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Parental Migration and Young Migrants' Wages in Urban China: An Exploratory Analysis

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Abstract

Since the initiation of the economic reforms in 1978, generations of Chinese migrants have moved from the countryside to cities to seek job opportunities. As a result of financial constraints and institutional obstacles, many migrants leave their children at the place of origin, taken care of by partners, grandparents and other caregivers. Whilst previous studies primarily focus on the impacts of parental migration on children's education and health, very few studies have examined its longer-term impacts on labour market income when children reach adulthood. Yet parental migration is likely to influence children's human capital accumulation and skill development. Drawing on data from the 2011 Chinese Migrant Dynamics Monitoring Survey, this paper fills in the gap by exploring the relationship between different types of parental migration and children's wages when children grew up and migrated to work in cities. Structural models are employed to estimate both education and wage equations simultaneously to capture the direct effect of parental migration on wages, together with the mediating effect of education. The results show significantly negative relationships between parental migration and young migrants' educational attainment and wages. Those who experienced the out-migration of both parents are most disadvantaged in the urban labour market. The study is important for policies aimed at improving migrants' life prospects and enhancing social mobility and equality.

Keywords: Rural-to-urban migration; China; parental migration; labour market; left-behind children

1. Introduction

China has experienced the largest rural-to-urban migration wave in human history since the initiation of the economic reforms in 1978. According to China's National Bureau of Statistics, there were about 250 million rural migrants in 2011 (NBS, 2012). However, only 21% migrated with their entire family (Lei et al., 2017). Many migrants leave their children at the place of origin due to financial constraints and institutional obstacles resulting from the household registration (hukou) system. According to the system, migrants cannot get local hukou status automatically after they migrate, and are therefore excluded from many benefits and services at destination, including subsidised housing, minimum living allowance and unemployment insurance. In addition, they cannot send their children to local state schools in many cities, unless they pay placement fees and/or provide all required documents such as proofs of tax payment and stable housing. Even if they provide these documents, their children are not allowed to go to local high schools which are beyond nine years' compulsory education (Chen et al., 2013). As a result, many migrants adopt a split-family strategy by leaving their children in the care of partners, grandparents and other relatives in the countryside (Fan, 2008).The Fifth Population Census shows that there were 19.81 million rural children aged 17 or below who were left-behind by one or both parents in 2000 (Duan and Zhou, 2005). According to the Sixth Population Census, the number increased dramatically to about 62 million in 2010, accounting for 38 per cent of the

children in the countryside and 22 per cent of the children nationwide (Duan et al., 2013; All-China Women's Federation 2014). China is reported to have the largest number of left-behind children among developing countries (Lei et al., 2017).

Existing studies have focused on the impacts of parental migration on children's education and health (e.g. Antman, 2012; Zhao et al., 2014). There is a dearth of research on the longer-term impact of parental migration on children's labour market outcomes when they reach adulthood and migrate to work in cities. It is important to study labour market outcome because it is an important indicator of social mobility. An investigation of the relationship between parental migration and children's wages can enhance our understanding of the consequences of labour migration on left-behind children and social mobility over migrant generations. Such knowledge is conducive to policies aimed at improving migrants' life prospects and social equality. Western literature on inter-generational mobility focuses on the impact of family disruption, in particular, the divorce or separation of a partner, on children's labour market outcomes, through the mechanisms of reduced household income and parental engagement. However, family separation as a result of migration in China differs from the single parenthood in the Western context in that migrant parents sent back remittance which increases household income. Parental migration may influence children's human capital accumulation and skill development both positively through increased investment and negatively by reduced parental care. This will affect their labour market outcomes.

This paper aims to fill in the above gap by examining the relationship between parental migration and children's labour market outcomes after children migrated to work in cities. Specifically, we compare the wages of young rural migrants who were left behind because of parental migration during their childhood with migrants who grew up with at-home parents. Young rural migrants are defined as those who were born after 1980 and brought up in the place of origin before they migrate to work in cities, consistent with the definition of 'new-generation migrants'. They 'grew up already knowing and seeing migrant work as an established way of life' (Fan and Chen, 2014, p. 19), and followed the footsteps of their parents or other migrants to move to cities immediately or shortly after full-time schooling. They are now the major migrant labour force in urban China. Migrant parents are defined as those who had been away from their children at the place of origin for at least one year[1] when children grew up.

Parental migration may influence children's cognitive and non-cognitive development, including education, health, soft skills such as communication, attitudes, aspirations and behaviour. Since educational attainment is one of the indicators of human capital crucial for labour market outcomes, it acts as an important mediator between the relationship between parental migration and wages. Using structural models, we investigate the direct association between parental migration and labour market income, as well as the indirect one, i.e. parental migration influencing children's

[1] Some studies define migrant parents as those who had been away from their hukou origin for over 6 months; and left-behind children as those who were left in the hukou origin by their migrant parents for over 6 months (Duan and Zhou, 2005). However, our data can only identify those parents who had been away for over a year.

education which further affects income. Four types of parental migration are distinguished, i.e. both parents being at hometown, maternal migration only, paternal migration only, and the out-migration of both parents, to see whether heterogeneities exist among these groups.

