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The Educational Success of China's Young Generation of Rural-to-Urban Migrants

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Abstract

The education policies introduced in the rural areas of China following the end of the 'cultural revolution' resulted in an improved provision of educational institutions along with better quality teachers which increased the educational attainment of young rural migrants and raised their career aspirations. This paper uses data from the Rural-Urban Migration in China (RUMiC) dataset for 2009, in a novel examination of the wage returns to schooling for young and old generations of rural-migrant and urban workers in order to ascertain whether the improved schooling has led to better outcomes. Another novel feature is the examination of the wage returns to over-, required and under-education. We find evidence that the wage return to schooling for young rural-to-urban migrants is larger than that for older migrant workers and that the return to schooling for young urban residents is lower than that of older workers. There is evidence of young migrants receiving a wage premium where they are overeducated for their job.

JEL: I26; J24; J71.

KEYWORDS: Human Capital; Rural-to-Urban Migration; Discrimination; Wage returns.

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1. Introduction

The extremely large rates of economic growth in China over the past thirty years has been well documented (World Bank 2015). China has accomplished its high rate of economic growth with the aid of rural-to-urban migrants, a group of individuals who have relocated from rural areas to the cities, and who have increased the productivity of the labour-force over the past three decades (Zhang and Song, 2003; Wang et al., 2013; Liang et al., 2014; Li and Freeman, 2015). China's urbanization policies have allowed some 260 million rural migrants to move from agriculture to more productive activities (World Bank et al., 2014). The large increase in rural-to-urban migration is demonstrated in figure 1, where it can be seen that there were steady yearly increases in migration from 1988 to 1998 and then a series of larger increases thereafter. More recently, the increase in migration has slowed.

FIGURE 1 HERE

A key motivation for rural residents in China to migrate to the cities has been the higher wage rates that are available to city workers, compared to those available in rural areas. Zhang and Song (2003) find the direction of causality to run from economic growth to migration, implying that it is the economic incentive from growth which attracts rural migrants to the cities. The higher wage rates in the cities have led to wide rural-urban income inequality (Shorrocks and Wan, 2005; De Brauw and Rozelle, 2008), which is also a common feature in many other developing countries. The income disparity in China, both across regions and more recently within cities, has been exacerbated by the household registration system, or '*hukou*', which has meant that rural-migrants have been denied access to public services such as housing, social services and health services. The hukou system was established in the cities in 1951 and extended to rural areas in 1955 in order to control internal migration. Consisting

of two parts; the residential location, i.e. whether rural or urban, and the socioeconomic eligibility, i.e. whether agricultural or non-agricultural (Chan and Zhang 1999), the hukou system has naturally restricted rural-to-rural and urban-to-urban migration (Zhao 2004). However, since the start of the millennium, and following the relaxation of some of the regulations of the hukou, including the introduction of two special types of residential registration (Liu, 2005), China's urban labour markets have witnessed a phenomenal influx of rural-migrants. These migrants are on average more educated than their predecessors, although less educated than urban workers, and arguably, they have migrated in search of long-term economic benefits from their education in order to seek successful lifetime careers rather than short-term gains from higher wages. Young migrant workers' skills and abilities should be rewarded in the labour market with job opportunities appropriate for their abilities and remuneration packages equal to those of urban residents i.e. without discrimination from a system introduced during a completely different political and cultural era.

In this paper we examine the changes that have occurred in the educational system and in the labour market in China since the end of the Mao era. We examine the return to education for both urban residents and rural-to-urban migrants and following our argument concerning the differences in the young and older generations of migrant workers, a novel feature of this paper is that we focus on the difference in wage returns to schooling for these two groups. Given the higher average level of education held by younger rural migrants compared to older migrants, we hypothesise that this leads to a higher probability of the former group being over-educated for their occupation, especially so as discrimination from the hukou system is still faced by all migrants. To investigate this possibility, another novel feature of this paper is that we examine the over- and under-education of young and old generations of rural-to-urban migrants and urban workers, which extends the current economic literature on migrants in China.

We proceed by providing some background of the educational system and the labour market faced by migrants over time in China in the following section, in order to explain the large difference in educational opportunities between the generations of migrants and we review the current literature. In section 3 our data and econometric methodology are discussed. In section 4 we discuss our results and we draw our conclusions in section 5.

2. Background

2.1. The Education system in China

The current Chinese educational system is similar in nature to the US, with six years of primary education, six years middle school followed by tertiary education, which may be between 2-4 years depending on whether the course is academic or vocational in nature and then postgraduate study (Treiman, 2013). However, the Chinese education system has undergone major upheaval over time which affected the educational opportunities and attainment of individuals, especially for those residing in rural areas. In particular, Chairman Mao's '*Cultural Revolution*' between 1966 and 1976, caused massive disruption to the education of young people in rural area. At this time many new schools opened in rural provinces with poor quality teachers, hired on their political attitude rather than their quality (Treiman, 2013). In tandem with Mao's schools policy, the introduction of the '*family responsibility system*' in the rural areas meant that farmers were now allowed to sell surplus grain on the open market, which meant that the opportunity cost of children being in school rose sharply because they could be more productive working on the family farm (Tsui, 1997). Hence, the average education of rural residents was far below that of urban residents. After 1977, the schools plan of the '*Cultural Revolution'* was reversed and schools policy focussed on hiring quality teachers and promoting a good education. Tertiary education expanded rapidly from 1999 following the Chinese Ministry of Education's '*Action Plan of Education*

Promotion for the 21st Century', in 1998, alongside the Chinese government's Plan for '*Revitalizing Education in the Twenty-First Century*' (Wan, 2006; Yeung, 2012; Treiman, 2013). Figures show that between 1999 and 2011 there was a fourfold increase in the number of young people in higher education, from 1.55 million to 6.82 million (China Statistical database). Given the extreme changes to the education system in China, especially in the rural areas, it is evident why younger workers, the 'new generation' of migrant workers, are considered to be more educated than the 'old generation'.

