics, 2009: table 4-8). Taking into account those not registered, the SOE shares may overestimate the real shares.

[7] Coastal provinces include Beijing, Fujian, Guangdong, Hainan, Hebei, Jiangsu, Liaoning, Shandong, Shanghai, Tianjin, and Zhejiang. Non-coastal provinces include Anhui, Gansu, Guangxi, Guizhou, Henan, Heilongjiang, Hubei, Hunan, Jilin, Jiangxi, Inner Mongolia, Ningxia, Qinghai, Shanxi, Shaanxi, Sichuan, Tibet, Xinjiang, Yunnan, and Chongqing. Export shares are first calculated for each province, and then averaged for coastal and non-coastal regions. The shares for 2007 are calculated in the same way.

[8] Most exports in the export growth regions came from foreign-invested enterprises, Hong Kong-Macau-Taiwan invested enterprises, and joint ventures. According to our calculation using the Chinese industrial enterprises database, exports from foreign-invested enterprises accounted for 23 percent of the total exports from firms located in coastal areas in 2002, and it increased to 35 percent by 2007. Export growth throughout China shows a similar pattern. Detailed results are available upon request.

more sophisticated with resources moving from agriculture and textiles into machinery, electronics, and assembly (Schott, 2006; Amiti and Freund, 2008; Wang and Wei, 2008). A deeper integration into the world economy can affect skill premium through several channels.[9] First, skill premium may increase if more production of intermediate goods, which could be characterized as skilled-labour intensive from China's perspective, is shifted from developed countries to China. Second, skill premium may increase if the capital inflows into China require more skilled labour. More fundamentally, greater openness may induce technological change in the form of increased imports of machines, office equipment, and other capitals, which increased the demand for skilled labour. Third, the adoption of foreign business practice through joint ventures may also affect skill premium. As trade activity and FDI are regionally concentrated, these effects vary across regions.[10]

These regional patterns reflect, in part, the policies of the Chinese government. In the earlier reform period, the central government offered not only preferential policies, but also more investment to coastal regions to encourage exports and attract

[9] There also have been efforts trying to relate China's globalization process to inequality. See Zhang and Zhang (2003), Wei and Wu (2003), Wan et al. (2007), and Cai et al. (2010). All these papers, using aggregate data, focused on the relationship between globalization and regional disparity.

[10] It is worth mentioning that these forces combined with ownership restructuring have probably changed the "internal" wage inequality within firms. However, we know little empirical evidence on this, partly because individual-firm matched data are unavailable. We use information for companies listed in the Shanghai Stock Exchange to see one aspect of the internal inequality, namely the pay gap between top executives and ordinary workers. The ratio of average compensation for the top three executives to that of average workers increased significantly from 4.7 in 2001 to 7.9 in 2010, and the gap was larger for private companies than for SOEs.

FDI. The five Special Economic Zones (SEZs)[11], for example, are all in coastal regions (Wang and Wei, 2008). However, in the late 1990s, because of the widening regional gap, preferential policies were more often designed for the central and western regions. Many other policies were also location-specific, such as policies for developing the Pudong New District in Shanghai, the Binhai New District in Tianjin, and the more recent strategy to revitalise the Old Industry Base of the Northeast. These initiatives often involve preferential policies of the local and central governments, such as lower income tax rates for foreign invested enterprises, fewer entry barriers into the finance and service sectors, more favourable treatment for land use permissions, subsidies for industrial upgrading, etc. All these policies tended to increase local demand for labour.

Several features of China's labour market have made this process less effective, although labour migration still tends to equalise relative wage gaps among regions. In particular, the Hukou system, which was originally designed to control rural to urban migration in the 1950s by registering household members in designated rural or urban locations, still imposes high moving costs for migrants. Traditionally, one's Hukou status is categorized by both socio-economic eligibility ("agricultural" and "non-agricultural" Hukou) and registered residential location (local and non-local Hukou) (Chan and Buckingham, 2008).[12] Hukou status in registered location confers

[11] The five coastal cities are Shenzhen, Zhuhai, Shantou, Xiamen, and Hainan.

[12] The first classification determined entitlement to state-subsidized food grain and other prerogatives. The second classification defines one's rights for many activities in a specific locality. One's Hukou status (locality and socio-economic categories either agricultural or non-agricultural) is determined by birth, following his/her parents.

specific local benefits, including access to health care, free public education, legal housing, and better access to jobs. To migrate permanently, you need to change registration location.[13] Both the process and the number of such moves were tightly controlled by the government. Temporary migrants, who cannot change registration location, also needed official approval (like a "visa"). To migrate without authorization, people were vulnerable to round-ups and deportation. Local citizenship benefits were inaccessible to temporary migrants.

Hukou policies have been becoming more flexible since the 1980s. One major change was the localization of Hukou management, with many local governments having received full power to determine their own criteria and the number of new permanent Hukou they would grant. It has become easier for workers and households to transfer their registrations to other locations (in particular, to small- to medium-sized cities), and temporary residence permits are being granted more often. Also, it became possible for some to migrate and get a job without a valid permit. But for temporary migrants, skilled or unskilled, local public services remain either inaccessible or expensive. Compared to unskilled workers, skilled workers are more

[13] Due to significant differences in employment opportunities and welfare and benefit entitlements, there is a strong incentive for rural residents to change their Hukou registration from rural to urban areas. Prior to the late 1990s, such changes also required approval from the state to convert Hukou status from agricultural to non-agricultural. This change can only be made through certain channels and complicated procedures, and these channels generally favour individuals with more skills and/or special achievements. Going to college has been a major channel that increases the probability of a favourable Hukou status. Other channels that increase this probability include serving in the military, being recruited by SOEs or the government (Wu and Treiman, 2004; Fan, 2008), rural residents' lands being occupied by urban construction projects (Wong and Huen, 1998), and rural households purchasing urban housing (Deng and Gustafsson, 2006).

likely to secure local citizenship when they migrate, but still many cannot change their registration location, especially when they move to large cities.

Using a random sample of the 2005 one percent population survey, we show two pieces of evidence, which suggest that the labour market for skilled workers is far from efficient. First, there is a large share of skilled workers who do not have a Hukou status of his/her working place. Second, the regional wage dispersion of skilled workers were much larger than that for unskilled workers.[14] Given these, even the evidence on the Hukou system's disproportional constraining effects on skilled and unskilled workers is weak, the government can still choose its priority when reforming the Hukou system, putting skilled over unskilled workers.

All of the above are also often cited as reasons for growing regional disparity in income levels, instead of changes in the relative wages of skilled and unskilled labour. Existing literature has largely neglected the possibility that these regional imbalances (e.g., in trade policies) and institutional arrangements (e.g., the Hukou system) may have different impacts on individuals with different skills.

3. Data and summary statistics

[14] While higher wage levels (of the skilled) and higher skill premia in some regions were directly caused by the slow adjustment in the production of educated workers relative to an increase in the demand, a large *regional dispersion* (both in wage levels and skill premia) is more closely related to the mobility of labour and the functioning of the labour market. Even without new college graduates entering into the labour market, wage levels of the skilled in high wage regions will decrease if more existing skilled workers migrate to those regions.