Our data come from the 2011 Chinese Migrant Dynamics Monitoring Survey which records information on young migrants and their parental migration. It is cross-sectional in nature. Ideally we need longitudinal data which follow individuals over their childhood and adulthood, to examine the impact of family structure on labour market outcomes. However, such data do not exist in China[2]. Based on existing cross-sectional data, we aim to provide an exploratory analysis of the association, rather than the causation, between parental migration and labour market income, and to provide potential explanations for the association. Despite the data limitation, the importance and originality of the topic deserves a first exploration, which is conducive to suggesting directions for future research and data collection.

The rest of the paper is organised as follows. Section 2 reviews previous studies on family disruption and children's economic wellbeing. Studies on the impact of parental migration on children's development in the Chinese context are also reviewed to provide context. Section 3 introduces the research design including survey data and

[2] Efforts have been made to collect longitudinal data following residents (e.g. China Family Panel Studies CFPS) or migrants in particular (e.g. the Longitudinal Survey on Rural Urban Migration in China RUMiC). However, these surveys have only started in recent years, and have not followed children to their adulthood.

methods. This is followed by the discussions of empirical results in Section 4. Section 5 concludes with main findings, limitations and directions for future research.

2. Literature review

Family disruption and children's economic wellbeing

Family is the most important institution influencing children's development, including their physical and mental health, intellectual and social abilities. Family disruption is likely to influence children's labour market outcomes when they reach adulthood. First, family disruption influences household income. According to the household production model (Becker, 1991), a decline in household income is likely to adversely affect investment on children's education, which has a longer-term impact on children's human capital development and productivity. Second, the absence of one or two parents may reduce the care and support provided to children. Parents may spend less time with children, supervising and monitoring their progress and behaviour. According to the social control theory (Thornton, 1991), supervision and monitoring of children's development is crucial for children to avoid behaviour problems which might influence job performance in their adulthood. Grandparents or custodial parents are likely to exert less authority or control on children than their biological parents. Third, family disruption may bring emotional stress to children, as a result of both the

disruption itself and/or lack of parental care afterwards. Such emotional stress may influence children's skill development.

Empirical studies have been conducted in the Western context to examine the impacts of family disruption on children's economic wellbeing, using both cross-sectional and longitudinal data. Most studies find that children living with a single parent are more disadvantaged than those with married biological parents, in terms of educational attainment and labour market performance. However, it is inconclusive whether such a relationship is causal or not, because of the endogenous nature of family structure and omitted variables. For example, Murray and Sandqvist (1990) reported negative relationship between living with a single mother at age 13 and educational attainment at age 21 in Sweden. Using the 1984 birth cohort in Manitoba et al. (2009) find that children who experienced changes in family structure are more likely to drop out from high schools, compared with those living in stable two-parent families. Song, Benin and Glick (2012) also find negative association between family disruption and high-school completion rate. However, once they control for economic resources before family disruption, such difference is significantly reduced. Using the 1991-1995 waves of the British Household Panel Survey, Ermisch and Francesconi (2001) find that people living with a single parent not only receive a lower level of educational attainment, but are more likely to experience economic inactivity, early child bearing, distress and smoking. Fronstin et al. (2001) agree that family disruption leads to a lower level of educational attainment for both males and females, based on data from the

British National Child Development Survey. They also reported that family disruption is associated with decreased employment rate for males and lower wages for females at age 33, even after they control for pre-disruption family circumstances. Bjorkland et al. (2007) maintains that children who were brought up in non-intact families are more likely to obtain lower levels of education and earnings, using the 1979 cohort of the National Longitudinal Survey of Youth and the Panel Study of Income Dynamics in the US. However, they find these negative impacts become insignificant when within-family variation is removed.

Parental migration results in a distinct form of family separation, which differs from family disruption as a result of divorce or separation of a partner in the Western context in that migrants' remittance may lead to a significant increase of family income. This echoes with the new economic theory of labour migration which indicates that migration is a household strategy to diversify risks by sending some family members to work elsewhere and remit money back (Stark and Bloom, 1985). Studies on international migration have shown that remittances from abroad relax household budget constraints in developing countries, which enables migrant families to invest on children's education and health and to decrease child labour (Antman, 2012; Kandel & Kao, 2001). For example, Edwards and Ureta (2003) reported that remittance from international migration has a significantly greater role in improving left-behind children's education than local household income in El Salvador. Yang (2008) finds that the Asian financial crisis in 1997 resulted in an increase of remittances sent by

international migrants due to the devaluation of the Philippine currency. This effectively enhanced the schooling rate of left-behind children in Philippine. Antman (2012) distinguishes between domestic and Mexico-US international migrations, and find that fathers' migration to the United States has a significantly positive effect on daughters' education in Mexico, whilst fathers' domestic migration does not. Acosta (2011) reported that remittance is particularly useful in improving girls' schooling in El Salvador. This can be explained by an increase in women's bargaining power in the household when men migrate, which significantly enhances resource input for girls (Antman, 2011).

In the meantime some negative consequences of parental international migration are reported. For instance, Kandel & Kao (2001) acknowledges the positive income effects of Mexico-US international migration on left-behind children's academic performance. But parental migration decreases children's aspiration to obtain higher educational levels (such as university) because children have more exposure to migration to the US as an alternative route of social mobility, and their education in Mexico might not be valued in the US labour market. Lahaie et al (2009) show that parental international migration has detrimental effects on left-behind children's academic, behavioural and mental health issues in Mexico. Cortes (2015) compares the impacts of paternal and maternal migration on children's outcomes, and finds that maternal migration has more detrimental impacts than paternal migration.