2.2 The Labour market in China

Typically, before the start of the start of the new millennium, rural-to-urban migrant workers were strictly restricted to low skilled, low status and low-paying jobs or those referred to as '*3D*' jobs (dirty, dangerous and demanding), which would not require a high level of education (Meng and Zhang, 2001). Early labour policies which encouraged migrants to the cities largely ignored the problems faced by migrants due to the restrictions of the hukou, which meant that employers took advantage of the temporary contract rural-to-urban migrants. Many local governments required urban business firms, both state owned and privately owned, to hire permanent staff only from local residents (Liu, 2005).

Since the new millennium the Chinese government has recognised the economic benefits to be gained from more-educated workers and has introduced new labour policies. For example, in January 2008 China's new *Labour Contract Law* came into effect which protected migrant workers' rights, including the right to a labour contract, social insurance and minimum wages (see Li and Freeman 2015, for an assessment of the effect of this Law on China's rural-urban migrant population). Urbanisation policy was introduced in 2001 to guide rural migrants to work in small and medium towns (usually close to their home) rather than in large cities like Beijing and Shanghai. Several policies and initiatives were put into

place, such as the *Spring Wind Action Program* in 2008 that encouraged rural migrants to work in their local provinces or small cities rather than relocating to the larger cities. Additionally, the local government authorities' budgets in the local provinces were increased in to enable them to finance retraining programmes for return migrants to improve their skill levels (Wang et al., 2013). However, the so-called new-generation of migrant workers are "not familiar with farming and are dying to be part of the city life" (Cao and Lin, 2010). Recently, China's large economic growth, whilst still large when compared to developed nations such as the UK or the USA, has shown evidence of a slowdown, falling to 6.8% in the fourth quarter of 2015 (Wall Street Journal, 19 January, 2016). The provision of a high-quality education for all Chinese citizens, whether urban or rural residents, and their subsequent assignment to employment which matches their ability, along with further on-the-job-training is paramount for sustained economic growth in China. As China's urbanization program expands, greater numbers of highly-educated young talent are required to meet the demands of a fast-growing and technically biased labour market.

2.3 Literature

Previous research has found that the returns to education in urban china are larger than those in rural China as we would expect given the economic growth in these areas, and typically the return to education in urban areas has been found to be increasing over time (Zhang et al., 2005; Ren and Miller, 2012). Ren and Miller (2012) calculate the difference in the wage returns to schooling in rural areas of China between males and females using the 'Over-Required-Under educated' (ORU) framework of Chiswick and Miller (2008), which considers the mean level of education for each occupation category as that required for the job. They also use the decomposition analysis of Chiswick and Miller (2008) and find that there is a greater return to possessing the required education for a job for females compared

to males (9.35 percent and 6.35 percent, respectively), which they attribute to the self-selection of highly motivated females into the labour market. Zhu (2016) using the China Household Income Project (CHIP) dataset finds the return to a year of schooling in 2007 for urban resident workers and migrant workers to be 4.9% and 4.2%, respectively. Additionally, Zhu (2016) finds wage differentials between urban residents and rural migrants to be greatest at the top end of the wage distribution. This could be a possibility for older workers due to the effect of the disrupted education system outlined above; the difference in the quality of schooling in the rural and urban area in China at this time is recognised (Heckman and Li, 2004; Fu and Ren, 2010). However, young rural migrants, compared to their elders, have had a better quality of education and are more likely than their elders to enter higher education in an attempt to improve themselves. We can assume that rural-migrant workers in China received their education in their home area before migrating because due the hukou system it is extremely difficult for migrants' children to be allowed to attend schools in urban areas (Demurger and Xu, 2013).

Despite their higher education level and aspirations rural-migrants are still discriminated against by the hukou system in that they are often restricted to occupations below their education level despite choosing to migrate in order to pursue their career and develop new skills (Wang 2008). Furthermore, job search in China is not as straightforward as in many other countries because many workers obtain their job in the urban area through introductions by family members (Wang, 2008; De Brauw and Giles, 2008; Liu et al., 2012). The hukou system's discriminatory nature, providing no housing or social services for migrants means that they must have a job and means of support on arrival in the city, which it is argued interferes with the job search process, interrupting the efficient allocation of migrant workers to jobs (Meng, 2000). This would explain why we often find rural-to-urban workers in temporary employment as they

move around and switch jobs in an attempt to support themselves' whilst they seek a job to match with their skills (Zhao, 2004).

The average growth rate of GDP in China has been over 9% annually since 1999, but the growth of the education expansion has been approximately 22% annually (China Statistical Database), implying that new entrants into the labour market have had difficulty in obtaining a job with the same relative salary and working conditions as their elders who held the same qualification. We examine the wage effects from over-education and under-education for urban Chinese and for Chinese rural-to-urban migrants. We argue that over-education wage penalties will exist for both groups of individuals but that the wage penalties will be greater for rural-to urban migrants due in large part to the discrimination faced from the hukou system. Additionally, we hypothesise that young rural-urban migrants, whom we term the '*young generation*', (that is those aged below 35 and therefore would have started school during this education system, after the end of the '*Cultural revolution*' who are more likely to be over-educated for their job than their older counterparts, who spent relatively less time in education and who faced education of a poorer quality (Treiman, 2013).