We use data from three China Household Income Project (CHIP) surveys (1995, 2002, and 2007) to estimate the regional dispersion of skill premia over time. The CHIP data is known for its high quality and national representativeness. In 1995, 2002, and 2007, the urban surveys covered 11, 12, and 16 provinces or municipalities respectively, which included a wide variety of regions in terms of geography and economic development. These surveys were designed to cover households with non-agricultural Hukou registration within the surveyed city. In practice, however, a small number of migrant households were included.[15] In 1995 and 2002, the surveys collected information from Beijing, Shanxi, Liaoning, Jiangsu, Anhui, Henan, Hubei, Guangdong, Sichuan, Yunnan, and Guansu—these are provincial-level divisions, and Chongqing is separated from Sichuan as a municipality that has been directly controlled by the central government since 1997. One municipality (Shanghai) and three provinces (Zhejiang, Fujian, and Hunan) joined the 2007 survey. Each province or municipality is treated as a unit, and we use observations within each unit to estimate provincial skill premium. Municipalities and cities within provinces are treated as units when we estimate city-level skill premia. As CHIPs do not follow individuals over time, they do not constitute panel data.

We retain information on males aged 22 to 60 and on females aged 22 to 55.[16]

[15] In 2002 and 2007, around 1.7 percent of the individuals in the sample have agricultural Hukou, and 0.56 percent (2002) and 1.05 percent (2007) of the individuals in the sample have non-agricultural Hukou but registered other than the city of workplace. We do not have this detailed information for 1995, but we conjecture that the number of migrant households was even smaller.

[16] We keep those above 22 years of age because people going to college typically finish at age 22 in China. The age thresholds of 60 and 55 for males and females reflect current arrangements for retirement age. Our results are

We use labour incomes of urban workers, which include regular wages and subsidies and other labour income. The terms "wage" and "income" are used interchangeably. All income data are at the individual level and are deflated using provincial CPIs. The price levels for all provinces are normalised to one in 1995, and subsequent provincial CPIs are used to calculate the price levels for 2002 and 2007.[17]

Because the sampling process of these surveys is based on formal residence registration (Hukou), the data we use exclude most migrant households in urban areas without formal residence permits. Considering the large number of rural-to-urban migrants and the fact that they are usually less educated and worse-off than local urban workers (Démurger et al., 2009), our data may produce a biased skill premium. By focusing on a sample with urban Hukou, there is less need to consider the monetary value of Hukou. Consequently, we are unable to use our findings to infer the wage compensation differential due to Hukou status.

Table 1 provides summary statistics.[18] Both the average age and education level increased continuously over these years. In 1995, the average age of the urban working population was 39.5, increasing to 41.5 in 2002, and further to 42.3 in 2007. The average years of schooling increased from 10.8 in 1995 to 11.3 in 2002 and to 12.7 in 2007. Looking at different education levels a more detailed pattern of

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not sensitive to the choice of age thresholds.

[17] As our focus is the relative income of skilled to unskilled workers in each region, using regional or national CPIs will not influence our estimate of the skill premia and their distributions.

[18] We only report the summary statistics for the observations with positive labour income. Including observations without income does not change the results significantly, and we do not report them.

education expansion emerges. The share of the population with tertiary education increased significantly between 2002 and 2007. Changes in the share of labour force for different firm ownerships types reflect the restructuring process in urban China. In the mid-1990s, over 80 percent of the workforce was employed in the public sector in various forms.[19] By 2007, that share had decreased sharply to 53 percent, while the number of workers in the private sector increased significantly.

Table 2 reports skilled worker shares (columns 1 to 3), income levels (columns 4 to 6), and inequalities (columns 7 to 9) by province. Those with college degrees (3 or 4 years) or above and those with technical school degrees are defined as skilled workers in this paper, and the others are classified as unskilled workers. As a whole, the share of skilled workers increased from 40 percent in 1995 to 43 percent in 2002 and to 52 percent in 2007. The pace of this increase differed across provinces; for example, the share of skilled workers increased by over 20 percent between 2002 and 2007 in Henan, but it barely increased at all in Yunnan.

There were significant increases in income between 1995 and 2007. Annual average wages increased from 6,209 Yuan in 1995 to 9,772 Yuan in 2002 and further to 16,173 Yuan in 2007. Data also indicate that both income levels and income growth

[19] The public sector includes (1) government employees and (2) workers in SOEs. Between 1995 and 2002, the shrinking of public sector was mainly due to the reduction of employment in SOEs (from 52 percent in 1995 to 33 percent in 2002). But, we cannot distinguish these two types of employment in 2007. In 1995 and 2002, wage regressions controlling for a dummy of government or SOE employees produces similar skill premia to those controlling for two dummies denoting government employees and SOE workers. Therefore, we put these two types of employment into one category for all three years in this paper.

were unbalanced across provinces, with coastal regions having higher income levels and growth rates. In terms of Gini coefficients, there was a significant increase in inequality for every province between 1995 and 2002. On the whole, the Gini coefficient increased significantly from 0.296 to 0.373. For the 2002 to 2007 period, the Gini of the whole sample increased modestly from 0.373 to 0.407, but the change differed across regions. For some hinterland provinces, Gini coefficients decreased (e.g., Shanxi and Henan), while for coastal provinces, Gini coefficients increased (e.g., Jiangsu).

4. The regional distribution of skill premia (the returns to education)

4.1 Wage levels of skilled and unskilled workers and skill premia

To see how the income gaps between skilled and unskilled labour (a crude measure of skill premium) differ across provinces and how the pattern evolves over time, we report income and income growth for unskilled and skilled workers and their gaps by province in Table 3. The income gaps were moderate in the mid-1990s, except for Guangdong. By 2002, the income gap for all provinces had increased significantly, with some indication that the skilled/unskilled gap in coastal provinces was larger. Between 2002 and 2007, the gaps in coastal provinces were still growing faster than those in non-coastal regions. Thus, skilled workers in coastal regions have higher wages relative to unskilled workers than their non-coastal counterparts. Regional disparity for unskilled workers also exists, but it is not as noticeable as for skilled workers. For example, the Beijing-Shanxi income gap for skilled workers

increased sharply from 3,637 Yuan in 1995 to 4,224 Yuan in 2002 and further to 9,942 Yuan in 2007, but the income gap for unskilled workers remained below 3,800 Yuan in all three years. Finally, the results in Table 3 suggest that the increase in income gaps was mainly due to the faster income growth of skilled workers rather than to the decline or slow growth in the income of unskilled workers.

The above wage gaps may reflect the effect of other factors, including different age and gender distributions, ownership structures, and industry compositions.[20] We show the above regularities by estimating the following model:

$$\ln(WAGE) = \beta_0 + \beta_1 * SKILLED + \gamma X + \varepsilon \qquad (1)$$

where *SKILLED* is a dummy variable indicating that an individual has tertiary education (3 or 4 year college degree or above) or technical school degree. Its coefficient β_1 reflects the extent to which skilled workers earned more than unskilled.[21] Vector X includes experience (= age minus years of schooling minus six), experience squared, a gender dummy, an ownership dummy, and industry dummies.

We estimate model (1) by province for each year, and the coefficients for

[20] Non-work rates may also be different across regions. When samples with wage incomes are not selected from the working age population at random, the skill premiums using the observed data may be subject to selection bias. These concerns can be addressed by using Heckman's two-step selection model (Heckman, 1979), which gives similar results to OLS; thus, only OLS results are reported.