Parental migration and the impact on children's development in China

Similar to international migration, many Chinese migrant parents who moved to cities tend to send back remittance which reduces the economic vulnerability of the household in the countryside. Traditionally individuals rely on family members for care and support in rural areas because access to social benefits is limited. Remittance is beneficial to children's development, as more resources are available to invest on schooling, food and nutrition. It is reported that left-behind children are more likely to live in better housing conditions and to have access to mobile phones than others (Shen et al., 2015). However, the absence of one or both parents reduces the levels of parental care, supervision and support. Living apart, migrant parents may not be able to supervise their children's homework adequately, or communicate with teachers directly and frequently. Left-behind children may have more responsibilities for house chore and less time on school-related activities (Chang et al., 2010). Moreover, absence of parents may have adverse impacts on children's psychological development (Zhao and Yu, 2016). Finally, left-behind children may face more competing alternatives to schooling; with information about jobs in cities, they may drop out from schools earlier and follow the footsteps of their parents to work elsewhere (Bredl, 2011).

A large number of studies have discussed both the positive and negative impacts of parental migration on children's education in China. Some studies report insignificant effects, because remittance enhances family resources which cancel off the negative impact of parental absence. For example, Wen et al (2015) collected data from

864 rural young people between 10 and 17 years old in Guangxi Province in 2010, and find that parental migration does not affect children's Chinese and maths test scores. However, other studies find significantly negative impacts. Using a survey of 7648 students in primary schools in rural areas of Ningxia and Qinghai in Northwest China, Zhao et al. (2014) reported that parental migration leads to a reduction of a child's math score rank by 15.6%; in particular, a reduction of 8.37% due to paternal migration and 23.3% because of maternal migration. Zhang et al (2014) reported that the absence of both parents significantly reduces left-behind children's cognitive development, a decrease of 5.4 percentile points for maths and 5.1 percentile points for Chinese, but the effects are much smaller for those children being left-behind by one parent. Wang and Mesman (2015) reviews eight papers and find seven of them show that left-behind children have poorer performance on standardised tests at schools when compared with non-left-behind children.

Studies have also examined the impacts of parent migration on left-behind children's health. Some find a negative relationship, as left-behind children are more likely to develop higher levels of stress, loneliness, and lower levels of self-esteem, as a result of separation from parents and reduced parent-child interaction (e.g. Wu et al., 2015). Zhao and Yu (2016) conduct a meta-analysis of parental migration and mental health, based on 32 studies. They conclude that the left-behind experience is detrimental to mental health of children, especially to girls, children in primary schools and self-guardian children. However, using the cross-sectional survey data of 2283 rural children

aged 10-18 years from Hebei Province in 2012, Shen et al. (2015) find insignificant relationship between parental migration and depression/anxiety. The authors explain that most left-behind children in the survey lived with their mothers and other family members who provided psychological support. This is confirmed by Ren and Treiman (2016) which show no difference in emotional wellbeing between left-behind children and those living with both parents, using data from the China Family Panel Studies.

In summary, there are both positive impacts of parental migration on left-behind children due to remittance and negative ones resulting from family separation and reduced parental care. The way how the positive and negative impacts balance out depend on specific circumstances, including family split arrangement, contact with children and the rural community. Previous studies focus on the impacts of parental migration on children's education and health. Yet, very few studies have examined the longer-term influence on labour market outcomes when children reach adulthood. This paper will use the following research design to fill in the gap.

3. Analytical framework, data and methods

According to Becker's human capital theory, investment on human capital increases individuals' productivity which in turn brings high labour market income (Becker, 1993). Human capital is defined as 'productive wealth embodied in labor, skills and knowledge and it refers to any stock of knowledge or the innate/acquired characteristics a person has that contributes to his or her economic productivity' (Tan, 2014, p. 412).

Education is an important indicator of human capital crucial in determining wages. Previous studies have shown that parental migration influences children's educational attainment because of remittance and reduced parental care (e.g. Zhao et al., 2014). In the meantime, parental migration may influence children's cognitive and non-cognitive abilities, behaviour and social skills such as communication, which are also important in influencing labour market outcomes. Thus, both direct and indirect impacts of parental migration on young migrants' labour market income may exist. Education acts as a mediator in the relationship between parental migration and labour market income.

Besides education, the wage structure in China is influenced by individuals' gender, work experience, job-related characteristics such as occupation, industry, company ownership, and geographical location, as shown in previous studies on both migrants and local residents (Knight and Song, 2005; Liu et al., 2017). There might be debates regarding whether parental migration may influence children's job-related factors such as occupation and industry. However, there is no particular theory or robust evidence from previous studies in China supporting this hypothesis. Therefore, we focus on the direct and indirect relationship between parental migration and children's income through the mechanism of educational attainment, and assume that children with or without migrant parents when they grew up have different labour market incomes after they migrated to work in cities.