3. Data and Methodology

3.1 Data

The dataset used here is the 2009 Rural-Urban Migration in China (RUMiC), which is a set of regional surveys conducted jointly by the Australian National University, the University of Queensland and the Beijing Normal University and supported by the Institute for the Study of Labour (IZA) in Bonn. The 2009 survey is the most recent and comprehensive dataset that focuses on migrant workers in China. The data consists of three separate surveys of which we use two: the Urban Household Survey (UHS) and the Migrant Household Survey (MHS). The

RUMiC is the ideal dataset for our purpose as it contains rich demographic, educational and employment information on urban, rural and migrant workers of all working ages. By contrast, the China Health and Retirement study (CHARLs) dataset contains only individuals aged 45 and over, and the China Household Income Project survey (CHIP) dataset does not include migrant workers[2]. The separate surveys use identical questionnaires which enables an economic analysis of each sample in isolation and together. The motivation for analysing the separate samples as well as taking them together is that we can see the return to education for each group given that, as discussed, the quality of education provided may be different or viewed differently by urban employers. In most studies of rural-to-urban migrants it is assumed that years of education are equal across areas and over time, which may not be the case here. The data for each sample consists of the usual demographic questions, personal characteristics, employment type and firm characteristics, along with questions about householder's education. Descriptive statistics for the samples we utilise are provided in Table 1.

TABLE 1 HERE

For our analysis of over-education we make use of the question:

"How many years of formal education have you had (Excluding skipping or failing a grade)?"

Our measure of over-education (under-education) is defined as one standard deviation or greater (lower) than the mean education level found in their occupation[3]. The survey asks the householder for their highest level of education, which we were able to cross-check with their

[2] The advantages of the RUMiC over other datasets; the Chinese Household Income Project (CHIP) and the China Health and Retirement Longitudinal Study (CHARLS) is detailed in Akgüç et al (2013).

[3] Most of those who matriculate also graduate which means that it is possible to use years of schooling to infer educational level (Treiman 2013).

reported years of schooling. The average years of schooling and qualifications for each of the samples are provided in Table 2. The educational level attained is always greater for the urban sample than the migrant sample across both age groups, as we expected.

TABLE 2 HERE

However, we can also see from Table 2 that the average years of schooling has increased for the younger age group in both urban and migrant samples, although consistently we find that the average education of migrant workers is lower than that of urban workers. If we consider the professions that the individuals in our samples enter, shown in panel A of Table 3, we can see that the majority of rural to urban migrants (just less than 45%) enter into the commercial and service industries. Across all occupational categories migrants are seen to have a lower average of years of education than urban workers.

TABLE 3 HERE

Less than a quarter of our migrant sample is found in the clerk or personnel occupations and most of the remaining individuals enter into the manufacturing sector. As discussed above, migrants are highly unlikely to be found in professional occupations in the cities, possibly because of the larger proportion of migrants compared to urban residents who have lower than average years of education, especially among the older generation, and partly because of the discriminatory nature of the hukou system. Panel B of Table 3 reveals that for each of our samples, the average years of education in each occupation category is always greater for the new generation compared to the older generation of workers. Examining the average hourly wage by industry, shown in Table 4, we can see that urban residents earn more on average than migrants in every industry classification. The difference is most pronounced in the primary industry, where there are few migrants and also in the financial services and business related sector and public service sector; industries where in the past, migrants had difficulty

in entering due to their hukou status but which younger, more educated young migrants have greater access to.

TABLE 4 HERE

Finally, we can see the proportions of young and old generation workers across our samples in Table 5. Here we see that in the full sample we have a pretty even split of young and old workers, however, there is a difference in the proportion of young and old across the urban and rural samples. In the urban sample the older generation of workers account for around seventy percent of the workforce whereas the opposite is true for the rural-to urban migrants. We believe that the larger proportion of young migrant workers compared to older migrant workers is likely to be due to several factors; firstly, the older generation were not as well-educated as the younger generation and therefore, less likely to enter permanent or long-tenure jobs; secondly, the hukou system meant that housing costs were high and with no health insurance or social support many rural migrants eventually returned home.[4]

3.2 Methodology

The theory that underpins our economic analysis of the returns to education and to over and under-education in the Chinese labour market is that of Human Capital (Becker 1964). Two estimation methods are used to examine the returns to education for both native urban residents and rural-to urban migrant workers. First, a Mincerian earnings function is estimated separately for each of our samples, which provides the wage returns to schooling among urban native workers, rural-to-urban migrant workers, and then estimated together. By estimating OLS for each sample we seek to examine whether there are differences in the

[4] For literature on the return migration in China see (Zhao, 2002; Dustmann, 2003).

estimated return to years of schooling for migrants between the migrant and full sample. The estimating equation is given as:

$$Y_i = \alpha_0 + \beta_0 S_i + \beta_k X_{ik} + \varepsilon_i \quad (1)$$

where Y_i is the logged deflated gross hourly wage. S_i is the completed years of schooling, and X_{ik} is a vector of k control variables that are known to influence earnings, including personal characteristics (age, age squared, male, married), and job characteristics (industry, firm ownership, firm size and job type) and province. We include tenure in the job and its square as an attempt to capture experience in the position and which we would expect to have a positive effect on the wage and also a young dummy variable to capture any difference across the generations. We hypothesise that the young generation, working in a growing economy are more likely to receive greater wage returns. In order to ascertain whether the wage returns to schooling are different between older and younger workers, especially since there have been many reforms to the education system in China and especially so in the rural areas, we re-estimate our equation and include interaction terms between years of schooling and being young (defined here as aged below 35).

