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**NO LONGER LEFT BEHIND:
THE IMPACT OF RETURN
MIGRANT PARENTS ON
CHILDREN'S PERFORMANCE**

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Abstract

Using data from a rural household survey for the People's Republic of China in 2009, we examine the impact of parental migration on children's educational outcomes. Consistent with the findings of a large empirical literature, we find that parental migration has a significantly negative impact on left-behind children's educational outcomes as measured by test scores in Chinese and mathematics. However, unlike many of the existing studies on the subject, we focus on the remediation effect of return migrant parents on once-left-behind children's performance. This empirical strategy allows us to avoid the endogeneity issue concerning the migration decision that may have contaminated previous studies. We find evidence that return migrant parents help alleviate the harm caused by parental migration. We explore two channels through which return migrant parents may improve children's school performance. One is that children spend more time studying following migrant parents' return. The other is that return migrant parents spend more on their children's education. We also find evidence suggesting that the remediation effect is stronger for children attending primary school and for daughters.

Keywords: migration, left-behind children, educational outcomes, People's Republic of China

JEL Classification: J24, O12, O15

Contents

1. INTRODUCTION

The impact of migration on the well-being of left-behind family members has received much attention from both academic scholars and policy makers. However, the literature on international migration and children's educational performance yields mixed results. Many studies find that migration increases the income of household members left behind via remittances, which removes credit constraints in human capital investments. For example, Antman (2012, 2015) finds a positive effect of parental migration to the United States (US) on the educational attainment of left-behind daughters and suggests that the marginal remittances from migrants enable families to support their daughters for more education. Edwards and Ureta (2003) use a hazard model to characterize school retention rates for students whose parents migrated internationally in El Salvador. They find that more remittances significantly reduce the probability of dropping out of school. Beine et al. (2008) find that emigration can be beneficial or detrimental to source countries, even within developing countries. South Africa and Central America experience more losses than gains in human capital development from emigration of skilled labor. However, McKenzie and Rapoport (2011) find the opposite: family migration reduces educational attainment of the majority of rural Mexican children. Nguyen (2016) finds that the impact of migration varies across different countries. Parental migration does not have a significant effect on children in Ethiopia but is detrimental to children's health in India, Peru, and Viet Nam. In terms of educational performance, parental migration is harmful to the development of cognitive ability in children in India and Viet Nam.

The last decade or so has seen large-scale rural–urban migration in the People's Republic of China (PRC). According to the latest *Report on Chinese Migrant Workers* issued by the National Bureau of Statistics of China (2016), there were about 277.5 million rural migrants working or looking for work in cities in 2015. Among them, about 168.8 million were migrants from outside of their host counties.[1] In 2011, more than 12.6 million school-age rural children were living in cities with their migrant parents, and an additional 22 million were left behind in their rural households by their migrant parents (Ministry of Education of China 2012). While this massive rural–urban migration helps reduce rural poverty and increase economic efficiency of the Chinese economy as people move from the agricultural sector, where the marginal product of labor is low, to the urban, industrial, and service sectors, where the marginal product of labor is high, it also generates a profound impact on the well-being of the children of migrants. Economic studies on the effects of migration on the human capital development of left-behind children in rural PRC find generally a negative impact of parental migration on children's educational attainment. There are two main streams of research on left-behind children in rural PRC. One stream focuses on the impact of the absence of parents. Lee (2011) shows that children of migrants are worse-off in terms of school enrollment and years of schooling compared with children of non-migrants. Zhou, Murphy, and Tao (2014) use survey data for Anhui and Jiangxi provinces and find that the adverse effect on educational performance is only significant when both parents migrate and increases with the duration of parental absence. Wang (2014) finds that parental migration has a negative effect on children's school enrollment, especially for boys. She suggests that this is mainly due to the absence of the father, rather than the mother, from the home. Tong et al. (2015) report that left-behind children experience more illness and psychological issues than children living with their parents. Zhang et al. (2014) find that the absence of both migrant parents significantly

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[1] http://www.stats.gov.cn/tjsj/zxfb/201604/t20160428_1349713.html (in Chinese).

reduces the learning and contemporary achievements of left-behind children. However, the effect of the absence of only one parent is insignificant. Meng and Yamauchi (2015) find a sizable adverse impact of exposure to parental migration on children's educational as well as health outcomes. Biavaschi, Giulietti, and Zimmermann (2015) find that parental migration negatively affects children's educational attainment, but this negative effect is in part compensated for by the presence of an older sibling, especially an older sister.

The other stream of research compares left-behind children to children who live with their migrant parents in cities. The latter have limited schooling opportunities in cities because of the household registration system, *hukou*. Enrollment in urban public schools requires local urban *hukou*, which migrant workers and their children do not have. As a result, migrant children are either home-schooled by their parents or attend poorly-funded migrant schools designated for migrant children. Living with migrant parents in cities does not necessarily improve educational outcomes because of the lack of access to the public school system. For instance, based on fieldwork in Shanghai, Chen and Feng (2013) find that migrant children who are unable to enroll in public schools perform significantly worse than their urban counterparts in Chinese and mathematics. Kong and Meng (2010) find that both left-behind children and children of migrants living in cities have worse educational and health outcomes than not only urban children but also rural children of non-migrant parents. Lu and Zhou (2013) find that migrant children enrolled in migrant schools in urban areas perform less well and experience more loneliness than migrant children enrolled in public schools. While these results seem intuitive, they are not always confirmed by other studies. Chen et al. (2009) do not find any significant negative impact of migrant parents on the school performance of left-behind children. More interestingly, Gong et al. (2008) find that left-behind children perform better than children living with their migrant parents in cities. Wu and Zhang (2015), using the Census Population Survey in 1990 and in 2000, conclude that even though migrant children fare significantly worse in educational performance and school enrollment than non-migrant children and urban children, their chances of enrolling in an urban public school improve as they spend more time in cities.

This study examines how return migrant parents affect the educational achievement of their once-left-behind children in rural PRC. Using the second wave of the Rural to Urban Migration in China survey (RUMiC 2009), we focus on three outcome measures: years of schooling, test scores in Chinese, and test scores in mathematics for children aged 7 to 18. We find that parental migration has a significant and adverse impact on left-behind children's educational outcomes. The unique finding of this study is that return migrant parents help reduce the negative effect due to being left behind. These results are obtained after controlling for observed family, parental, and children's characteristics and county fixed effects. We also explore mechanisms for the remediation effect of return migrant parents and find evidence suggesting that it comes from increases in after-school study time and education-related expenditure following the return of migrant parents.[2] We also find evidence suggesting that the remediation effect is stronger for children attending elementary school than for children attending middle school and high school, and is stronger for daughters than for sons.