Our data come from the new-generation migrant survey of the 2011 Chinese Migrant Dynamics Monitoring Survey (CMDMS) which is organised by China's

National Population and Family Planning Commission (NPFPC). We use this survey because it focuses on new-generation migrants and records information on parental migration and the locations of primary and junior middle schools besides demographic characteristics and labour market outcomes. The survey employed a three-stage probability proportional to size (PPS) sampling method to provide a nationally representative sample of young migrants. Twenty cities in 12 provinces[3] were selected purposively at the first stage, representing popular migration destinations at different administrative levels in different parts of the country. In each city, communities were randomly selected. At the final stage, migrants were recruited randomly in each community to fill in questionnaires. Altogether there are 9989 respondents who were born after 1980 and had valid labour market information. Among them, 1901 respondents hold urban hukou status and are thus removed from the study; 230 respondents who went to either primary or junior middle schools in non-hukou areas are also excluded. The survey does not record the exact time when parents migrated, but records their total years of being away from home by 2011. In order to ensure that parents migrated before their children migrated, we further remove the samples where parents' migration duration is shorter than their children's. The final sample size is 6580 after dropping missing values for key variables.

[3] Cities in North China include Beijing, Tianjin, Shenyang, Dalian, Taiyuan, Zhengzhou, Xi'an and Xieyang. Those in the East are Shanghai, Hangzhou, Ningbo and Wenzhou. Those in the middle include Wuhan, Shiyan and Xiangyang. Those in the South and Southwest are Guanzhou, Shenzhen, Dongguan, Chengdu and Chongqing.

Structural models are employed to take into account both direct and indirect effects of parental migration. The model enables us to unravel the route through which parental migration might affect labour market income, in particular, the mediating effects of education. Specifically, we estimate two models, education and income, simultaneously in a structural framework, while making their error terms correlated with each other. As years of education and income are numerical variables, linear regression models specified below are employed:

$$Edu_i = a_0 + a_1 x_{1i}^{'} + a_2 x_{2i}^{'} + u_i \qquad (1)$$

$$LnIncome_i = b_0 + b_1 Edu_i + b_2 x_{1i}^{'} + b_3 x_{3i}^{'} + \varepsilon_i \qquad (2)$$

$$u_i \sim N(0, \sigma_u^2), \varepsilon_i \sim N(0, \sigma_e^2)$$

The subscript i denotes an individual. x_1 is a vector of explanatory variables which influence both education and income, such as parental migration and gender. a_1 is the corresponding coefficients to estimate. Both the binary variable of 'either parent being away' and four different categories of parental migration are used in separate models. x_2 represents a vector of variables which influence education but not income, such as household circumstances at the place of origin where respondents had primary and/or secondary schools. The 2011 CMDMS survey provides information on the locations of primary and junior middle schools, location of original housing, and farmland allocated to the household. As shown in previous studies (Li, 2016), schools located in towns and cities have better facilities and staff resources than those in

villages, reflecting the huge rural-urban divide in terms of educational resources and school quality. It is assumed that such differences may influence individuals' educational attainment. Similarly, location of original housing in a town or a village reflects the public services and resources the household had access to. Farmland allocated to a household may be related to the workload of family members, which might distract children from schooling activities. These variables about the place of origin are tested to be directly associated with educational attainment, but not wages after respondents moved to work in cities, thus fulfilling the exclusion restriction requirement. Finally, provincial dummies of places of origin are added into the education model, accounting for the geographic differences in economic development levels and educational resources. a_2 is the corresponding coefficients to estimate.

For the income model, we use the conventional Mincerian earnings equation which has been used effectively for wage analysis in China (Mincer 1974; Knight and Song, 2005). The dependent variable is logarithmic hourly wages, calculated as monthly wages divided by the number of hours worked per month. Besides education and x_1, work experience, work experience squared, marital status, job-related characteristics such as occupation, industry and company ownership, are included in the model, following previous studies (e.g. Knight and Song, 2005). In addition, dummies of destination cities are added to capture the heterogeneities in different geographical contexts.

It is noted that parental migration may be endogenous, because migration decision-making of parents may not be random, contingent on family circumstances which might influence children's economic wellbeing. This is a common methodological challenge when examining the impact of family disruption on children's development. It would be useful to control for family circumstances before parents migrated. The 2011 survey only provides limited information on family migration history. In particular, no information on the exact timing of parental migration and pre-migration household conditions is recorded. An alternative to reduce endogeneity bias is to use instrumental variables. However, there are four different categories of parental out-migration, which makes it extremely difficult to find suitable instrumental variables to enable identification in this study. Therefore, some of our findings may be subject to alternative explanations related to the selection problem which we could not exclude. By focusing on the association between parental migration and labour market income using structural models, our purpose is to compare the incomes of young migrants with and without migrant parents when they grew up, and to discuss the likely mechanisms, including the direct effect and the mediating effect through education.

4. Empirical findings

Descriptive information

Table 1 displays the descriptive statistics of the variables used in the study. Among the 6580 respondents, 23.95% had experiences of either mother or father

working away from their places of origin when they grew up. In particular, 16.38% of the respondents experienced the out-migration of both parents; 6.84% had lone migrant fathers and 0.73% had lone migrant mothers. One explanation for the low percentage of lone migrant mothers is that females usually migrate with their partners after marriage (Fan, 2008). The respondents' average years of education are 10.37, consistent with existing literature which states that new-generation migrants' years of education vary between 8.9 and 10.9 years (Chen and Fan, 2014). The majority of the respondents had their original housing in villages. About 93.94% went to primary schools in the countryside, with very few educated in schools located in county towns of hukou registration. A larger proportion (32.43%) went to junior middle schools located in county towns, because no such schools exist in small villages and residents have to go to the nearest towns for secondary schools.