Our second estimation strategy is to examine the returns to over-education and under-education. As stated in the data section above, we measure the incidence of over-education (under-education) in each of our samples using the realised match method (Hartog, 2000) and calculate the mean level of education as the mean number of years of education within each occupation category. For each sample we estimate the 'over-required, required and over-required' (ORU) specification (Duncan and Hoffman, 1981; Hartog, 2000; Lenton, 2012), where required education is measured as the mean years of education found within each occupation. The earnings equation is given as:

$$Y_i = \beta_k X_{ik} + \gamma_1 S^R + \gamma_2 S^O + \gamma_3 S^U + \varepsilon_i \quad (2)$$

For our full sample we include a dummy variable to capture whether the respondent is a migrant worker. Here again we estimate models which include interaction terms between being young and either with the required education, being overeducated or being undereducated to ascertain if there are any significant differences between the young and older workers. Our 3 samples, urban, migrant and full sample contain wage information from the urban labour market but as discussed above, these two groups, it is argued faced different education systems, especially the older generation of migrants. The realised-matches method of measuring the incidence of over-education we utilise here uses the mean level of education of individuals within an occupation and therefore is naturally sensitive to the sample of individuals. For this reason we make use of separate measures, for each of our samples. In this way we can examine whether an urban individual is over- or under-educated compared to their comparison group of urban residents. The same rationale is applied for the migrant sample and finally, examining the full sample enables us to see the difference between the groups where the migrant group are faced with discrimination from the hukou system.

4. Results

The results from our earnings equations are shown in Table 6. The return to a year of schooling in our full sample is found to be 5.2%. However, the return is larger for urban residents at 5.6% compared to 3.1% for rural migrants; these wage returns are similar to those found by Zhu (2016) who analysed 2007 CHIP data. In both of our separate samples (columns 2 and 3) we find similarities across covariates, for example, experience (proxied here by tenure), working in a large firm with over 100 employees, and on a permanent or long-term contract increases the wage return. The wage return is largest in Guangdong province as demonstrated by the negative coefficients on all province dummy variables. In our full sample (column 1) however, we see a huge negative effect on the wage return from

being a rural migrant, which implies that migrants face a 22% wage penalty compared to urban residents. We consider that this huge wage penalty is due in large part to the discriminating effects of the hukou system. Despite efforts by the Chinese government to relax some of the restrictions forced upon rural-migrants from the hukou system (Chan 2009) it is clear that wide-ranging discrimination remains. As we have seen in Table 3, urban residents are more likely than rural residents to be found in the top occupations. With respect to our 'young' dummy we find that being aged below 35 years old increases the wage return for migrants, yet it is insignificant for urban workers (Table 6 columns 2 and 3). This variable is also significantly positive for our full sample (column 1). We hypothesise that young migrant workers have benefitted from the relaxation of some of the restrictions of the hukou system[5], and are more likely to enter better quality jobs and receive a higher wage return to their education than their older counterparts who had the same level of education. To investigate this hypothesis we re-estimate the wage equation for all samples including an interaction term for schooling and young. The results for our variables of interest[6] are reported in Table 7, where our results support our hypothesis that the wage return to schooling is greater for young rural migrants than for older migrants. The wage return to schooling for migrants is just above 2 percent but this increases by around a further 2 percentage points for each year of schooling a young rural migrant possesses, results which are highly statistically significant. Furthermore, for urban residents we now see a significant wage premium for being young but the interaction with schooling implies a reduction in the wage to schooling for the young generation compared to the older generation. This result is highly statistically significant and a novel finding in the literature. We speculate that the

[5] From 1979 to 1997 the non-agricultural hukou population grew at an average of 7.8 million per year, or 3.7%, compared to an average of 2.5 million or 1.9% per year in the period between 1963 and 1978 (Chan and Zhang, 1999).

[6] All coefficients on the other independent variables did not change from those reported in Table 6. The full set of results is available from the authors on request.

increase in young educated rural migrants competing in the urban labour market has increased the supply of productive workers leading to a slight fall in the wage return for young urban residents.

We now turn to the results from our ORU equation (equation 2), which shown in Table 8. The results for the full sample (in column 1) conform to the predictions for the ORU model (Duncan and Hoffman, 1981) in that the wage return is greatest for those who are in a matched job with the required education level. The returns to over-education are also positive and statistically significant although below those of those with the required education and the returns to under-education are statistically significant and negative. Our young generation of workers, as we predict, have a positive wage coefficient. However, there is a large negative and statistically significant coefficient on the dummy variable for migrant workers; once again we believe that this strong result implies that there is still a large amount of discrimination against rural-migrant workers. The problems associated with the hukou system leading to migrants being forced to take temporary jobs to support themselves', has been claimed to be a large part of the explanation for wage inequality (Zhao 2004), but we have controlled for temporary jobs (short term) in our estimation strategy. In Western labour markets this explanation for a mismatch between workers and their job would imply that the over-education of migrant workers is merely transitory whilst they seek a job that matches with their education level. However, given the apparent high level of discrimination against rural-migrant workers in China this over-education may be more permanent. Indeed, our findings suggest that being over-educated for one's job may be the 'norm' for young migrant workers.