[21] More rigorously, the skilled earn 100*[exp(β_1)-1] percent more than the unskilled according to model (1); when β_1 is near zero, exp(β_1)-1≈β_1. Even when β_1 is large and exp(β_1)-1>β_1, the patterns of the regional distribution of exp(β_1)-1 and β_1 will be similar, with exp(β_1)-1 showing a wider dispersion. For ease of exposition, we report β_1 directly in the text.

SKILLED are reported in Table 4. For the earlier period (1995 to 2002, columns 1 to 2), the skill premia increased sharply across all regions. This is consistent with existing literature that documents an overall increasing trend in the return to education (Liu et al., 2010; Zhang et al., 2005). Less well documented is the large variation across regions in skill premia. In 1995, the skill premium in Guangdong was the highest (0.399), while that of Beijing was the lowest (0.132). The second lowest was Yunnan (0.153) followed by Sichuan (0.165). In 2002, Beijing remained the province with the lowest skill premium (0.249) and Gansu became the province with the highest skill premium (0.473), followed by Liaoning (0.470), Guangdong (0.430), and Sichuan (0.430). Gansu and Sichuan are western provinces, and for these there seems to be no clear relationship between skill premia and economic development. For the period between 2002 and 2007 (columns 2 to 3), there are signs that skill premia stopped rising or even declined in central and western provinces (see Shanxi, Chongqing, and Gansu for example). For coastal regions skill premia kept rising.

4.2 The return to years of schooling and the returns to different education levels

Dividing the labour force into skilled and unskilled categories is a simplification, since along with educational expansion in the late 1990s there were significant composition changes within each group. In the unskilled group the relative number of high school graduates increased significantly, as did the relative number of college graduates in the skilled group (see Table 1). Estimated skill premia may thus be contaminated by these changes. Therefore, we estimate the returns to years of schooling and the returns to various levels of education using two different models:

$$\ln(WAGE) = \beta_0 + \beta_1 * SCHOOLING + \gamma X + \varepsilon \quad (2)$$

$$\ln(WAGE) = \beta_0 + \sum_i \gamma_i * EDU_i + \gamma X + \varepsilon \quad (3)$$

In model (2) *SCHOOLING* is years of formal schooling, and in model (3) EDU_i are dummies for various education levels. X controls for the same factors as in model (1). Results for these models are reported in the remaining columns of Table 4, and generally, the patterns of these results are consistent with our results as presented above. For the returns to years of schooling (columns 4 to 6), the most important feature is the large regional variation in 2007. While the returns are as high as 10 to 14 percent in coastal regions, they are well below 10 percent in non-coastal provinces. The standard deviation of these provincial returns was 0.024 in 2007, doubling that of 2002 and more than tripling that of 1995 (see last row of Table 4).

The college premia show similar patterns, but their dispersion increased only slightly (columns 7 to 9). For space reasons the returns to other education levels are not reported, though some features of these returns are worth noting. First, most of the increases in the returns to education are concentrated in higher levels of education, especially college education. Second, coastal regions witnessed rising returns for almost every tertiary education level. Finally, the returns to high school decreased between 1995 and 2007.

4.3 Skill premia at the city level

We estimate wage equations for 62, 61, and 91 cities for 1995, 2002, and 2007 respectively, using the same specification as in model (1). After calculating the skill

premia, we estimate their yearly kernel densities non-parametrically, each city being treated as an observation without using city population or employment as weight. We use the Epanechnikov kernel function and the bandwidth set at 0.08. The distributions are reported in Figure 1.[22] Apparently they are non-degenerate in all three years. The distribution moved to the right and became more dispersed between 1995 and 2002. In the second period (2002 to 2007) it moved slightly to the right. A fatter right tail is observed in the 2007 distribution, which is likely explained by the fairly high skill premia of some coastal cities. The regional distribution for the return to years of schooling evolves in a similar way, which we do not report due to space limitations. In the following section, we assess the importance of various factors behind the evolution of these city skill premia and returns to schooling.

5. Explanation of results and their implications

5.1 Factors that influence the evolution of the regional skill premium

In this section, we estimate the following fixed effects model:

$$SKILLPREM_{it} = \beta_0 + \beta_1 * EXPGDP_{it} + \beta_2 * SOE_{it} + \beta_3 * SKILLED_{it} + \gamma X_{it} + u_i + \varepsilon_{it} \quad (4)$$

In this model, subscript i refers to city, and each city is an observation in the estimation; t=1995, 2002, or 2007 refer to the survey year. *SKILLPREM* is the estimated skill premium or return to years of schooling in section 4.3, and (unlike

[22] We also estimate kernel densities for the distribution of city skill premia for cities common to all three surveys. While only 33 cities remained and the estimates became less accurate, the regional distribution evolved in a similar pattern. We do not report it to save space.

wages in wage equations) it is not specified in log form. We use the ratio of exports to GDP, $EXPGDP_{it}$, to measure the openness of city i at time t. SOE_{it} is the share of the labour force in state-owned enterprises or governments. $SKILLED_{it}$ is the share of skilled labour in the labour force. Vector X controls for wage levels and age structures. u_i is a time invariant unobservable regional characteristic. 33 cities that participated in all three surveys are used in the regressions.

The results are reported in Table 5. In columns 1 to 3 we use the returns to years of schooling as the dependent variable. Column 1 shows the results when all three years are used. The only coefficient that is significant is for *SOE*, suggesting that ownership restructuring played a significant role between 1995 and 2007; however, some factors may have different impacts over time. Columns 2 and 3 report the results for the two periods of 1995 to 2002 and 2002 to 2007. In the first period, export activity did not play a significant role. The coefficient on *EXPGDP* is small (-0.021) and its standard error is relatively large (0.047). For the 2002 to 2007 period, the coefficients on openness (*EXPGDP*) become significantly positive. A 10 percent increase in export share was associated with a 1.5 percent increase in the return to schooling. The change in the coefficient on the export variable indicates a structural change after China's entry into the WTO. Indeed, export volumes increased sharply in this period, trade activity became more regionally concentrated, and export products became more sophisticated. These factors increased the demand for skilled labour in coastal regions and caused a wider regional dispersion of the returns to education.

Equally interesting are the coefficients for *SOE*. Between 1995 and 2002, the

coefficient of *SOE* was significantly negative, which means that the relative reduction in the size of the public sector played a major role in the increase of the returns to education. This result is consistent with the fact that the private sector had higher returns than the public sector. The coefficients of *SOE* only became significant (at the 10 percent level) between 2002 and 2007, although the absolute value increased. Considering that the SOE shares decreased more sharply in the first period (see Table 1), ownership restructuring played a larger role in the former than in the latter period. Columns 4 to 6 use city skill premia as the dependent variable and lead to similar conclusions.

Due to data limitations, we cannot explore all of the factors that may affect regional skill premia. One unexplored hypothesis is that high migration rates of unskilled labour slow the growth of real wages in coastal regions and drive up skill premia there. We use information from the 2005 one percent population survey to shed light on this. Figure 2 plots the relationship between skill premia and the migrant shares of skilled and unskilled workers in the urban labour market.[23] We run a regression of log of wage on a skill dummy for each province to calculate skill premium, controlling for age, age squared, and gender. In this dataset, the skilled workers are those with degrees higher than high school, and the migrants are those who have left their Hukou registration location to work in another city more than half a year. Figure 2 shows that the migrant shares of unskilled workers are higher than the

[23] The migrant share of (un)skilled workers is calculated using formula:

[number of (un)skilled migrants]/[number of (un)skilled workers in urban labour market].

migrant shares of skilled workers, especially in coastal provinces. However, there is only a weak positive correlation between the migrant share of unskilled workers and skill premium (bottom panel of Figure 2), indicating that the inflow of unskilled workers is not a significant factor in increases of coastal skill premia.[24] On the contrary, a more significant and larger positive correlation between the migrant share in skilled workers and skill premium is observed in the top panel of Figure 2.[25] High skill premia regions (the coastal regions) having larger migrant share in skilled workers is consistent with the hypothesis that economic growth is biased toward skilled labour, and the growth in skilled labour demand is outpacing adjustment in skilled labour supply either through increased supply of local educated worker or through inter-regional migration.