Work experience is calculated as years since the first non-agricultural work after migration. This is justified as most new-generation migrants moved to work in cities immediately or shortly after they completed full-time education at hometown (Chen and Fan, 2014). According to our data, over 96% of the respondents secured a job after their first migration. For those who continued to study after migration, work experience is calculated using the formula (age – years of education – 6), according to previous studies (Knight and Song, 2005). Regarding occupation, 39.22% of the respondents worked as sales personnel, and 37.96% acted as production workers. Those in managerial or professional positions only account for 17.45%. This corresponds to

previous studies which demonstrate that migrants are concentrated in low-skilled jobs, mainly in the manufacturing and service sectors (Chen, 2011). About 46.55% of the respondents worked in private companies and 24.64% were self-employed, such as street vendors and service providers including shoe repairers and housing decorators. Only 10.11% were employed in publicly-owned companies, as many jobs in those companies require local hukou status (Chen, 2011).

(Table 1 about here)

Table 2 presents the cross-tabulation of education and wages for young migrants with different types of parental migration. It shows that respondents with neither parent out have the highest average years of education. Those with maternal migration only have the lowest educational level. Similar patterns exist for hourly wages. Results of the two-sample T-tests[4] and ANOVA[5] show that significant differences exist regarding educational attainment and wages among these groups. In the next section we examine the association between parental migration and wages while controlling for demographic, work experience and job-related factors.

(Table 2 about here)

Empirical analysis of parental migration and income

[4] The results of t-test for the two groups with and without migrant parent(s) are as follows. Regarding education, t=3.7193 with p-value=0.0002; regarding wages, t=3.4933 with p-value =0.0005. These results show significant differences between the two groups in terms of education and wages.

[5] The results of ANOVA tests for the four groups with different types of parental migration are as follows. Regarding education, F=4.32 with p-value=0.0047; regarding income, F=10.57 with p-value=0.0000. These results show significant differences among these groups.

We start from the OLS regression models, with log wage as the dependent variable and education as an exogenous variable (Table 3). Parental migration is represented as a dichotomous variable in Model 1 and four categories in Model 2. The results show that parental migration has significantly negative impacts on young migrants' wages. This may be attributed to the negative consequences of parental migration on children's development, such as health and the development of cognitive and non-cognitive skills, demonstrated by previous studies (Zhao et al., 2014; Wang and Mesman, 2015). Most of the other variables in Model 1 have the expected impacts on wages. For example, years of education are significantly and positively related with wages; work experience has significant non-linear effects, i.e. wages increase with work experience, but at a decreasing rate. Female migrants receive lower wages compared with males, all else being equal. Being married is significantly positively associated with wages. Compared with managerial or professional positions, sales personnel are paid less; production and service workers receive even lower wages. Those employed in the service and construction sectors have higher wages than workers in manufacturing factories, holding everything else constant. Compared with private companies, staff in publicly-owned and foreign companies enjoy a wage premium, while the self-employed are lowest paid, ceteris paribus. Self-employed migrants are usually casual workers in the informal economy least regulated by the government. When we distinguish between four different types of parental migration in Model 2, it is clear that the migration of

both parents is significantly negatively associated with wages. The coefficients for paternal and maternal migration only are negative but insignificant.

(Table 3 about here)

Since educational attainment, a crucial wage determinant, is likely to be influenced by parental migration, both direct and indirect effects of parental migration on wages may exist. In Model 3 and 4, education and income are estimated simultaneously in structural models, with dichotomous and different categorical variables of parental migration, respectively. Model 3 shows that parents' out-migration is significantly negatively associated with years of education. Although migration remittance may increase investment to children, lack of sufficient parental care, supervision and support may have detrimental impacts, leading to net negative correlation between parental migration and educational attainment. The result corresponds to previous studies demonstrating adverse impacts of parental migration on children's education (Zhao et al., 2014). Most variables in the education model are as expected. For example, attending junior middle schools in urban areas significantly improves educational attainment, while attending primary schools in cities does not make a difference. It suggests that school quality at secondary level is crucial for individuals' educational attainment. Those residing in towns or cities benefit from better public services and resources than rural residents. Farmland between three and seven mu are negatively associated with educational attainment. Housework or agricultural work is likely to distract children from school activities. In terms of wages, parental

migration exerts a direct negative effect. Absence of parents may affect children's development of social skills and behaviour, besides educational attainment. These skills may also influence wages. Compared with the OLS results, education exhibits a larger impact on wages. With the increase of one year's schooling, an individual receives a wage increase of 7.14%[6] rather than 4.63% in the OLS model (Model 1). Other variables have shown similar patterns to the OLS results. An interesting finding concerns the gender effects; all else being equal, females obtain higher levels of educational attainment compared with males; however, their wages are significantly lower than males after controlling for all other variables. Such a gender effect in the labour market has been supported by previous studies (e.g. Knight and Song, 2005).