Turning to the results from our urban sample (column 2) we see that our results here also conform to the results found in the ORU literature (Duncan and Hoffman, 1981), with urban residents enjoying the greatest wage return where they possess the required education for

their job. The coefficient shows that urban residents who possess the required schooling for their job earn an extremely large wage premium of around 15%. There is a small but positive return to over-education of around 3% and a wage penalty to being under-educated of around 4%. The young generation of urban workers earn a wage premium of around 7% compared to their older counterparts which, we believe may be due to the more favourable labour market conditions and economic climate faced by the young generation at the time they entered the labour market. The tenure of the current job which captures experience also reveals a positive wage premium of around 3%.

The results of our ORU model for migrants (Table 8, column 3), reveals a departure from the usual results found in the literature for this model. Here migrant workers have a small significant return to possessing the required education for their job, however, there is a larger statistically significant return of around 4% where the migrant worker is overeducated. We believe this positive finding implies that only the rural migrants who have the greatest years of schooling, and who are most likely to be of high ability, are successful in the urban labour market compared to their peers. The coefficient on young shows a wage premium of around 14% compared to their older counterparts and we believe this is driven by their better quality of education. There is also a negative effect from being under-educated which is significant and confirms to the literature. Similar to the urban and full samples, the positive wage effects from being male, experience in the job and being employed in a large firm are present.

Finally we turn to the results of our interactions of young with over- required- and under-education which are reported in Table 9. We find statistically significant results which imply that correctly matched young urban workers (column 2) receive a return of around 3% less than their correctly matched elders, whilst correctly matched young migrant workers (column 3) receive a return of around 7% more than their correctly matched elders. These results accord with our earlier results from the wage equation (equation 1), suggesting the robustness

of these findings. We suggest that younger workers may be required to possess a higher level of education to cope with the higher level of technological change as China has grown economically and suggest this is an area for further research.

5. Conclusions

This paper has investigated the wage returns to urban residents and rural-to-urban migrants in China. A novel feature of this analysis is that we consider the difference between the young generation, whom we class as aged 34 or below and the older generation. We consider the quantity, and indirectly the quality of education undertaken by the two generations of rural migrants as there are major differences between the two. The young generation of rural migrants have more education and are more likely to be found in better quality jobs than their older counterparts. China, like all nations, is dependent on a well-educated highly skilled labour force for continued economic growth. We have found evidence that the wage-return to schooling has shown a small but significant increase for the young generation of migrants compared to their older counterparts and whereas there is a slight fall in the wage return to schooling for young urban residents compared to their older counterparts. However, whilst the average educational quality, of young rural-migrants is higher than that of their older counterparts we find evidence suggestive of large discrimination effects against migrants, which we believe is from the hukou system. In spite of the Chinese government's efforts to encourage migration by relaxing some of the restrictions of the hukou system faced by migrants (Chan, 2009), which has seen a rise in internal migration since the turn of the millennium, it appears that the transition to the urban labour market is still problematic for these workers. The hukou in an economic sense acts as an administrative barrier to work (World Bank et al., 2014). Finally, we have examined the over- under- and required education of both urban residents and migrants. In our migrant sample, it appears that there

are larger positive wage returns to being over-educated than correctly educated. However, interaction terms show there is a large premium to being a young migrant and possessing the correct education for the job compared to the correctly matched older generation. The urban sample, however, reveals a slight fall in the wage return to possessing the correct education for the job for young people compared to the correctly educated older generation. These results are strongly indicative of the educational success of young migrant workers, who are catching up with their urban counterparts in the urban Labour market. If China is to sustain its level of economic growth it needs to ensure there are no barriers to mobility across urban areas and to ensure that skilled workers are able to obtain permanent jobs which match with their skills. Furthermore, all able workers, not just urban residents, should be able to access permanent employment that provides on-the-job training. Young Migrant workers, we argue, are vital for China's economic growth. By promoting competency-based technical and vocational education and training and reforming the tertiary education system to focus on increasing the labour market relevance of higher education would bring positive returns (World Bank et al., 2014).

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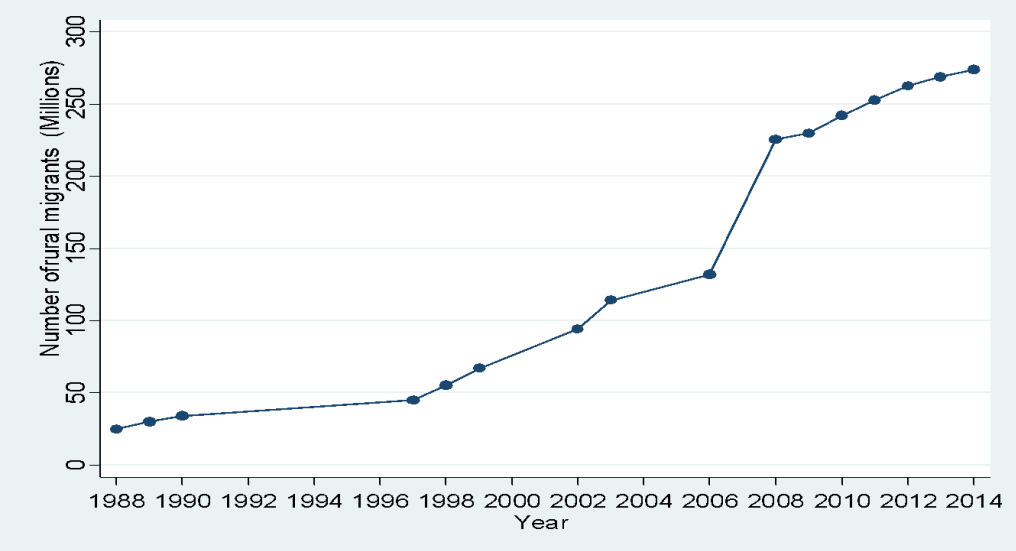
Figure1. The increase in the number of rural to urban migrants in China.