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[2] In this study, the remediation effect refers to improvement in the school performance of the once-left-behind children after the return of their migrant parents.

The novelty of the current study is twofold. First, by focusing on the impact of return migrant parents on children's performance we avoid the endogeneity issue associated with the parental migration decision. If the migration decision is influenced by children's school performance or unobservable factors that are also correlated with children's performance, the estimated effect of parental migration on left-behind children will be inconsistent. While in principle the return decision may also be endogenous, we eliminate this problem by excluding return migrant parents who reported that they returned for reasons related to their children. The second novelty is that focusing on return migration allows us to offer insights into whether return migrant parents can reverse or remedy the damage experienced by their children once left behind. The answer to this question has important implications about early childhood development. If there is no remediation effect, the negative impact of parental migration is permanent, affecting left-behind children's human capital formation and labor market outcomes. If there is a strong remediation effect, the negative impact of parental migration is transitory. Furthermore, the remediation effect may depend on the age or grade level of left-behind children at the time of their parents' return. In this regard, the timing of the return, rather than the return per se, is critical for undoing the damages due to parental migration.

The remainder of the paper is organized as follows. Section 2 presents briefly the conceptual framework and discusses the potential channels through which return migrant parents may improve the school performance of their once-left-behind children. Section 3 describes the data and some key variables used in the regression analysis. Section 4 presents the empirical results with a discussion on the possible econometric issues and the heterogeneous effects of return migrant parents in several dimensions. The last section concludes this study and discusses possible policy implications.

2. HOW RETURN MIGRANT PARENTS MAY AFFECT CHILDREN'S SCHOOL PERFORMANCE

To motivate our analysis, we borrow the human capital production developed by Heckman (2007). The human capital production is characterized as a developmental technology consisting of two parts: early childhood human capital investment and childhood human capital investment.[3] The investments in the two stages of life can be substitutes or complements to each other. If they are substitutes, lack of investment in the early stage can be compensated for with more investment in the second stage. Conversely, if they are complements, early investment affects the productivity of later investment. In this situation, a lack of investment in early childhood due to an exogenous shock can have a long-term adverse effect on child development. In the context of our research, parental migration can be viewed as a negative shock to left-behind children's human capital formation during childhood. If the parental

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[3] Heckman (2007) and Almond and Currie (2011) suggest a flexible developmental technology in a constant elasticity of substitution function in a two-period human capital investment model, $h = A\left[\gamma I_1^\phi + (1-\gamma)I_2^\phi\right]^{1/\phi}$, where I_1 and I_2 are investment in period 1 and period 2, respectively. A negative shock, $-\mu_g$, in early childhood leads to lower human capital in period 1, such that human capital in the first period is $I_1 - \mu_g$. This negative exogenous shock affects human capital development in a way $\frac{\partial h}{\partial \mu_g} = -\gamma A\left[\gamma(I_1 - \mu_g)^\phi + (1-\gamma)I_2^\phi\right]^{\frac{1}{\phi}}(I_1 - \mu_g)^{\phi-1}$. However, a remediation $\mu'_g > 0$ in period 2 could effectively reverse the damage, and its effectiveness relative to initial damage is determined by $\frac{\frac{\partial h}{\partial \mu'_g}}{\frac{\partial h}{\partial \mu_g}} = -\frac{1-\gamma}{\gamma}\left(\frac{I_1 - \mu_g}{I_2 + \mu'_g}\right)^{1-\phi}$.

investment in the second period is not perfectly complementary with the early investment, return migrant parents can remediate the negative effect of leaving their children behind via a responsive investment. The greater the complementarity of investment across time is, the more limited the remediation effect of return migrant parents will be or the larger the responsive investment required to achieve a certain level of remediation will be. One implication of this production function approach is that the timing of parental return may matter.

There are several potential pathways through which return migrant parents can help boost their children's school performance. The first channel is the income effect of migration. Returning to rural areas with income earned in cities, migrant parents can afford to invest more in their children's education. Meng (2012) finds a positive relationship between children's educational attainment and parental income for children in rural PRC. However, if returning from migration is negatively selected, that is, if unsuccessful migrants tend to return home and receive relatively lower wages, the income effect of parental return on children's educational achievement will be negative.

A second channel is that returned parents can release their children from both household chores and farming work so that they have more time for study. It has been documented that children are more involved in household chores and household production activities in rural PRC when parents migrate to work in cities (Chang et al. 2011; Chen 2013).

The third possible channel is through the change in perception of the value of education for migrant households. Migration experience of working and living in cities may change parents' perceptions on education. By observing a higher level of education in cities and a positive and high return to education, migrant parents may recognize a value of education that is greater than what they perceived before. When they return to rural areas, they have an incentive to devote more resources to their children's education (Lee and Park 2011). Böhme (2015) finds that a caregiver's change in educational aspiration can result in "brain gain" of their family members, especially for those located at the lower end of the human capital distribution.

The fourth channel is parents' direct involvement as a key home input in human capital production for their children. The mere presence of parents at home offers companionship and support could make children more productive in school. Some research has shown that children with strong parental support do well in school and develop strong non-cognitive skills (Ren and Treiman 2016). Parental presence can contribute to children's school performance in the role of supervision and monitoring to ensure their children finish homework assignments each day and to make up for missed classes. Nguyen and Linh (2016) find that Vietnamese children with absent parents tend to spend less time on study at home but more time on leisure and playing. This suggests that parental presence may have consequences on children's time allocation between study and activities other than household chores and farming work.

3. DATA

The empirical analysis is based on the second wave of the Rural to Urban Migration in China project (RUMiC 2009), which is a joint project sponsored by the Institute of Economics, Chinese Academy of Sciences, Asian Development Bank, and the Ford Foundation. Directed by the National Statistics Bureau of China, the China Household Income Project (CHIP) data were collected through a series of questionnaire-based interviews during April–May 2009. The survey includes three independent samples: the Rural Household Survey on 8,000 rural households, the Urban Household Survey on

5,000 urban households, and the Urban Migrant Survey on 5,000 rural-to-urban migrant households. Since the surveys were conducted independently, households from the rural sample cannot be linked to households in the migrant sample, even though the former also includes households whose family members are migrants. The datasets include detailed information of households and household members on education, migration experience, socio-demographic characteristics, and labor market outcomes. The rural survey also contains children's test scores for Chinese and mathematics as well as grade level attendance. We use the rural household sample to ensure that the children we study all grew up in similar external environments in terms of schools, culture, geography, and infrastructure facilities, but different family environments, particularly regarding their parental migration experiences.