5.2 Skill premia and inequality

One implication of the evolution of regional distributions of skill premia is in relation to regional inequality. In Figure 3, we plot the relationship between skill premia and wage inequality at the provincial level. In 1995, both skill premia and wage inequalities at the provincial level were low. Between 1995 and 2002, there was a general increase in skill premia across regions. As a consequence, within-region inequalities increased dramatically. Between 2002 and 2007, the dispersion of skill premia across regions also grew, as did inequalities across different regions. In 2007,

[24] Regressing provincial skill premia on migrant shares of the unskilled urban workers results in a coefficient of 0.110(0.119), and the adjusted R-squared is -0.0052. Tibet is dropped in the regression.

[25] Regressing provincial skill premia on migrant shares of skilled urban workers, we get a coefficient of 0.228(0.066), and the adjusted R-squared is 0.2730. Tibet is dropped in the regression.

the relationship between skill premia and inequalities became more positive and significant. We also run regressions of regional Gini coefficients on skill premia in different years; in all of these regressions, the coefficients on skill premia are positive. In the years 1995 and 2002, the coefficients are relatively small and insignificant; however, in 2007 the coefficient is higher and significant at a 1 percent significance level.[26]

Given the positive correlation between regional skill premium and within-region inequality, we can assess the implications of the evolution of the regional skill premium for inequality. First, as skill premia increased significantly across regions, so did within-region inequalities, and it played a progressively important role in determining the level of overall urban inequality and its change.[27] Second, the distribution pattern of the regional skill premia indicates that coastal regions have much higher within-region inequalities. Our exercise shows that within-region inequality in coastal regions has increased more than in non-coastal regions, and contributes more to the increase of overall urban wage inequality.[28]

[26] These coefficients are 0.107(0.086), 0.100(0.082, and 0.221(0.047), in 1995, 2002, and 2007, respectively.

[27] Formally, we decompose the overall urban wage inequality into between- and within-province inequality. To guarantee that the inequality is regionally decomposable, we use an inequality measure of GE(2) (Generalised Entropy Index with sensitivity parameter 2). This decomposition can be found in Gustafsson et al. (2008). In 1995, the overall and within-region inequalities measured as GE(2) were 0.181 and 0.140. Between 1995 and 2002, almost all of the increase in overall wage inequality (from 0.181 to 0.284) came from within-region inequality (from 0.140 to 0.243) and between-region inequality decreased slightly. Again, most of the inequality change between 2002 and 2007 (from 0.284 to 0.375) is attributable to within-region inequality (from 0.243 to 0.321). Dropping the four provinces added in 2007 did not change this pattern.

[28] Between 2002 and 2007, the decomposition exercises for the coastal and non-coastal regions show that the

5.3 Policy implications

Our results also have implications for many policy areas, including education and training, the Hukou system, and the unemployment of college graduates. First, there was a sharp increase in skill premium in almost all regions between 1995 and 2007. This suggests that education and training programmes can play an important role in reducing inequality by increasing the skilled labour supply.

Second, the fact that the skill premia have not been equalised across provinces indicates that across-province mobility of skilled labour is insufficient to meet the regional demand shocks. Figure 4 provides further evidence supporting this conclusion. The upper panel of Figure 4 shows that around one-third of the skilled workers are migrants in Beijing, Shanghai, and Guangdong, and over 10 percent of skilled workers in 23 provinces are migrants; these shares are much lower than those for unskilled workers, especially in coastal regions (see the bottom panel of Figure 4). Taking into consideration the large difference in the number of skilled and unskilled workers, skilled migrants are much lower in number than unskilled migrants.[29] Figure 4 also reports the relationship between these shares and real wages of skilled and unskilled workers. The results suggest that skilled workers are less responsive to

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overall GE(2) increased by 0.034 (=0.227-0.193) in non-coastal regions, and that of coastal regions increased by 0.055 (=0.361-0.306). These differential changes are mainly due to the differential changes in within-province inequality, which are 0.032 (=0.223-0.191) and 0.063 (=0.332-0.269) in non-coastal and coastal regions, respectively. Again, dropping the four provinces added in 2007 did not change this pattern.

[29] According to our calculation based on the 2005 one percent population survey, the ratio of unskilled to skilled migrants is 5.8 to 1 in the urban labour market.

regional income differentials than unskilled workers. While wage differences are much larger for skilled workers, their migrant share differences are lower than the share for unskilled workers.[30]

These results point to how college graduates should be allocated under the educational expansion policy, favouring coastal regions over non-coastal regions. As it still poses high cost for a large proportion of skilled workers, relaxing the Hukou system could help facilitate the migration of skilled workers. But could this type of policy widen skill differentials rather than shrink them? This will depend on whether skilled or unskilled labour is more restricted by the Hukou system and how the Hukou system will be changed.

Skilled workers seem to have greater potential to move than unskilled workers do. As shown in Table 3 for 2007, they had larger regional wage differentials than unskilled workers. Also, as shown in Figure 2, the relative number of skilled migrant workers is still low in the urban labour market. Meanwhile, the results in Table 6 indicate that skilled workers have a stronger preference for permanent housing, social security, and public services, which are closely related to Hukou status: Column 1 in Table 6 shows that skilled workers are more likely to purchase permanent housing rather than to rent an apartment or live at construction site dormitories; Columns 2 and 3 show that skilled migrants are more willing to change their Hukou registration

[30] Regressing provincial incomes of the skilled workers on migrant shares of skilled urban workers we get a coefficient of 0.00017(0.000015), much smaller than the results for unskilled workers, 0.00068(0.00008). Dropping Yunnan province produces 0.00017(0.000014) and 0.00072(0.000080), respectively. Tibet is dropped in all regressions.

to their workplaces and to settle down.[31] Therefore, relaxing the Hukou system will probably encourage more skilled rather than unskilled workers to move to high premium cities, reducing inequality there. It is worth mentioning that the Hukou system should be reformed in a step-by-step manner (as it always did), giving cities room to adjust. The government can choose its priorities in the reforming process. Even our conjecture that the Hukou system is constraining relatively more skilled than unskilled labour does not hold, it is reasonable for the government to make the Hukou system more friendly to skilled workers first, especially in high income and high premium regions. Such reform will not only reduce inequality but also face less political pressure from urban residents.