Source: Year 1988 (Meng and Zhang, 2001); Year 1990 (Mangnani and Zhu, 2012); Year 1989 and 2006 (Zhu, 2016); Year 1997, 1998 and 1999 (Ping and Pieke, 2003); Year 2002 and 2003 (Shaohua, 2005) and Year 2008 to 2014 (National Bureau of Statistics, China).

Table 1: Descriptive statistics.

	Full sample		Urban sample		Migrants sample	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Log hourly wage	2.292	0.725	2.517	0.739	1.892	0.490
Years of schooling	11.387	3.465	12.505	3.253	9.400	2.892
Over-educated	0.116	0.320	0.107	0.309	0.118	0.323
Under-educated	0.112	0.315	0.125	0.331	0.130	0.336
Years of required education	11.387	1.502	12.505	1.229	9.400	0.499
Years of over-education	0.600	1.858	0.554	1.879	0.511	1.461
Years of under-education	0.589	1.790	0.575	1.601	0.671	1.916
Age	36.709	11.068	40.487	9.754	29.992	10.034
Age square	1470.04	836.748	1734.296	792.810	1000.17	694.722
Young (age<35 years old)	0.447	0.497	0.305	0.460	0.698	0.459
Male	0.571	0.495	0.559	0.497	0.592	0.491
Married	0.715	0.451	0.836	0.370	0.501	0.500
Minority	0.989	0.105	0.990	0.098	0.986	0.117
Tenure of current job	9.421	10.210	13.002	10.891	3.053	3.919
Tenure square	192.983	338.998	287.643	389.373	24.670	73.695
Migrants dummy	0.360	0.480				
Industry						
Agriculture, forestry and related	0.005	0.070	0.007	0.086	0.001	0.025
Manufacture, production and construction	0.301	0.459	0.261	0.439	0.371	0.483
Information Transmission and Transportation	0.101	0.301	0.137	0.344	0.035	0.184
Finance and Business	0.088	0.284	0.095	0.293	0.076	0.265
Public	0.194	0.396	0.259	0.438	0.080	0.271
Services	0.311	0.463	0.240	0.427	0.437	0.496
Occupation						
Principals in State Agencies, enterprises and public service	0.039	0.193	0.059	0.235	0.004	0.060
Professional technicians	0.156	0.363	0.242	0.428	0.004	0.062
Clerk and relating personnel	0.260	0.439	0.268	0.443	0.246	0.431
Commercial and service personnel	0.290	0.454	0.205	0.404	0.442	0.497
Manufacturing and transport related	0.209	0.407	0.157	0.363	0.304	0.460
Agriculture, Soldier and others	0.045	0.208	0.070	0.255	0.001	0.035
Ownership						
State enterprise	0.471	0.499	0.649	0.477	0.156	0.363
Firm size						
Firm size 1(1 to 5 employees)	0.067	0.250	0.049	0.216	0.099	0.298
Firm size 2 (6 to 20 employees)	0.183	0.387	0.169	0.375	0.207	0.405
Firm size 3 (21 to 99 employees)	0.299	0.458	0.287	0.452	0.320	0.467
Firm size 4 (100 and over employees)	0.451	0.498	0.495	0.500	0.374	0.484
Job type						
Permanent	0.267	0.443	0.340	0.474	0.138	0.345
Long term	0.471	0.499	0.500	0.500	0.420	0.494
Short term	0.072	0.258	0.042	0.201	0.124	0.330
Other	0.188	0.391	0.115	0.319	0.318	0.466
Province						
Guangdong	0.181	0.385	0.152	0.359	0.232	0.422
Henan	0.097	0.297	0.113	0.317	0.069	0.254
Anhui	0.099	0.299	0.110	0.313	0.081	0.273
Chongqing	0.080	0.272	0.079	0.270	0.083	0.275
Shanghai	0.108	0.310	0.124	0.329	0.079	0.270
Jiangsu	0.124	0.329	0.112	0.315	0.145	0.352
Zhejiang	0.124	0.329	0.109	0.311	0.151	0.358
Hubei	0.082	0.275	0.084	0.277	0.080	0.271
Sichuan	0.104	0.306	0.118	0.322	0.080	0.272
Total	9251		5921		3330	

Table 2: Average years of schooling and highest educational level.

Variables	Full sample	Urban sample	Migrant sample
Average years of schooling	11.387	12.505	9.400
Average years of schooling (young)16-34 years old	11.900	14.254	10.072
Average years of schooling (old) 35- 60 years old	10.974	11.739	7.842
Highest educational level			
Primary or less	512 (5.53%)	112 (1.89%)	400 (12.01%)
Junior middle school	2567 (27.75%)	947(15.99%)	1620 (48.65%)
Senior middle school	2152 (23.26%)	1491 (25.18%)	661 (19.85%)
Vocational school	1032 (11.16%)	626 (10.57%)	406 (12.19%)
College/Undergraduate or higher	2988 (32.30%)	2745 (46.36%)	243 (7.30%)
Total	9251	5921	3330

Table 3: Mean years of education by occupation for each sample and each generation.