We compare school performance among the children of migrant parents, return migrant parents, and non-migrant parents. We define parents who have migration experience and have both been living with their children in the local village for at least 12 months during the past year as returnees.[4] Parents are defined as migrants if at least one of the parents has been living and working outside of their local village for more than 1 month during the past year. Parents who have never migrated are defined as non-migrants. Children of non-migrant parents are used as the benchmark group in all our regressions.

We adopt three measures for educational outcomes. The first is years of schooling, a commonly adopted measure for human capital development in the literature on left-behind children. On the one hand, the absence of parents may adversely affect children's performance, resulting in dropping out of school or repeating a grade or failing to transit from elementary to middle school. Left-behind children may also drop out of school to attend to family farming or to care for other family members. As a result, they complete fewer years of schooling than children in the same age cohort. On the other hand, migration experience could alter parents' perspectives toward education and their willingness to invest in the human capital of their children. As such, children of migrant parents may be less likely to drop out of school and to obtain more schooling.

However, years of schooling as a measure of educational achievement cannot reflect the quality of education or knowledge learnt from school. Moreover, since all children in our sample are aged 18 years or younger, the variation in years of schooling is due largely to variation in age. In other words, there may be little variation in years of schooling once the children's ages are controlled for. Therefore, using years of schooling as the performance indicator, as previous studies have done (Hu 2012; Lee 2011; Lu 2012; Meyerhoefer and Chen 2011), may not capture well how children's education has been affected by parental migration. More importantly, attending school does not necessarily lead to good performance: a left-behind child may attend school diligently but perform poorly.

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[4] This means that parents returned from urban areas at least 1 year ago. One of the reasons to select such a long spell is that migrants who returned in 2008 are possibly temporarily living in rural hometowns due to the financial crisis in 2008. About 80% of migrants returned to cities after the Spring Break of 2009 (National Statistics Bureau of China, http://www.stats.gov.cn/ztjc/ztfx/fxbg/200903/t20090325_16116.html, in Chinese). Therefore, we are not able to separate them from floating migrants. Moreover, the impact of return migration could not be immediate. That is why we restrict the return duration to be longer than 1 year. Alternatively, we use 6 months as the threshold to identify returnees from staying outside migrants. There are 519 returnees according to this new definition, compared to 471 returnees using 12 months of living in the hometowns as thresholds. We get qualitatively the same results, except lose some significance from 5% to 10% in some cases. Moreover, the return duration and migration status are calculated by using May 2009 as the censoring month. The other main variables regarding demographics, including household income, are for the year 2008.

The other two and main performance measures we use are test scores in Chinese and test scores in mathematics for the semester that ended in January 2009. Test scores are better measures for school performance than years of schooling even after controlling for fixed cohort effects. Moreover, under the Chinese education system, test scores are the main determinants of whether a child gets to be admitted into an elite middle or high school, which largely determines whether the child can receive good enough scores at the national college entrance exam to receive college education.

In the PRC, different schools and subjects may adopt different grading schemes. For example, common grading practices are to set the full score as 100, 120, or 150. As such, the reported raw scores could be misleading if the sample children are from different schools. Fortunately, in the rural survey, parents were asked to provide both the raw scores and the specific grading scale used. We use both the raw scores and standardized scores defined as the raw score divided by the maximum obtainable score.

Table 1: Descriptive Statistics by Parental Migration Status

	Non-migrants (1)			Migrants (2)		
Variables	Mean	SD	N	Mean	SD	N
Individual characteristics						
Child's year of schooling	5.62	2.66	1,124	5.38	2.79	254
Score of Chinese exam	85.94	12.81	1,146	82.26	15.64	258
Percent of Chinese exam	81.00	10.59	1,146	76.77	13.40	258
Score of math exam	87.96	14.41	1,156	84.86	17.05	258
Percent of math exam	82.69	11.33	1,156	78.83	13.80	258
Child's gender (male = 1)	0.55	0.50	1,156	0.52	0.50	258
Age of child	12.37	2.84	1,156	11.95	3.21	258
Number of siblings	1.98	0.91	1,156	1.89	0.67	258
Living with grandparents	0.02	0.14	1,156	0.11	0.31	258
Household and parent characteristics						
Father's age	40.62	5.47	1,156	38.67	4.60	258
Father's schooling	8.14	2.37	1,156	7.65	1.95	258
Mother's age	38.98	5.07	1,156	37.83	4.71	258
Mother's schooling	7.08	2.60	1,156	6.81	2.57	258
Father's return months	0.00	0.00	1,156	1.80	11.33	258
Mother's return months	0.00	0.00	1,156	5.29	32.27	258
Log (household income)	1.66	1.62	1,156	2.59	0.88	258
Log (land size) (unit: Mu)	1.45	0.78	1,137	1.60	0.67	257
Log (learning hours)	2.11	0.65	791	1.94	0.63	176
Log (education expenditure)	0.39	0.33	1,031	0.35	0.34	235
Not boarding at school	0.67	0.47	1,136	0.68	0.47	250

Table 1 *continued*

	Returnees			Difference	
	(3)			(2)–(1)	(3)–(2)
Variables	Mean	SD	N	Mean	Mean
Individual characteristics					
Child's year of schooling	5.42	2.61	912	–0.23	0.04
Score of Chinese exam	85.37	15.14	919	–3.68***	3.11***
Percent of Chinese exam	80.28	13.06	919	–4.24***	3.51***
Score of math exam	87.80	14.50	923	–3.10***	2.95***
Percent of math exam	82.63	11.96	923	–3.86***	3.80***
Child's gender (male = 1)	0.57	0.50	923	–0.03	0.05
Age of child	12.12	2.83	923	–0.42	0.17
Number of siblings	1.83	0.78	923	–0.09	–0.06
Living with grandparents	0.23	0.42	923	0.09	0.12***
Household and parent characteristics					
Father's age	38.95	5.40	923	–1.95***	0.28
Father's schooling	8.31	1.90	923	–0.49***	0.66***
Mother's age	37.49	4.88	923	–1.15	–0.33
Mother's schooling	7.37	2.44	923	–0.27**	0.57***
Father's return months	30.08	53.04	923	1.80***	28.28***
Mother's return months	15.06	39.82	923	5.29	9.77***
Log (household income)	2.62	1.20	923	0.93***	0.03
Log (land size) (unit: Mu)	1.53	0.65	917	0.14**	–0.07
Log (learning hours)	2.06	0.73	642	–0.17**	0.13***
Log (education expenditure)	0.37	0.33	833	–0.04	0.03
Not boarding at school	0.67	0.47	901	0.01	0.00

N = number of observations, SD = standard deviation.