Regional development would lead to a continuing demand for housing and infrastructure investment as larger populations become concentrated in high-income cities. Migrants may face slower growth in housing cost if the housing supply is more elastic. At some stage such investment will face constraints determined by the endowments of a specific area and suffer diminishing returns. These constraints and negative externalities also mean that increasing concentrations of workers in high-wage regions could cause problems related to traffic congestion, pollution, and environmental pressures in labour receiving cities. If skilled workers demand higher compensation for these disamenities, skill premia could remain high in these regions. However, in this case, high skill premium is associated with a smaller inequality in

[31] Column 1 uses the 2005 one percent population survey, columns 2 and 3 use the floating population monitoring data for 2012 compiled by the National Population and Family Planning Commission.

utility. Moreover, as the labour market becomes more flexible labour is allocated more efficiently, which is beneficial for high growth. According to Au and Henderson (2006), who have estimated the inverted U shape function of real output per worker against city scale, China's migration restrictions have resulted in many undersized cities and the costs of being significantly undersized are high. Therefore, encouraging workers especially the skilled to move by reforming Hukou and increasing housing supply will probably induce more returns than costs. Meanwhile, the local governments should improve their management capacity to reduce congestion and pollution costs.

The high premia in some regions also suggests a role for the local government and employers, including the development of education and training programmes. Take Yunnan as an example: Its skill premium increased from 0.307 to 0.483 between 2002 and 2007, but its share of skilled workers remained almost unchanged. In this case, increasing the education level and providing a training programme for unskilled workers may reduce the skill premium and inequality.

On the demand side, investing in and offering preferential policies to low premia regions may also help equalise skill premia across regions; however, location- or industry-specific policies often involve more complicated political processes, and whether this can reduce the dispersion in skill premia and inequality depends on local circumstances, technology, the nature of the policies, and labour mobility.

6. Conclusions

This paper uses three Chinese household surveys (1995, 2002, and 2007) to estimate the levels and changes in skill premia for different provinces and cities. We use the surveys to estimate regional dispersion in skill premia. Although there is an increase in skill premia in nearly all provinces between 1995 and 2002, we do not find such increases between 2002 and 2007. Data from the 2007 survey indicate a strong positive relationship between openness and skill premia, with coastal regions having much higher skill premia than non-coastal regions. We interpret the 2002 to 2007 results as being reflective of China's deepening globalisation after entry into the WTO.

These results also have policy implications. As the employment of skilled workers (college graduates in particular) is an extremely important force for China's urbanisation process, reducing moving and settling costs is needed to sustain high levels of growth and to mitigate inequality. Labour-losing areas may face the phenomenon of brain drain caused by the out-migration of skilled workers. The central government can play a role in balancing economic development by making fiscal transfers from the well-developed to the less-developed regions, and by providing quality public service in education.

In using the CHIPs to estimate the skill premia we exclude most migrants in the labour market. Investigating the compensation differentials regarding Hukou status (i.e., the migrant's marginal willingness to pay for the welfare and benefit entitlements associated with the Hukou status of his/her workplace) is beyond the scope of this paper and we leave it for future research. However, we conjecture that compensation

differentials regarding Hukou status is unlikely to explain the increase in the dispersion of regional skill premia, as there is no concrete evidence that Hukou value increases in high premium regions.

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Table 1. Summary statistics

Variable	1995	2002	2007
	(1)	(2)	(3)
Age	39.53	41.51	42.30
Female	0.468	0.457	0.457
Years of schooling	10.78	11.27	12.72
Middle school and below	0.358	0.287	0.221
High school	0.240	0.279	0.262
Technical school	0.161	0.119	0.113
3-year college	0.160	0.217	0.253
4-year college and above	0.082	0.098	0.150
SOE and government	0.814	0.612	0.532
No. of obs.	11189	10774	15249

Note: The SOE sector includes state enterprises or joint-owned enterprises with the State being the largest share holder at the central, provincial, or city level.

Table 2. Skilled worker shares, income and income inequality in urban China by province, 1995-2007

	Skilled Worker Share			Average Annual Income 1995 Yuan			Gini Coef.		
	1995	2002	2007	1995	2002	2007	1995	2002	2007
Province	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Beijing*	51.6	47.7	61.2	8457	12044	20348	0.243	0.348	0.365
Shanxi	43.4	44.0	49.9	4822	8132	12405	0.276	0.363	0.325
Liaoning*	39.2	41.0	48.6	5522	9216	11641	0.267	0.353	0.383
Shanghai*			46.8			24490			0.422
Jiangsu*	32.9	36.4	45.4	6742	10350	18986	0.262	0.367	0.446
Zhejiang*			43.7			21990			0.401
Anhui	34.0	41.8	47.0	4900	8250	12779	0.253	0.346	0.338
Fujian*			51.9			15792			0.372
Henan	38.8	42.2	62.6	4737	7746	11973	0.278	0.326	0.313
Hubei	41.3	51.3	55.3	5866	8532	14140	0.246	0.326	0.358
Hunan			53.0			12830			0.351
Guangdong*	36.3	41.2	52.7	11201	17929	26246	0.307	0.376	0.403
Chongqing	42.8	40.3	48.4	4762	9351	12473	0.232	0.340	0.348
Sichuan	41.6	36.9	51.4	5940	8068	12248	0.258	0.361	0.381
Yunnan	45.6	51.7	52.3	5733	9186	11821	0.202	0.301	0.366
Gansu	37.4	43.1	48.7	4604	7641	9807	0.241	0.344	0.371
Total	40.2	43.4	51.6	6209	9772	16173	0.296	0.373	0.413
			(52.4)			(15522)			(0.412)

Note: Skilled labour includes graduates of technical school, professional college (3 year college), and college (4 year) or above. Unskilled labour includes high school graduates or those with degrees below these levels. Columns 1-3 calculate the share of skilled labour only for those with wage incomes. Wages are deflated using provincial level urban CPIs. The price levels for all provinces are normalized to one in 1995. Numbers in parenthesis are calculated excluding observations from the newly added provinces. Coastal provinces are marked with an asterisk "*".

Table 3. Income and income growth for unskilled and skilled workers in urban China by province, 1995-2007

	Unskilled workers					Skilled workers					Income Gap		
	Average Annual Income			Changes		Average Annual Income			Changes		Skilled - Unskilled		
	1995	2002	2007	95-02	02-07	1995	2002	2007	95-02	02-07	1995	2002	2007
Province	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Beijing*	7939	10038	14313	2099	4275	8942	14244	24170	5302	9926	1003	4206	9857
Shanxi	4452	6648	10588	2197	3939	5305	10020	14228	4716	4207	853	3372	3640
Liaoning*	4982	7510	9095	2528	1585	6360	11673	14335	5313	2662	1378	4163	5240
Shanghai*			16551					33508					16957
Jiangsu*	6124	8086	12300	1962	4213	8003	14305	27035	6302	12730	1879	6219	14735
Zhejiang*			15351					30531					15180
Anhui	4469	6711	10669	2242	3958	5736	10394	15164	4658	4770	1267	3683	4495
Fujian*			11831					19470					7639
Henan	4214	6352	9391	2139	3039	5564	9657	13516	4093	3859	1350	3305	4125
Hubei	5346	6902	11574	1556	4672	6606	10077	16218	3471	6141	1260	3175	4644
Hunan			9445					15836					6391
Guangdong*	9700	14583	19141	4883	4558	13841	22707	32613	8866	9906	4141	8124	13472
Chongqing	4114	7129	10126	3014	2998	5630	12642	14971	7012	2329	1516	5513	4845
Sichuan	5391	6314	8579	923	2265	6713	11073	15713	4360	4639	1322	4759	7134
Yunnan	5326	7044	8227	1718	1184	6218	11184	15101	4966	3917	892	4140	6874
Gansu	4230	5868	7276	1637	1409	5230	9978	12469	4748	2491	1000	4110	5193
Total	5621	7859	11903	2238	4044	7083	12270	20172	5187	7902	1462	4411	8269
			(11479)		(3620)			(19192)		(6922)			(7713)

Note: Skilled labour includes graduates of technical school, professional college (3 year college), and college (4 year) or above. Unskilled labour includes high school graduates or those with degrees below these levels. Wages are deflated using provincial level urban CPIs. The price levels for all provinces are normalized to one in 1995. Numbers in parenthesis are calculated excluding observations from the newly added provinces. Coastal provinces are marked with an asterisk "*".