When different types of parental migration are added in Model 4, it shows that the out-migration of both parents is significantly negatively associated with educational attainment. Compared with those with non-migrant parents, those with lone migrant fathers receive fewer years of education. The impact of lone migrant mothers is also negative, but statistically insignificant. For the wage equation, the respondents with both migrant parents suffer from a wage loss, compared with those with non-migrant parents. The impacts of maternal or paternal migration only are insignificant.

Model 4 shows that parental migration exerts both direct effects on wages and indirect effects through educational attainment. Such direct and indirect effects are calculated in Table 4. The results confirm its negative impacts on wages. The out-

[6] This is calculated as (exp(0.0690)-1).

migration of both parents has the largest negative effects, possibly because the absence of both parents significantly reduces the level of care, support and supervision to children, and thus adversely influences educational attainment and the development of social skills. Females are associated with higher educational attainment compared with males. However, female migrants receive significantly lower wages than males. The total effects of being female on wages are significantly negative.

(Table 4 about here)

As significant gender effects are observed in Table 3, we estimate the structural models for females and males separately in Table 5. For females, parental migration does not have significant impacts on educational attainment. Compared with those with non-migrant parents, the out-migration of both parents exerts negative impacts on wages. Hence, parental migration only has direct negative impacts on females' wages. For males, the out-migration of both parents negatively influences their educational attainment as well as wages. Moreover, both paternal migrations only and maternal migrations only have significantly negative associations with education. It suggests that parental migration has a more detrimental effect on educational attainment for males than for females. One explanation is that boys may benefit more from parental supervision and monitoring than girls in terms of school activities and homework. If parents are absent, boys may experience weak social control and are more likely to develop behaviour problems than girls, such as drinking, fighting or smoking. This will influence their educational attainment adversely. Moreover, as males' wages are higher

than females', young men may face more competitive alternatives to schooling, and are more likely to drop out of schools and work elsewhere, with their parents' absence.

Table 5 also shows that the wage return to education is lower for females than for males. For one year's increase in education, a female respondent receives a wage increase of 6.33%, while the corresponding increase for a male respondent is 8.82%. In addition, significant gender differences exist in the effects of farmland allocation and marriage. Farmland allocation significantly negatively influences educational attainment for girls only. It suggests that girls are more likely to be influenced by housework than boys in the countryside. The wage premium of marriage is only significant for males. This is probably because females are more involved in domestic work than males after marriage.

(Table 5 about here)

5. Conclusion

Millions of children have been left behind in China's countryside by one or both parents who migrated to work in cities. Previous studies have primarily focused on the impacts of parental migration on children's education and health. This study extends the literature by examining the relationship between parental migration and children's labour market income when they reach adulthood. Drawing on data on young migrants in the 2011 Chinese Migrant Dynamics Monitoring Survey, we employ structural

models of education and income, and estimate the direct and indirect effects on wages of four different types of parental migration, i.e. both parents being at hometown; paternal migration only; maternal migration only; and the out-migration of both parents. We find parental migration is not only associated with children's educational attainment which influences labour market income, but has a direct effect on children's income after they reach adulthood. Compared with respondents with at-home parents, those with lone migrant fathers obtain fewer years of education; those with two migrant parents are significantly worse off in terms of both years of education and wages. The total effects of parental migration on wages are shown to be negative, especially when both parents moved to work in cities. This may be explained by reduced parental care, supervision and support to their children. Despite the potential positive impacts of remittance, they fail to compensate for the detrimental influences of parents' absence. Parents are responsible for discipline and supervision of their children's development. Guardians may not provide the same levels of authority, supervision and care to children as their biological parents. Significant gender effects also exist. Parental migration exerts negative indirect effects on wages through its impact on educational attainment for males only. It suggests that discipline, supervision and monitoring from parents are more important for boys than for girls to enhance their commitment to schooling and to improve educational attainment.

Migration has resulted in significant changes to the traditional family support structure in the countryside. Parental migration is negatively associated with educational

attainment and labour market outcomes, especially for those with both migrant parents. Policy initiatives are needed to support left-behind children, and to help them develop skills within and beyond school curriculums. Certain skills such as communication and team-work might become more and more important to jobs in cities, with the development of the service sector and the upgrading of the Chinese economic structure. It is therefore important to ensure that left-behind children get access to training and support in this regard. Moreover, policies should facilitate closer supervision of children in migrant families. They should also pay attention to the system of social insurance in the countryside. In particular, rural communities can be provided with more resources to support left-behind children. An alternative is for policies to facilitate family migration, most importantly, removing the barriers to the schooling of migrant children in cities so that they are entitled to the same level of education as their urban counterparts.

This exploratory study has limitations. First, it is based on a cross-sectional survey on young migrants with limited information on family circumstances in the place of origin and history of parents' migration. Therefore, we are unable to control for parents' educational attainment, time being away when children grew up, and children' age when parents migrated. These factors might influence children's economic wellbeing. Second, we cannot entirely rule out the possibilities of endogeneity for different types of parental migration. Therefore, the association found between parental migration and wages cannot be interpreted as causal. It might equally well be explained by some omitted confounding factors that are related to both parents' migration decision

and children's economic wellbeing, e.g. pre-migration household conditions. Third, we compare the wages of young migrants who were left behind by their migrant parents with those migrants who grew up with at-home parents, using survey data from destination cities. Left-behind children who did not migrate to cities are therefore excluded from our analysis. Although migration has become a way of life in the countryside and many young people choose to migrate because of sustained rural-to-urban divide, the findings of the study cannot be extended to all left-behind children. Despite these limitations, we provide an exploratory analysis of the important topic on parental migration and young migrants' labour market income in China, focusing on both the direct effect and the medicating effect through education. We call for future research on this important topic, especially when longitudinal data with detailed information on migration experiences of family members and pre-migration household circumstances are made available. In particular, future studies should take into account the timing of parental migration, duration of separation and reunion, ways and frequency of contact with children, and circumstances of care-providers in the rural community.