Note: ***, **, and * represent significance levels of 1%, 5%, and 10% for the two sample mean difference test, respectively.

Table 1 presents the descriptive statistics of the variables by parental migration status. Non-migrants' children obtain more years of schooling than their counterparts in the other two groups, but the difference is not significant. Children of return migrant parents receive the least number of years of schooling. Children of non-migrant parents have the highest average test scores in both subjects, followed by children of return migrant parents and then left-behind children. Children of return migrant parents are significantly better in both Chinese and mathematics than those of migrant parents. And migrants' children (left-behind children) on average are associated with the lowest education achievements. The average age of children is 12 and the standard deviation of age is 3 years, indicating that the majority of the students are subject to the compulsory education policy. A significant number of students are at the age of entering middle school. For these children, test scores are of particular importance.

There are significant differences in study inputs, such as study time and education-related expenditures among rural parents. Returnees spend significantly more than non-migrants on education-related activities. Considering migrants earn significantly more than non-migrants, the proportion of education investment over the household income is much lower. Non-migrants earn less, but their children achieve higher scores, indicating that higher income does not compensate for the absence of parents

in children's education performance. Returnees earn as much income as migrants and also invest as much in education as migrants, but their children spend significantly more time in study than migrants' children. Left-behind children spend the least financial resources and time on education.

4. EMPIRICAL MODEL AND STRATEGY

Our empirical model setup is based on a human capital production function, which assumes the school performance of a child to be a function of their own inputs, family inputs, and school inputs. Parents' absence from home can affect children's performance through its influence on children's own inputs (such as time spent on studying), family inputs (such as education-related expenditure and parental supervision and monitoring). Following the relevant literature, we adopt the following reduced-form model to assess the effect of parental migration status on children's school performance:

$$S_i^c = \beta_1 M_i^p + \beta_2 R_i^p + \boldsymbol{\gamma_m X_i^c} + \boldsymbol{\gamma_p X_i^p} + C_i + u_i \tag{1}$$

where S_i^c is a performance indicator for child i, M_i^p and R_i^p indicate, respectively, migrant parents and return migrant parents, $\boldsymbol{X_i^c}$ and $\boldsymbol{X_i^p}$ are, respectively, vectors of children's and parental characteristics, C_i is county fixed effects (capturing school inputs and other county characteristics that may be correlated with children's performance, and u_i is the random error. Superscript *c* denotes children and superscript *p* denotes parents. Children's characteristics include gender, age, number of siblings, and whether they live with their grandparents. Parental characteristics include educational attainment, the ages of both parents, and family income.

In equation (1), *β₁* measures the effect of migrant parents and *β₂* the effect of return migrant parents on children's performance. However, if the migration decision and return decision are correlated with the error term, OLS estimates of the parameters will be biased or inconsistent. Addressing this econometric issue has been a central concern for the many existing studies in the literature. We avoid this problem by focusing on the comparison of children of return migrant parents with children of non-migrants using the following regression model:

$$S_i^c = \beta_3 R_i^p + \boldsymbol{\delta_m X_i^c} + \boldsymbol{\delta_p X_i^p} + C_i + \epsilon_i. \tag{2}$$

Suppose that the absence of parents does have a negative impact on children's performance. The return of migrant parents, hence the presence of parents, should help improve their once-left-behind children's performance. Therefore, the finding of a comparable school performance between children of return migrant parents and children of non-migrants is an indirect piece of evidence for the adverse effect of being left behind. This would be the case if *β₃* of equation (2) is zero. Of course, a finding of a negative *β₃* does not necessary lead to the rejection of the hypothesis of an adverse effect of being left behind since it may take time for the remediation effect of return migrant parents to materialize. In principle, the return decision could be endogenous as well. In principle, the return decision could be endogenous if migrant parents return to their home villages because of their children's school performance. For example, based on a survey in a county in the PRC, Démurger and Xu (2015) find that migrant parents tend to delay their return if their children are still in primary school in order to accumulate more savings.

Fortunately, we have information on the reasons behind the return decision. The two top reasons are (1) the need to take care of a home business or household farming work and (2) being dismissed and unable to find a job. Together, these reasons account for 40% of return migrant parents in our sample. Looking after children was given as a distinct reason, and only 9% of return migrant parents cited it as the reason. We exclude these parents from our regression analyses so that the return decision is exogenous in equation (2). Therefore, OLS estimates will be unbiased and consistent.

To check the validation of the interpretation of β_3 in equation (2), we also estimate the effect of migrant parents on the school performance of left-behind children using the following regression model:

$$S_i^c = \beta_4 M_i^p + \boldsymbol{\theta_m} X_i^c + \boldsymbol{\theta_p} X_i^p + C_i + v_i. \tag{3}$$

We deal with the potential correlation between M_i^p and v_i in the framework of the endogenous treatment model. In this framework, the disturbance term, v_i, is separated into components as $v_i = w\eta_i + e_i$, where η_i is correlated with M_i^p, and e_i is not. The estimation proceeds in two steps. First, we estimate the migration decision using the probit model and use the predicted values to create the generalized inverse Mills ratio, which is an estimate of η_i. In step two, we plug the inverse Mills ratio into equation (3) and estimate the equation via OLS to obtain consistent estimates for β_4.[5]

5. RESULTS

5.1 Estimating the Effect of Parental Migration on Children's Performance

While the large majority of studies find that left-behind children perform less well than children whose parents are present in their rural families, there are studies finding the opposite. To link with the literature we begin by comparing the school performance of children of migrant parents with that of children of non-migrant parents by estimating equation (3). Table 2 presents the OLS estimates.

With the exception of years of schooling as the outcome variable, children of migrants indeed perform worse than children of non-migrant parents in Chinese and math tests. The estimates are statistically significant at the 10% level or higher, although they suggest only about a 2–3 point difference in test scores.

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[5] One assumption required by the endogenous treatment model is that the parameters on the **X**s are independent of parental migration status, which is our maintained assumption. See Vella (1998) for a detailed discussion of endogenous treatment models. Because of non-linearity in the generalized inverse Mills ratio, constructed on both the sample of migrants and the sample of non-migrants, an exclusion variable is not required. However, we include the log of the land size of the children's family in constructing the inverse Mills ratio in the first stage. Parents with more land were significantly less likely to migrate to cities.