Table 4. Provincial skill premia, return to education, and college premium in urban China, 1995-2007

	Skill Premium			Return to Years of Schooling			College Graduate Premium		
	1995	2002	2007	1995	2002	2007	1995	2002	2007
Province	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Beijing*	0.132	0.249	0.485	0.026	0.059	0.114	0.207	0.414	0.618
Shanxi	0.184	0.340	0.289	0.037	0.059	0.066	0.193	0.315	0.470
Liaoning*	0.319	0.470	0.350	0.048	0.075	0.078	0.333	0.602	0.510
Shanghai*			0.683			0.135			0.895
Jiangsu*	0.170	0.340	0.597	0.034	0.058	0.117	0.057	0.537	0.657
Zhejiang*			0.606			0.114			0.574
Anhui	0.226	0.306	0.244	0.031	0.072	0.053	0.248	0.401	0.345
Fujian*			0.351			0.091			0.442
Henan	0.218	0.263	0.363	0.039	0.056	0.066	0.325	0.445	0.504
Hubei	0.176	0.314	0.326	0.027	0.046	0.080	0.334	0.365	0.499
Hunan			0.340			0.077			0.513
Guangdong*	0.399	0.430	0.466	0.037	0.084	0.117	0.433	0.684	0.700
Chongqing	0.244	0.398	0.354	0.039	0.056	0.066	0.164	0.559	0.587
Sichuan	0.165	0.430	0.440	0.028	0.058	0.089	0.199	0.495	0.640
Yunnan	0.153	0.315	0.480	0.027	0.047	0.090	0.219	0.332	0.566
Gansu	0.277	0.473	0.408	0.039	0.074	0.072	0.367	0.504	0.457
Standard	0.078	0.077	0.123	0.007	0.012	0.024	0.104	0.113	0.127
Deviation			(0.098)			(0.022)			(0.101)

Note: For each province, we run an OLS regression to get the skill premium and the return to education. We also control for experience, experience squared, gender, industry and ownership dummies. In the first three columns, skilled labour includes those with college degrees (3 or 4 years) or above and technical school graduates. Those with high school degrees or below are classified as unskilled workers. Numbers in parenthesis are calculated excluding the newly added provinces. Coastal provinces are marked with an asterisk "*".

Table 5. Explaining the regional variation of the returns to education and skill premia

	Dependent var: return to yrs of schooling			Dependent var: skill premium		
	1995-2007	1995-2002	2002-2007	1995-2007	1995-2002	2002-2007
	(1)	(2)	(3)	(5)	(5)	(6)
EXPGDP	0.030	-0.021	0.152**	0.200	0.072	0.917**
	(0.051)	(0.047)	(0.065)	(0.211)	(0.176)	(0.400)
SOE	-0.170***	-0.134**	-0.172*	-0.643***	-0.340	-0.796
	(0.045)	(0.064)	(0.096)	(0.233)	(0.286)	(0.586)
SKILLED	-0.009	0.007	-0.002	-0.030	0.020	0.052
	(0.028)	(0.032)	(0.063)	(0.147)	(0.160)	(0.292)
EXPER11-20	0.048	0.051	-0.055	0.185	0.185	0.463
	(0.064)	(0.050)	(0.163)	(0.301)	(0.268)	(0.606)
EXPER21-30	0.087	0.080	0.042	-0.037	-0.132	-1.763**
	(0.057)	(0.075)	(0.164)	(0.342)	(0.373)	(0.801)
EXPER31+	0.044	0.059	0.166	-0.219	-0.515	-0.752
	(0.051)	(0.073)	(0.168)	(0.282)	(0.359)	(0.736)
MWAGE	-0.001	0.020	-0.037	-0.508	-0.754	-1.244
	(0.070)	(0.117)	(0.183)	(0.430)	(0.451)	(1.041)
Constant	0.179	0.012	0.118	1.022	0.557	0.745
	(0.251)	(0.301)	(0.521)	(1.319)	(1.512)	(2.381)
R2_wthin	0.420	0.508	0.289	0.353	0.611	0.187
N	99	66	66	99	66	66

Note: *EXPGDP* is the ratio of exports to GDP; *SOE* is the share of the labour force in state owned enterprises or governments. *SKILLED* is the share of skilled labour in the labour force of a city. *EXPER11-20* are the shares of the working population with potential experience ranging from 11 to 20, *EXPER21-30* and *EXPER31+* are defined similarly. *MWAGE* is the average wage level. We run the above regressions using a fixed effects model. *, **, and *** are significance levels at 10%, 5%, and 1% respectively. Standard errors are in parenthesis.

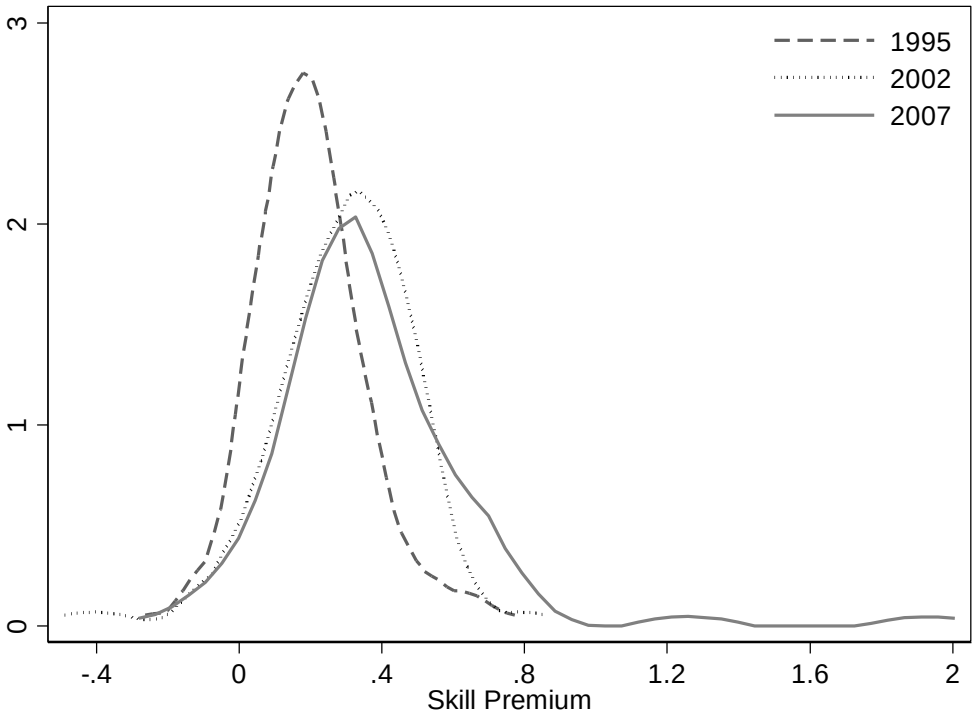
Sources: China Statistic Yearbook and authors calculations from CHIPs.