Panel A	**Full sample**		**Urban sample**		**Migrant sample**	
Occupation	N	Mean years Education	N	Mean years Education	N	Mean years Education
Principals in State Agencies, Party organisations	359 (3.88%)	13.80	347 (5.86%)	13.95	12 (0.36%)	9.25
Professional technicians	1446 (15.63%)	13.98	1433 (24.20%)	13.99	13 (0.39%)	13.15
Clerk and relating personnel	2403 (25.98%)	12.01	1585 (26.77%)	12.99	818 (24.56%)	10.12
Commercial and service personnel	2686 (29.03%)	10.24	1214 (20.50%)	11.40	1472 (44.20%)	9.28
Manufacturing and transporting equipment	1938 (20.95%)	9.85	927 (15.66%)	10.82	1011 (30.36%)	8.96
Agriculture, Solider and Other	419 (4.53%)	11.28	415 (7.01%)	11.31	4 (0.12%)	8.25
Total	9251	11.39	5921	12.51	3330	9.40
Panel B: Mean years of education by generation						
	Old	Young	Old	Young	Old	Young
Principals in State Agencies	13.56	14.89	13.67	15.40	8.50	10.00
Professional technicians	13.32	15.15	13.32	15.19	13.25	13.11
Clerk and relating personnel	11.50	12.60	12.10	14.74	8.73	10.66
Commercial and service personnel	9.43	10.88	10.44	13.27	7.34	9.97
Manufacturing and transport	9.52	10.30	10.40	12.58	7.75	9.66
Agriculture, Solider and Other	10.55	13.30	10.57	13.36	6.50	10.00
Total	10.97	11.90	11.74	14.25	7.84	10.72

Table 4: Average hourly wages, in yuan, by industry.

Broad sectors	**Full sample**		**Urban sample**		**Migrant sample**	
	wage	Freq %	wage	Freq %	wage	Freq %
First Industry	25.667	0.50	26.540	0.74	6.473	0.06
Second Industry	12.506	30.09	15.976	26.13	8.167	37.15
Information and Transportation	16.772	10.05	18.035	13.73	7.989	3.51
Finance and Business	17.322	8.82	21.599	9.51	7.805	7.60
Public services	19.369	19.42	21.509	25.86	7.054	7.99
Service Industry	9.257	31.11	11.621	24.03	6.945	43.69
Total	13.748	100	17.256	100	7.509	100

Wages given in yuan, in constant prices.

Table 5: Number of observations by age group.

Age groups	Full sample	Urban sample	Migrants sample
16-34 years old	4131(44.65%)	1805 (30.48%)	2326 (69.85%)
35-60 years old	5120 (55.35%)	4116 (69.52%)	1004 (30.15%)
Total	9251	5921	3330

Table 6: Returns to schooling: Mincerian wage equation.

Variables	**Full sample**	**Urban sample**	**Migrants sample**
Years of schooling	0.052***	0.056***	0.031***
	(0.002)	(0.003)	(0.003)
Migrant dummy	-0.222***		
	(0.017)		
Young (age<35 years old)	0.090***	0.056	0.132***
	(0.023)	(0.034)	(0.030)
male	0.159***	0.176***	0.132***
	(0.012)	(0.016)	(0.015)
Married	0.056***	0.058**	-0.011
	(0.018)	(0.025)	(0.021)
Minority	0.101*	0.042	0.102*
	(0.053)	(0.077)	(0.061)
age	0.026***	0.021**	0.056***
	(0.005)	(0.010)	(0.006)
Age square	-0.000***	-0.000**	-0.001***
	(0.000)	(0.000)	(0.000)
Tenure of current job	0.031***	0.026***	0.033***
	(0.002)	(0.003)	(0.004)
Tenure square	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)
State enterprises	0.004	-0.030	0.013
	(0.014)	(0.019)	(0.021)
Agriculture, forestry and animal husbandry	0.357***	0.378***	-0.041
	(0.080)	(0.088)	(0.289)
Manufacture, production and construction	0.070***	0.106***	0.054***
	(0.016)	(0.023)	(0.019)
Information Transmission &Transportation	0.143***	0.185***	0.042
	(0.022)	(0.027)	(0.040)
Finance and Business	0.168***	0.275***	-0.005
	(0.022)	(0.029)	(0.029)
Public	0.188***	0.257***	-0.039
	(0.018)	(0.024)	(0.029)
Firm size 1 (1 to 5 employees)	-0.179***	-0.162***	-0.164***
	(0.025)	(0.039)	(0.028)
Firm size 2 (6 to 20 employees)	-0.114***	-0.148***	-0.068***
	(0.017)	(0.023)	(0.022)
Firm size 3 (21 to 99 employees)	-0.009	-0.036**	0.009
	(0.014)	(0.018)	(0.018)
Permanent	0.252***	0.425***	0.066***
	(0.020)	(0.032)	(0.024)
Long term	0.126***	0.249***	0.116***
	(0.017)	(0.027)	(0.019)
Short term	0.011	-0.041	0.067***
	(0.025)	(0.043)	(0.025)
Henan	-0.601***	-0.777***	-0.349***
	(0.022)	(0.030)	(0.032)
Anhui	-0.570***	-0.762***	-0.341***
	(0.022)	(0.030)	(0.030)
Chongqing	-0.497***	-0.634***	-0.384***
	(0.024)	(0.033)	(0.030)
Shanghai	-0.043**	-0.156***	-0.030
	(0.022)	(0.030)	(0.030)
Jiangsu	-0.277***	-0.451***	-0.102***
	(0.021)	(0.030)	(0.025)
Zhejiang	-0.147***	-0.252***	-0.089***
	(0.021)	(0.030)	(0.024)
Hubei	-0.432***	-0.536***	-0.351***
	(0.023)	(0.032)	(0.029)
Sichuan	-0.409***	-0.593***	-0.185***
	(0.022)	(0.029)	(0.030)
Constant	0.976***	1.080***	0.439***
	(0.123)	(0.229)	(0.127)
Observations	9251	5921	3330
R2	0.464	0.403	0.317

Note: 1. Base groups include Service sector industry; firm size of more than 100 employees and.in Guangdong province.