Table 2: The Effect of Parental Migration: Migrant Parents versus Non-migrant Parents

Variables	(1) Schooling	(2) Chinese	(3) Chinese (100)	(4) Math	(5) Math (100)
Migrants	0.0768	−1.743*	−1.843**	−2.806**	−2.864***
	(0.102)	(1.049)	(0.871)	(1.232)	(0.955)
Father's age	−0.0162	−0.174	−0.133	−0.141	−0.0994
	(0.0113)	(0.142)	(0.119)	(0.150)	(0.103)
Father's education	−0.0137	0.392**	0.544***	0.197	0.331**
	(0.0172)	(0.163)	(0.132)	(0.197)	(0.154)
Mother's age	0.0252**	0.109	0.000785	0.0296	−0.114
	(0.0112)	(0.154)	(0.133)	(0.155)	(0.110)
Mother's education	0.0156	0.269	0.356**	0.237	0.202
	(0.0157)	(0.179)	(0.140)	(0.207)	(0.154)
Log (household annual income)	0.0237	0.628**	0.000203	1.066***	0.475**
	(0.0295)	(0.274)	(0.216)	(0.309)	(0.225)
Boy	0.00272	−0.913	−1.620***	−0.301	−0.993*
	(0.0686)	(0.657)	(0.524)	(0.764)	(0.581)
Child's age	0.826***	0.273**	−0.837***	0.377***	−0.793***
	(0.0126)	(0.128)	(0.103)	(0.146)	(0.119)
Number of siblings	−0.0434	0.212	−0.163	−0.182	−0.422
	(0.0557)	(0.492)	(0.380)	(0.549)	(0.438)
Living with grandparents	−0.179	−2.376	−1.279	1.559	2.494
	(0.171)	(2.230)	(2.068)	(1.850)	(1.546)
Constant	−5.024***	79.96***	92.54***	84.48***	100.2***
	(0.419)	(3.804)	(3.046)	(4.418)	(3.390)
Observations	1,499	1,433	1,427	1,422	1,414
R-squared	0.800	0.274	0.318	0.242	0.284

Note: County fixed effects are included in all regressions. ***, **, and * represent significance levels of 1%, 5%, and 10%, respectively. Standard errors are in parentheses and are heteroskedasticity robust. The sample includes children of migrants and children of non-migrants (the base group), excluding children of return migrants.

There are several significant control variables. Parental educational attainment is positively related to children's performance. While a father's education background affects both Chinese and math scores, a mother's education has a significant effect only on Chinese test scores. Household income is positively related to performance, as expected. Boys perform worse than girls, significantly so in terms of standardized scores. A child's age is positively related with the raw test scores but negatively related with the standardized test scores. This is likely a mere reflection of the different grading systems adopted by primary and middle schools. In the PRC, primary schools usually grade students on a 0–100 scale, while middle schools and high schools may set the maximum score at 100, 120, 150, or any other number. Therefore, for middle school and high school children, standardized test scores are a more meaningful measure of performance. The negative correlation between age and standardized scores may also be a result of the fact that the course content becomes progressively more difficult as students move up in grade levels and from primary to middle schools. All other covariates (parents' age, number of siblings, and whether they live with grandparents) are not significant.

However, if the parental migration decision is correlated with the error term in equation (3), the OLS estimates will be biased or inconsistent. As outlined in the previous section, we address this problem by adding the generalized inverse Mills ratio in equation (3). Table 3 contains the estimates with corrections for the endogenous migration decision. Overall these estimates are qualitatively in conformity with those reported in Table 2. But accounting for the endogenous migration decision does lead to sizable increases in the estimated effects of being left behind. Specifically, the standardized test scores of children of migrants are 7–12 points lower than those of children of non-migrants. However, the generalized inverse Mills ratio is statistically significant for the raw test scores, not the standardized test scores. While there are no obvious explanations for why the endogeneity of the migration decision depends on whether the test scores are standardized or not, the negative impact of being left behind is evident. Furthermore, since the estimates with correction are larger (in absolute value) than the estimates without correction in Table 2, the latter can be viewed as the lower bound or a more conservative estimated effect of being left behind on children's performance.

Table 3: The Effect of Parental Migration: Migrant Parents versus Non-migrant Parents with Correction for Endogenous Migrant Status

Variables	(1) Schooling	(2) Chinese	(3) Chinese (100)	(4) Math	(5) Math (100)
Migrants	0.0399	−10.79***	−6.803**	−11.63***	−7.184**
	(0.365)	(3.977)	(3.414)	(4.482)	(3.567)
Father's age	0.00288	−0.119	−0.159	−0.126	−0.112
	(0.0130)	(0.157)	(0.141)	(0.169)	(0.119)
Father's education	−0.0182	0.0641	0.369**	−0.0916	0.193
	(0.0200)	(0.186)	(0.156)	(0.232)	(0.189)
Mother's age	0.00939	0.00335	−0.00695	−0.0285	−0.139
	(0.0121)	(0.168)	(0.158)	(0.169)	(0.125)
Mother's education	0.0288*	0.540***	0.445***	0.608***	0.339*
	(0.0173)	(0.187)	(0.153)	(0.226)	(0.174)
Log (household annual income)	0.00236	1.490***	0.506	2.016***	1.043***
	(0.0488)	(0.452)	(0.358)	(0.518)	(0.394)
Boy	0.0353	−1.048	−1.515***	−0.305	−0.583
	(0.0762)	(0.714)	(0.576)	(0.842)	(0.643)
Child's age	0.829***	0.388***	−0.780***	0.489***	−0.745***
	(0.0135)	(0.137)	(0.109)	(0.159)	(0.130)
Number of siblings	−0.0369	0.994*	0.385	0.694	0.203
	(0.0675)	(0.539)	(0.433)	(0.611)	(0.522)
Living with grandparents	−0.165	−0.120	0.203	3.976*	3.789**
	(0.208)	(2.582)	(2.418)	(2.355)	(1.903)
Constant	−5.274***	79.83***	92.97***	82.43***	99.65***
	(0.468)	(4.069)	(3.384)	(4.920)	(3.839)
Inverse Mill's ratio	0.0529	5.592**	3.029	5.338**	2.507
	(0.212)	(2.305)	(2.043)	(2.673)	(2.126)
Observations	1,215	1,163	1,160	1,154	1,149
R-squared	0.802	0.277	0.329	0.231	0.283

Note: County fixed effects are included in all regressions. ***, **, and * represent significance levels of 1%, 5%, and 10%, respectively. Standard errors are in parentheses and are heteroskedasticity robust. The sample includes children of migrants and children of non-migrant parents (the base group), excluding children of return migrants.