Table 6. Migrants' propensity to purchase housing and their willingness to settle down and change Hukou

	2005 1% population survey	2012 floating population monitoring data	
	purchase permanent housing (yes=1/no=0)	willing to stay over 5 years (yes=1/no=0)	willing to change Hukou location (yes=1/no=0)
	(1)	(2)	(3)
skilled	0.122***	0.056***	0.060***
	(0.006)	(0.004)	(0.005)
Pseudo R2	0.274	0.080	0.100
N	76934	132623	132684

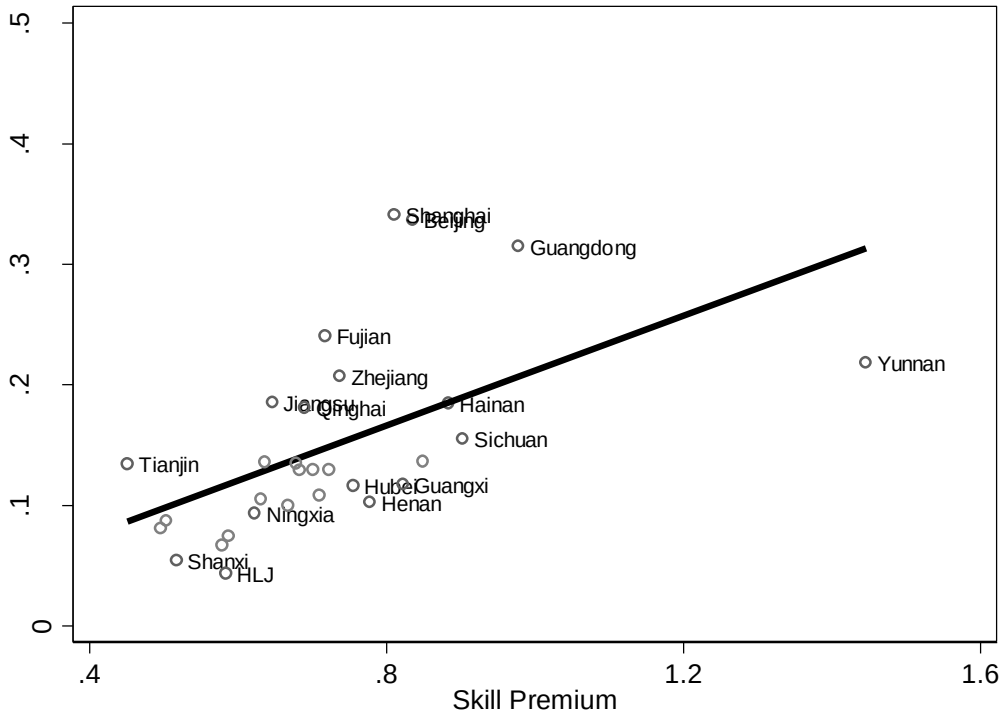
Note: All regressions are run for migrant household head, controlling for cubic age, gender, ethnicity, Hukou status, marital status, quadratic log of monthly income, and city dummies. Column 1 also controls for family size, but columns 2 and 3 do not for the lack of data. The *skilled* are individuals with college degrees (3 or 4 years) or above and technical school graduates. Probit models are estimated and the marginal effects are reported.

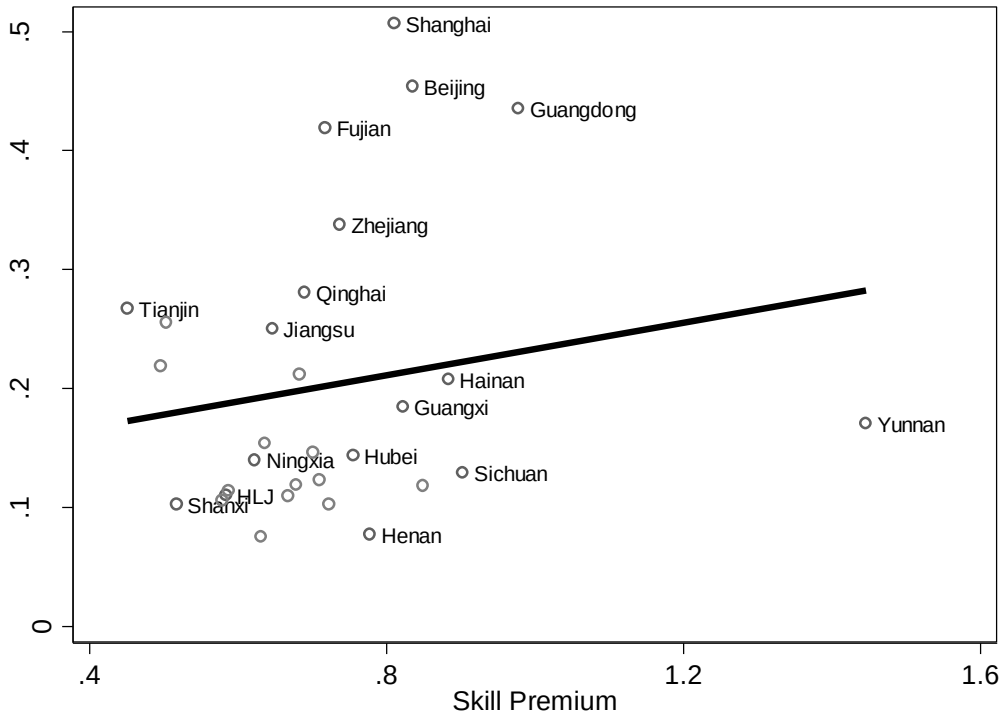
Figure 1. Distribution of skill premia at city level



Note: The skill premia are obtained by estimating wage equation for each city. There are 62, 61, and 91 cities for 1995, 2002, and 2007. The kernel density for each year is estimated using the Epanechnikov kernel function, bandwidth is set at 0.08, and each city is treated equally without using city population or employment as weight.

Figure 2. The relationship between skill premia and migrant shares of skilled and unskilled workers