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Tables

Table 1 Summary of variables used in the study

Variables	Description	Proportions (%)/ means
Outcome variables		
Education	Years of education	10.37
Hourly wage	Wage per hour in the previous month	10.95
LnWage	Log hourly wage in the previous month	2.27
Independent variables		
If-parent-out	Either parent migrated	23.95
Type of parental migration	Both parents at hometown (base)	76.05
	Only father migrated out	6.84
	Only mother migrated out	0.73
	Both parents migrated out	16.38
Female	Female =1	48.02
Hk_urbanprimary	Primary schools in the county town of hukou registration	6.06
Hk_urbanjunior	Junior middle schools in the county town of hukou registration	32.43
Housinghome	Housing at hometown located in a village (base)	62.64
	Housing at hometown located in a town	3.72
	Housing at hometown located in a city	1.96
	Others	31.67
Land_at_home	No land at hometown (base)	34.26
	0.01-2.99 mu land at hometown	10.27
	3-4.99 mu land at hometown	21.79
	5-6.99 mu land at hometown	16.49
	Over 7 mu land at hometown	17.19
Work experience	Work experience since first migration (years)	3.34
Married	If married = 1	39.45
Occupation	Manager or professional staff (base)	17.45
	Sales personnel	39.22
	Service personnel	2.54
	Production workers	37.96
	Others	2.83
Industry	Manufacturing (base)	41.49
	Construction	4.89
	Service	48.25
	Other	5.36
Company ownership	Privately-owned company (base)	46.55
	Publicly-owned	10.11
	Foreign	17.01
	Self-employed	24.64
	Other	1.70

Table 2 Cross-tabulation of education and wage for different types of parental migration

Variable	Neither Parent Out	Either Parent Out	Father Out Only	Mother out Only	Both Parents Out
Years of education	10.43	10.21	10.23	9.94	10.21
Hourly wage	11.13	10.06	10.18	9.73	10.02
Ln hourly wage	2.29	2.20	2.21	2.21	2.20
N	5004	1576	450	48	1078

Table 3 OLS and structural models of parental migration and wage

Variables	OLS regression		Structure model M3		Structure model M4	
	Wage M1	Wage M2	Education	Wage	Education	Wage
If-parent-out	-0.0508*** (0.0117)		-0.2498*** (0.0643)	-0.0453*** (0.0120)		
Father out only		-0.0244 (0.0194)			-0.2704* (0.1081)	-0.0192 (0.0196)
Mother out only		-0.0326 (0.0567)			-0.5734 (0.3176)	-0.0204 (0.0573)
Both parents out		-0.0631*** (0.0135)			-0.2264** (0.0749)	-0.0579*** (0.0138)
Female	-0.1199*** (0.0100)	-0.1200*** (0.0100)	0.1290* (0.0545)	-0.1240*** (0.0102)	0.1304* (0.0545)	-0.1240*** (0.0102)
Hk_urbanprimary			0.1928 (0.1225)		0.1924 (0.1225)	
Hk_urbanjunior			0.5206*** (0.0614)		0.5203*** (0.0615)	
Housinghome=housing at township			0.6325*** (0.1451)		0.6345*** (0.1452)	
Housinghome=housing at city			1.1573*** (0.1959)		1.1582*** (0.1960)	
Housinghome=others			0.3417*** (0.0615)		0.3422*** (0.0616)	
Land 0.01-2.99 mu			-0.1548 (0.0964)		-0.1536 (0.0965)	
Land 3-4.99 mu			-0.2417** (0.0751)		-0.2408** (0.0752)	
Land 5-6.99 mu			-0.1691* (0.0818)		-0.1693* (0.0819)	
Land 7 and over			-0.1494 (0.0826)		-0.1488 (0.0827)	
Education years	0.0453*** (0.0023)	0.0453*** (0.0023)		0.0690*** (0.0100)		0.0685*** (0.0099)
Work experience	0.0372*** (0.0038)	0.0371*** (0.0038)		0.0369*** (0.0038)		0.0368*** (0.0038)
Work experience squared	-0.1876*** (0.0297)	-0.1867*** (0.0297)		-0.1861*** (0.0296)		-0.1853*** (0.0296)
Married	0.0879*** (0.0112)	0.0877*** (0.0112)		0.0897*** (0.0112)		0.0896*** (0.0112)