5.2 Estimating the Effect of Return Migrant Parents
on Children's Performance

We next estimate the effect of returning migrant parents on children's school performance. One way to do this is to estimate equation (1) using a pooled sample, including children of return migrant parents, migrants, and non-migrants. Table 4 presents the OLS estimates.

Table 4: The Effects of Parental Migration and Return

Variables	(1) Schooling	(2) Chinese	(3) Chinese (100)	(4) Math	(5) Math (100)
Migrants	0.0529	−1.788*	−1.759**	−2.618**	−2.707***
	(0.0940)	(1.042)	(0.885)	(1.136)	(0.894)
Returnees	0.0175	−0.656	−0.791	−0.915	−0.663
	(0.0625)	(0.709)	(0.588)	(0.762)	(0.590)
Father's age	−0.0123	−0.284**	−0.221*	−0.0741	−0.0180
	(0.00774)	(0.143)	(0.133)	(0.109)	(0.0850)
Father's education	0.0132	0.366**	0.556***	0.233	0.362***
	(0.0144)	(0.143)	(0.121)	(0.165)	(0.129)
Mother's age	0.0258***	0.209	0.0861	−0.00192	−0.130
	(0.00799)	(0.141)	(0.130)	(0.118)	(0.0939)
Mother's education	0.00936	0.227	0.255**	0.220	0.197
	(0.0116)	(0.144)	(0.124)	(0.153)	(0.120)
Log (household annual income)	0.0238	0.644***	0.179	1.060***	0.546***
	(0.0229)	(0.227)	(0.192)	(0.241)	(0.183)
Boy	−0.0296	−1.703***	−1.557***	−0.607	−0.494
	(0.0494)	(0.539)	(0.453)	(0.587)	(0.462)
Child's age	0.825***	0.311***	−0.810***	0.376***	−0.783***
	(0.00962)	(0.101)	(0.0852)	(0.113)	(0.0937)
Number of siblings	−0.0708*	0.119	0.241	−0.116	0.00588
	(0.0415)	(0.412)	(0.329)	(0.441)	(0.353)
Living with grandparents	−0.188**	−2.082*	−1.432	0.414	1.095
	(0.0769)	(1.070)	(0.989)	(0.891)	(0.759)
Constant	-5.140***	81.46***	91.60***	82.26***	94.55***
	(0.322)	(3.181)	(2.860)	(3.504)	(2.996)
Observations	2,466	2,373	2,366	2,349	2,337
R-squared	0.813	0.232	0.242	0.199	0.226

Note: County fixed effects are included in all regressions. ***, **, and * represent significance levels of 1%, 5%, and 10%, respectively. Standard errors are in parentheses and are heteroskedasticity robust. The sample includes children of migrants, children of return migrant parents, and children of non-migrant parents (the base group).

The estimated effect of parental migration is remarkably similar to those reported in Table 2; left-behind children perform significantly worse than children of non-migrants. The estimates associated with other covariates are also qualitatively similar.

The estimated coefficient on return migrant parents, our primary interest, is negative and far from being significant at any conventional level across all five regression models. Statistically speaking, children of return migrant parents perform as well as children of non-migrants and perform significantly better than children of migrant parents. Since children of return migrant parents were once left behind (i.e., they were children of migrant parents), we ascribe their superior performance relative to left-behind children to the change of their parents' migration status. In other words, returned migrant parents can remediate the negative impact of being left behind on children's school performance. This interpretation would be questionable if children's performance is the main reason for parents' return. To avoid this type of endogeneity bias, we exclude children whose parents returned to a rural village for any reasons related to their children.

Table 5: The Effects of Parental Migration and Return with Correction for Endogenous Migrant Status

Variables	(1) Schooling	(2) Chinese	(3) Chinese (100)	(4) Math	(5) Math (100)
Migrants	−0.0533	−6.389*	−4.993	−3.583	−2.630
	(0.289)	(3.458)	(3.128)	(3.604)	(2.977)
Returnees	−0.0981	−5.321	−4.091	−1.889	−0.545
	(0.283)	(3.326)	(3.039)	(3.492)	(2.806)
Father's age	−0.0137*	−0.290**	−0.220	−0.0780	−0.0155
	(0.00781)	(0.145)	(0.135)	(0.111)	(0.0866)
Father's education	0.0132	0.307**	0.522***	0.238	0.388***
	(0.0145)	(0.155)	(0.133)	(0.177)	(0.141)
Mother's age	0.0267***	0.196	0.0787	−0.00238	−0.126
	(0.00809)	(0.143)	(0.131)	(0.120)	(0.0947)
Mother's education	0.0107	0.276*	0.286**	0.240	0.201
	(0.0118)	(0.147)	(0.126)	(0.156)	(0.124)
Log (household annual income)	0.0330	1.169***	0.532	1.161***	0.513
	(0.0381)	(0.442)	(0.415)	(0.437)	(0.362)
Boy	−0.0245	−1.708***	−1.626***	−0.592	−0.552
	(0.0499)	(0.548)	(0.461)	(0.595)	(0.468)
Child's age	0.825***	0.321***	−0.812***	0.379***	−0.796***
	(0.00972)	(0.102)	(0.0855)	(0.115)	(0.0942)
Number of siblings	−0.0729*	0.0266	0.130	−0.115	−0.0244
	(0.0425)	(0.434)	(0.346)	(0.463)	(0.371)
Living with grandparents	−0.163*	−1.150	−0.755	0.561	0.990
	(0.0941)	(1.243)	(1.126)	(1.126)	(0.928)
Constant	−5.111***	82.86***	92.51***	82.27***	94.27***
	(0.333)	(3.479)	(3.135)	(3.944)	(3.357)
Inverse Mill's ratio	0.0706	2.851	2.023	0.604	−0.0513
	(0.164)	(1.958)	(1.786)	(2.085)	(1.700)
Observations	2,438	2,343	2,336	2,319	2,307
R-squared	0.812	0.231	0.239	0.196	0.223

Note: County fixed effects are included in all regressions. ***, **, and * represent significance levels of 1%, 5%, and 10%, respectively. Standard errors are in parentheses and are heteroskedasticity robust. The sample includes children of migrants, children of return migrant parents, and children of non-migrant parents (the base group).