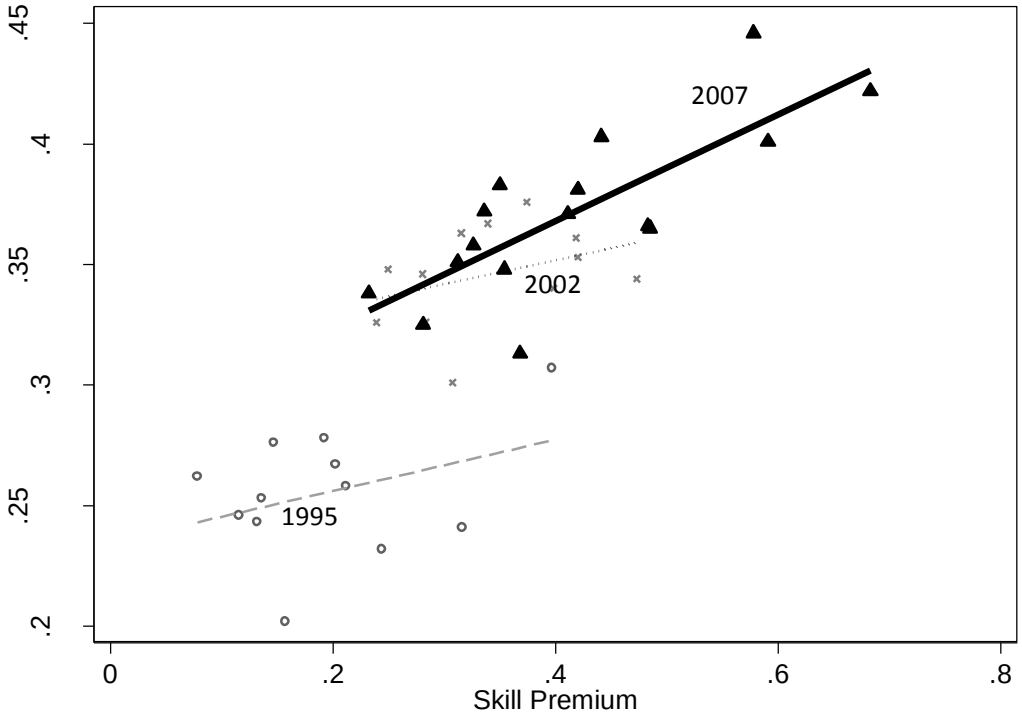




Note: We regress log of wage on a skill dummy to get the skill premium for each province, controlling for age, age squared, and gender. Wages are deflated using provincial level urban CPIs. The price levels for all provinces are normalized to one in 1995. Skilled workers are those with a degree higher than high school and with positive wage income. Migrants are those who have left their Hukou registration location and work in another city more than half a year.

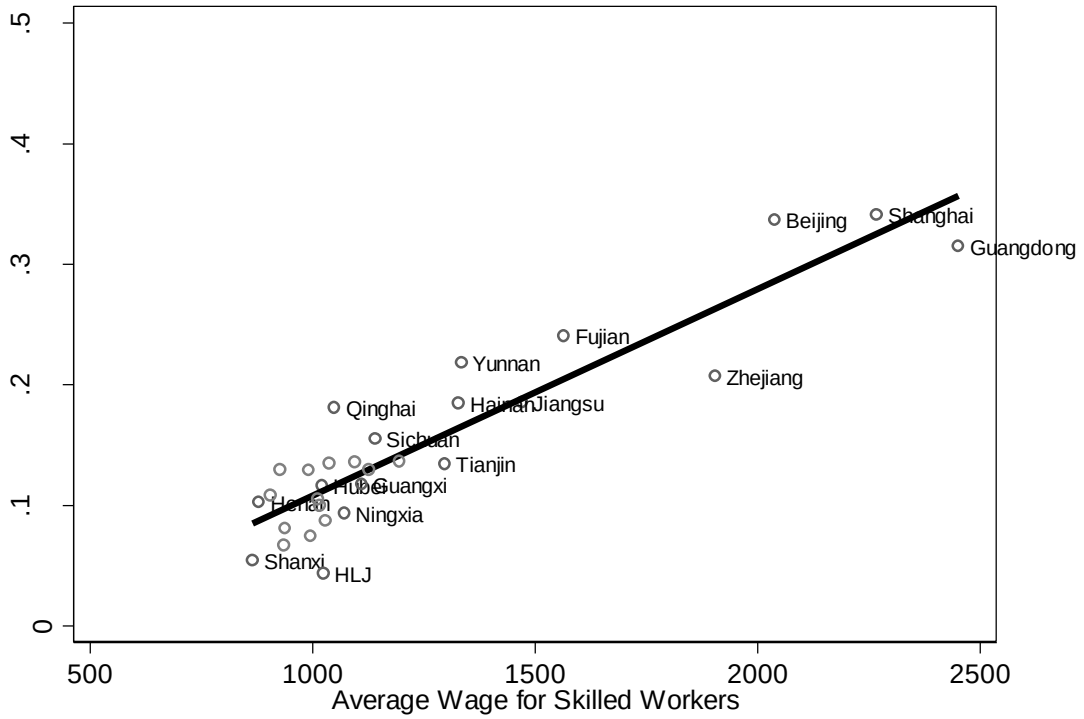
Sources: One percent population survey for 2005, China Statistic Yearbook 1997-2006.

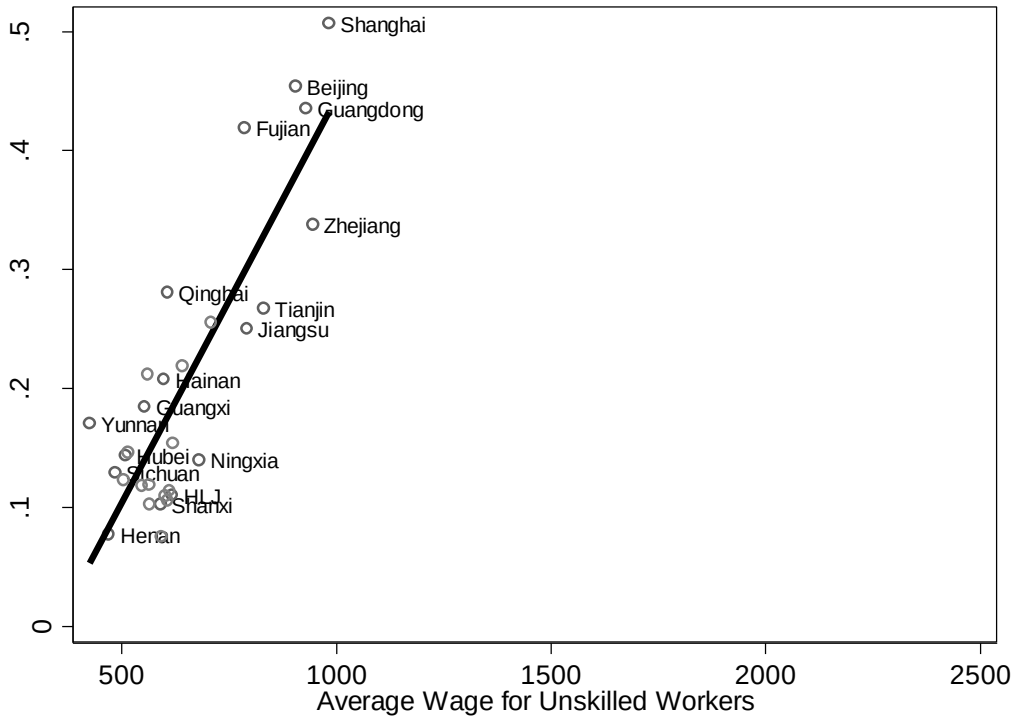
Figure 3. The relationship between skill premia and within province inequality



Note: The skill premium for each province is estimated according to model (1) using data from CHIP 1995, 2002, and 2007. Regressing Gini coefficients at the provincial level against skill premium, the coefficients on skill premium are 0.107(0.086), 0.100(0.082), and 0.221(0.047) for 1995, 2002, and 2007, respectively. The adjusted R-squared are 0.046, 0.041, and 0.582, respectively. The numbers of observations are 12, 12, and 16.

Figure 4. The relationship between real wages and migrant shares of skilled and unskilled workers





Note: Wages are deflated using provincial level urban CPIs. The price levels for all provinces are normalized to one in 1995. Skilled workers are those having degrees higher than high school graduates and with positive wage income. Migrants are those who have left their Hukou registration location and work in another city more than half a year.

Sources: One percent population survey for 2005, China Statistic Yearbook 1997-2006.