Table 7: Returns to schooling: young and schooling interactions.

Variables	Full sample	Urban sample	Migrants sample
Years of schooling	0.056***	0.060***	0.023***
	(0.002)	(0.003)	(0.004)
Migrant dummy	-0.229***		
	(0.017)		
Young (age<35 years old)	0.215***	0.237***	-0.006
	(0.050)	(0.086)	(0.059)
Young * Years of schooling	-0.010***	-0.013**	0.015***
	(0.004)	(0.006)	(0.005)
Observations	9251	5921	3330
R2	0.465	0.403	0.319

Table 8: Returns to required education, over-education and under-education.

Variables	Full sample	Urban sample	Migrant sample
Years of required education	0.105***	0.151***	0.028*
	(0.004)	(0.007)	(0.016)
Years of over-education	0.040***	0.031***	0.040***
	(0.003)	(0.004)	(0.005)
Years of under-education	-0.029***	-0.042***	-0.020***
	(0.003)	(0.005)	(0.004)
Migrant dummy	-0.248***		
	(0.017)		
Young (age<35 years old)	0.103***	0.073**	0.138***
	(0.023)	(0.034)	(0.031)
male	0.153***	0.185***	0.133***
	(0.012)	(0.016)	(0.016)
Married	0.043**	0.038	-0.011
	(0.018)	(0.025)	(0.022)
Minority	0.107**	0.034	0.108*
	(0.053)	(0.076)	(0.061)
age	0.028***	0.024**	0.054***
	(0.005)	(0.010)	(0.006)
Age square	-0.000***	-0.000***	-0.001***
	(0.0001)	(0.000)	(0.000)
Tenure of current job	0.031***	0.026***	0.034***
	(0.002)	(0.003)	(0.004)
Tenure square	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)
State enterprises	-0.000	-0.040**	0.012
	(0.014)	(0.018)	(0.021)
Agriculture, forestry and animal husbandry	0.312***	0.352***	-0.083
	(0.080)	(0.087)	(0.291)
Manufacture, production and construction	0.067***	0.092***	0.044**
	(0.016)	(0.023)	(0.019)
Information Transmission and Transportation	0.136***	0.170***	0.031
	(0.022)	(0.026)	(0.040)
Finance and Business	0.131***	0.258***	-0.012
	(0.022)	(0.029)	(0.030)
Public	0.136***	0.192***	-0.044
	(0.019)	(0.024)	(0.029)
Firm size 1 (1 to 5 employees)	-0.175***	-0.156***	-0.160***
	(0.025)	(0.039)	(0.028)
Firm size 2 (6 to 20 employees)	-0.115***	-0.155***	-0.066***
	(0.017)	(0.023)	(0.022)
Firm size 3 (21 to 99 employees)	-0.016	-0.050***	0.011
	(0.014)	(0.018)	(0.019)
Permanent	0.252***	0.416***	0.068***
	(0.020)	(0.032)	(0.024)
Long term	0.130***	0.241***	0.126***
	(0.017)	(0.027)	(0.019)
Short term	0.017	-0.035	0.073***
	(0.025)	(0.043)	(0.025)
Henan	-0.588***	-0.752***	-0.360***
	(0.023)	(0.030)	(0.032)
Anhui	-0.557***	-0.749***	-0.352***
	(0.022)	(0.030)	(0.030)
Chongqing	-0.472***	-0.590***	-0.375***
	(0.024)	(0.033)	(0.030)
Shanghai	-0.017	-0.141***	-0.040
	(0.022)	(0.030)	(0.030)
Jiangsu	-0.260***	-0.449***	-0.104***
	(0.021)	(0.030)	(0.025)
Zhejiang	-0.152***	-0.265***	-0.099***
	(0.021)	(0.030)	(0.024)
Hubei	-0.415***	-0.532***	-0.345***
	(0.023)	(0.032)	(0.030)
Sichuan	-0.388***	-0.591***	-0.178***
	(0.022)	(0.029)	(0.030)
Constant	0.400***	-0.039	0.495***
	(0.130)	(0.239)	(0.194)
Observations	9251	5921	3330
R2	0.467	0.417	0.310

Table 9: Returns to required, over-education and under-education: young interactions.

Variables	Full sample	Urban sample	Migrant sample
Years of required education	0.120***	0.159***	-0.019
	(0.005)	(0.008)	(0.027)
Years of over-education	0.040***	0.034***	0.060***
	(0.005)	(0.006)	(0.014)
Years of under-education	-0.029***	-0.045***	-0.012**
	(0.004)	(0.005)	(0.005)
Migrant dummy	-0.259***		
	(0.017)		
Young (age<35 years old)	0.571***	0.435**	-0.482
	(0.098)	(0.180)	(0.296)
Young* years required education	-0.040***	-0.029**	0.069**
	(0.008)	(0.014)	(0.031)
Young* years over-education	-0.001	-0.007	-0.024
	(0.006)	(0.008)	(0.015)
Young* years under-education	0.001	0.049**	-0.025***
	(0.008)	(0.020)	(0.009)
Observations	9251	5921	3330
R2	0.468	0.418	0.313