If the migration decision is correlated with the error term in equation (1), the OLS estimates of returnees will also be biased or inconsistent. To assess the extent of such a bias, we re-estimate all the models in Table 4 with the generalized inverse Mills ratio added. The results are presented in Table 5. With the correction for endogenous migration, the estimated effect of return migrant parents remains negative across all models but is insignificant, similar to the estimates in Table 4, which indicates that the remediation effect of return migrant parents is robust.

The estimated effect of being left behind loses statistical significance with the sole exception of the raw Chinese score regression. However, the validity of these estimates is questionable since the inverse Mills ratio is not statistically significant in any of the regression models.

Another way of assessing the effect of return migrant parents is to estimate equation (2) using the subsample of children of return migrants and non-migrants. Table 6 contains the OLS estimates. The estimated coefficients on return migrant parents are comparable in magnitude to their counterparts in Table 4. None of them are statistically significant at any conventional levels.

Table 6: The Effect of Parental Migration: Returned Migrant Parents versus Non-migrant Parents

Variables	(1) Schooling	(2) Chinese	(3) Chinese (100)	(4) Math	(5) Math (100)
Returnees	−0.00375	−0.693	−0.660	−0.884	−0.393
	(0.0637)	(0.722)	(0.591)	(0.782)	(0.606)
Father's age	−0.0163**	−0.332**	−0.246*	−0.131	−0.0402
	(0.00808)	(0.150)	(0.141)	(0.113)	(0.0886)
Father's education	0.0170	0.377**	0.572***	0.274	0.390***
	(0.0151)	(0.152)	(0.129)	(0.173)	(0.135)
Mother's age	0.0292***	0.216	0.0925	0.0335	−0.104
	(0.00847)	(0.146)	(0.134)	(0.123)	(0.0981)
Mother's education	0.00117	0.0575	0.188	0.0401	0.126
	(0.0122)	(0.157)	(0.136)	(0.163)	(0.128)
Log (household annual income)	0.0241	0.664***	0.123	1.134***	0.532***
	(0.0235)	(0.235)	(0.196)	(0.246)	(0.189)
Boy	−0.0378	−1.819***	−1.542***	−0.587	−0.372
	(0.0518)	(0.573)	(0.480)	(0.616)	(0.487)
Child's age	0.837***	0.339***	−0.810***	0.447***	−0.757***
	(0.0103)	(0.109)	(0.0905)	(0.121)	(0.0989)
Number of siblings	−0.0713	0.242	0.373	−0.0939	0.0578
	(0.0434)	(0.427)	(0.339)	(0.453)	(0.360)
Living with grandparents	−0.149*	−1.747	−1.149	0.187	0.763
	(0.0789)	(1.062)	(0.971)	(0.948)	(0.796)
Constant	−5.070***	83.92***	92.61***	83.17***	94.18***
	(0.328)	(3.223)	(2.949)	(3.555)	(3.093)
Observations	2,192	2,107	2,100	2,089	2,079
R-squared	0.816	0.223	0.229	0.198	0.210

Note: County fixed effects are included in all regressions. ***, **, and * represent significance levels of 1%, 5%, and 10%, respectively. Standard errors are in parentheses and are heteroskedasticity robust. The sample includes children of return migrant parents and children of non-migrants (the base group), excluding children of migrants.

As a robustness check, we assume the parental decision to terminate migration is somehow correlated with the error term in equation (2) and add the inverse Mills ratio as an additional explanatory variable. As the estimates in Table 7 show, accounting for an endogenous return decision does not change the conclusion that children of return migrant parents perform equally well as children of non-migrants. It should be emphasized that the inverse Mills ratio is not significant in any of the regression models, suggesting parental decision to end migration is exogenous as far as children's school performance is concerned.

Table 7: The Effect of Parental Migration: Migrant Parents versus Non-migrant Parents with Correction for Endogenous Migrant Status

Variables	(1) Schooling	(2) Chinese	(3) Chinese (100)	(4) Math	(5) Math (100)
Returnees	−0.000256	−4.491	−3.300	−0.0252	1.655
	(0.317)	(3.612)	(3.188)	(3.791)	(3.124)
Father's age	−0.0175**	−0.329**	−0.238*	−0.130	−0.0334
	(0.00816)	(0.153)	(0.143)	(0.114)	(0.0900)
Father's education	0.0184	0.344**	0.558***	0.303*	0.440***
	(0.0151)	(0.161)	(0.137)	(0.181)	(0.143)
Mother's age	0.0303***	0.200	0.0826	0.0357	−0.0953
	(0.00861)	(0.148)	(0.135)	(0.125)	(0.0992)
Mother's education	0.00162	0.104	0.217	0.0422	0.109
	(0.0125)	(0.160)	(0.139)	(0.166)	(0.132)
Log (household annual income)	0.0199	1.048**	0.368	1.038**	0.300
	(0.0391)	(0.440)	(0.402)	(0.434)	(0.368)
Boy	−0.0306	−1.784***	−1.589***	−0.568	−0.449
	(0.0524)	(0.581)	(0.485)	(0.623)	(0.492)
Child's age	0.836***	0.355***	−0.811***	0.450***	−0.771***
	(0.0104)	(0.111)	(0.0912)	(0.123)	(0.0998)
Number of siblings	−0.0695	0.157	0.267	−0.0380	0.0850
	(0.0451)	(0.455)	(0.358)	(0.479)	(0.383)
Living with grandparents	−0.151	−0.772	−0.459	−0.0640	0.221
	(0.110)	(1.384)	(1.177)	(1.352)	(1.097)
Constant	−5.084***	84.64***	93.02***	82.53***	93.22***
	(0.337)	(3.437)	(3.131)	(3.876)	(3.364)
Inverse Mill's ratio	−0.00106	2.325	1.625	−0.505	−1.220
	(0.183)	(2.136)	(1.888)	(2.277)	(1.908)
Observations	2,165	2,078	2,071	2,060	2,050
R-squared	0.814	0.221	0.225	0.194	0.206

Note: County fixed effects are included in all regressions. ***, **, and * represent significance levels of 1%, 5%, and 10%, respectively. Standard errors are in parentheses and are heteroskedasticity robust. The sample includes children of return migrant parents and children of non-migrants (the base group), excluding children of migrants.

5.3 Heterogeneity of the Remediation Effect of Return Migrant Parents

Panel A of Table 8 presents the estimated effect of return migrant parents separately for primary school and middle school (and high school) children. All the estimates, except for the one associated with the standardized Chinese score regression, are insignificant, consistent with the results of Table 6. This suggests that if migrant parents return to rural villages, they are able to remediate the harm caused by being absent from home. If they return before their children are in middle school, they can improve their children's performance in math but not Chinese to the level comparable to that of children of non-migrants.