Service personnel	-0.2183*** (0.0169)	-0.2190*** (0.0170)		-0.2178*** (0.0169)		-0.2185*** (0.0169)
Sales personnel	-0.0996** (0.0341)	-0.0993** (0.0341)		-0.0999** (0.0340)		-0.0996** (0.0340)
Production workers	-0.1080*** (0.0155)	-0.1085*** (0.0155)		-0.1059*** (0.0155)		-0.1064*** (0.0155)
Other occupation	-0.0897** (0.0325)	-0.0900** (0.0325)		-0.0904** (0.0324)		-0.0907** (0.0324)
Construction sector	0.2169*** (0.0247)	0.2159*** (0.0247)		0.2140*** (0.0247)		0.2131*** (0.0247)
Service sector	0.0905*** (0.0169)	0.0903*** (0.0169)		0.0891*** (0.0169)		0.0890*** (0.0169)
Other industry	0.0898*** (0.0244)	0.0897*** (0.0244)		0.0897*** (0.0243)		0.0896*** (0.0243)
State owned	0.0677*** (0.0171)	0.0675*** (0.0171)		0.0683*** (0.0170)		0.0681*** (0.0170)
Foreign	0.0639*** (0.0159)	0.0638*** (0.0159)		0.0632*** (0.0159)		0.0631*** (0.0159)
Other ownership	0.0737 (0.0385)	0.0738 (0.0385)		0.0750 (0.0383)		0.0750 (0.0383)
Self-employed	-0.1229*** (0.0132)	-0.1230*** (0.0132)		-0.1231*** (0.0132)		-0.1233*** (0.0132)
Constant	1.9579*** (0.0359)	1.9598*** (0.0359)	10.0529*** (0.1280)	1.7149*** (0.1055)	10.0532*** (0.1280)	1.7215*** (0.1055)

*Note: * significant at 10%; ** significant at 5%; *** significant at 1%.*
Standard errors are in brackets.
Default categories are both parents at hometown, primary school in a village, junior middle school in a village, original housing in a village, no land at hometown, manager or professional staff, manufacturing companies, privately-owned companies.
Provincial and city dummies are not presented in the table.

Table 4 Direct, indirect and total effects on wage

Variables	Direct effects	p-value	Indirect effects	p-value	Total effects	p-value
Education	0.0685	0.000			0.0685	0.000
Father out only	-0.0192	0.327	-0.0185	0.018	-0.0377	0.058
Mother out only	-0.0204	0.721	-0.0393	0.080	-0.0597	0.305
Both parents out	-0.0579	0.000	-0.0155	0.006	-0.0734	0.000
Female	-0.1240	0.000	0.0089	0.025	-0.1151	0.000

Table 5 Relationship between parental migration and wage for females and males

Variables	Female		Male	
Father out only	-0.1874 (0.1632)	-0.0090 (0.0274)	-0.3642** (0.1440)	-0.0294 (0.0277)
Mother out only	-0.4612 (0.4076)	-0.0223 (0.0681)	-0.8998* (0.5110)	-0.0391 (0.0975)
Both parents out	-0.0807 (0.1108)	-0.0674*** (0.0188)	-0.3571*** (0.1015)	-0.0491** (0.0202)
Hk_urbanprimary	0.1869 (0.1763)		0.2006 (0.1685)	
Hk_urbanjunior	0.4456*** (0.0885)		0.5927*** (0.0841)	
Housinghome=housing at township	0.8254*** (0.2073)		0.3955* (0.2056)	
Housinghome=housing at city	0.9180*** (0.2872)		1.3806*** (0.2656)	
Housinghome=others	0.4688*** (0.0868)		0.2103** (0.0874)	
Land 0.01-2.99 mu	-0.1623 (0.1412)		-0.1323 (0.1305)	
Land 3-4.99 mu	-0.3755*** (0.1084)		-0.1090 (0.1030)	
Land 5-6.99 mu	-0.2260* (0.1208)		-0.1157 (0.1101)	
Land 7 and over	-0.3129** (0.1251)		-0.0395 (0.1088)	
Education years		0.0614*** (0.0131)		0.0845*** (0.0148)
Work experience		0.0304*** (0.0053)		0.0443*** (0.0054)
Work experience squared		-0.1480*** (0.0411)		-0.2299*** (0.0417)
Married		-0.0090 (0.0155)		0.1746*** (0.0159)
Service personnel		-0.1556*** (0.0248)		-0.2602*** (0.0229)
Sales personnel		-0.0744* (0.0445)		-0.1055** (0.0515)
Production workers		-0.1288*** (0.0236)		-0.1042*** (0.0206)
Other occupation		-0.1363*** (0.0438)		-0.0596 (0.0470)
Construction sector		0.0214 (0.0778)		0.2112*** (0.0279)
Service sector		0.0382		0.1055***

		(0.0270)		(0.0219)
Other industry		0.0864**		0.0872***
		(0.0357)		(0.0331)
State owned		0.0303		0.0813***
		(0.0261)		(0.0224)
Foreign		0.0732***		0.0443*
		(0.0205)		(0.0245)
Other ownership		0.0731		0.0607
		(0.0584)		(0.0504)
Self-employed		-0.1205***		-0.1294***
		(0.0180)		(0.0188)
Constant	10.5232***	1.7588***	9.8036***	1.4862***
	(0.2018)	(0.1397)	(0.1595)	(0.1587)

*Note: * significant at 10%; ** significant at 5%; *** significant at 1%.*
Standard errors are in brackets.
Default categories are both parents at hometown, primary school in a village, junior middle school in a village, original housing in a village, no land at hometown, manager or professional staff, manufacturing companies, privately-owned companies.
Provincial and city dummies are not presented in the table.