Table 8: The Effect of Parental Migration Status on Children's School Performance by Grade Level

	Chinese	Chinese (100)	Math	Math (100)
Panel A: Estimates for returned parents				
Elementary school	–0.175	–0.00476	–0.136	0.216
	(0.802)	(0.767)	(0.805)	(0.741)
Middle school	–1.777	–1.870**	–1.403	–0.862
	(1.376)	(0.930)	(1.521)	(1.038)
Panel B: Estimates for migrant parents				
Elementary school	–0.726	–1.180	–0.951	–1.685
	(1.273)	(1.192)	(1.358)	(1.210)
Middle school	–2.502	–1.898	–3.780	–3.073**
	(1.945)	(1.314)	(2.381)	(1.437)
Panel C: Estimates for migrant parents with correction for endogenous migrant status				
Elementary school	–4.947	–0.436	–5.529	–3.719
	(4.950)	(4.943)	(5.734)	(5.513)
Inverse Mill's ratio	2.610	–0.367	2.572	1.102
	(2.815)	(2.843)	(3.346)	(3.192)
Middle school	–13.74**	–0.293	–25.53***	–7.935*
	(6.477)	(4.069)	(6.874)	(4.226)
Inverse Mill's ratio	6.916*	–1.612	13.36***	2.464
	(3.878)	(2.535)	(4.123)	(2.375)

Note: County fixed effects are included in all regressions. ***, **, and * represent significance levels of 1%, 5%, and 10%, respectively. Standard errors are in parentheses and are heteroskedasticity robust. Estimates in Panel A are based on the sample of children of return migrant parents and children of never-migrated parents (the base group). Estimates in Panels B and C are based on the sample of children of migrants and children of never-migrated parents (the base group). All the covariates included in Tables 2–7 are included in these regressions, but their coefficient estimates are not reported.

To validate this inference, we compare the performance of left-behind children with children of non-migrants by grade level. Panel B presents the OLS estimates and Panel C presents the estimates with correction for an endogenous migration decision. Although none of the estimates based on primary school children are statistically significant, each one of them is less than its corresponding counterpart in Panel A. This is quantitatively supportive of the notion that return migrant parents help remediate the harm on children's performance due to parental absence.

Table 9 presents the effect of return migration parents (in Panel A) and the effect of migrant parents (in Panels B and C) for boys and girls, respectively. First, the estimates in Panel A are smaller than their counterparts in Panel B, with the sole exception of the raw Chinese score for boys. This is consistent with the remediation effect of return migrant parents. Second, the estimates in Panel B suggest that parental migration harms daughters more than sons. The performance of girls continues to lag behind, significantly so for mathematics in comparison with daughters of non-migrants. Third, if we use the estimates with correction for an endogenous migration decision (Panel C) as the benchmark for the harm caused by being left behind, the remediation effect of parental return is much larger.

Table 9: The Effect of Parental Migration Status by Children's School Performance by Gender

	Chinese	Chinese (100)	Math	Math (100)
Panel A: Estimates for returned parents				
Boys	−1.747*	−0.645	−0.522	0.872
	(0.998)	(0.848)	(1.080)	(0.797)
Girls	0.405	−1.135	−1.179	−2.314**
	(1.033)	(0.802)	(1.175)	(0.949)
Panel B: Estimates for migrant parents				
Boys	−0.723	−1.806	−1.467	−2.668*
	(1.625)	(1.257)	(1.848)	(1.366)
Girls	−2.655**	−2.031*	−4.051**	−3.017**
	(1.311)	(1.210)	(1.630)	(1.372)
Panel C: Estimates for migrant parents with correction for endogenous migrant status				
Boys	−10.05	−7.930	−15.99**	−11.36*
	(6.230)	(4.970)	(7.250)	(5.969)
Inverse Mill's ratio	5.908	3.906	8.777**	5.143
	(3.604)	(2.877)	(4.357)	(3.565)
Girls	−7.025	−2.450	−6.761	−3.538
	(4.935)	(4.756)	(5.526)	(4.188)
Inverse Mill's ratio	2.696	0.0874	1.516	0.0640
	(2.931)	(2.996)	(3.403)	(2.612)

Note: County fixed effects are included in all regressions. ***, **, and * represent significance levels of 1%, 5%, and 10%, respectively. Standard errors are in parentheses and are heteroskedasticity robust. Estimates in Panel A are based on the sample of children of return migrant parents and children of never-migrated parents (the base group). Estimates in Panels B and C are based on the sample of children of migrants and children of never-migrated parents (the base group). All the covariates included in Tables 2–7 are included in these regressions, but their coefficient estimates are not reported.

5.4 Channels for the Remediation Effect

In Section 2 we discussed four possible channels through which return migrant parents can help their once-left-behind children their improve school performance. Here we explore two: time for study and expenditure on education.

Panel A of Table 10 presents the estimated effects of return migrant parents on children's time devoted to study and expenditure on education, including tuition, fees, and payments for remedial courses. The estimate (–0.00272 and statistically insignificant) on study time suggests that children of return migrant parents spend as much time on studying as children of non-migrants. The corresponding estimated effect of migrant parents (in Panels B and C) suggests that left-behind children spend at least 16% less time on studying than children of non-migrants do. The gain in study time following parents' return may come from reduced involvement on the part of children in household chores and farming work. It may also be due to reduced playing time resulting from parental supervision and monitoring.

Table 10: The Effect of Return Migrant Parents on Children's Study Time and Education-related Expenditures

	Study time (in log)	Education Expenditure (in log)
Panel A: Returned migrants versus non-migrant parents		
Returned migrants	–0.00272	0.0319**
	(0.0404)	(0.0148)
Panel B: Migrants versus non-migrant parents		
Migrants	–0.159***	0.0007
	(0.0616)	(0.0230)
Panel C: Migrants versus non-migrant parents with correction for endogenous migrant status		
Migrants	–0.635***	0.102
	(0.219)	(0.0841)
Inverse Mills ratio	0.269**	–0.0651
	(0.127)	(0.0497)

Note: County fixed effects are included in all regressions. ***, **, and * represent significance levels of 1%, 5%, and 10%, respectively. Standard errors are in parentheses and are heteroskedasticity robust. Estimates in Panel A are based on the sample of children of return migrant parents and children of never-migrated parents (the base group). Estimates in Panels B and C are based on the sample of children of migrants and children of never-migrated parents (the base group). All the covariates included in Tables 2–7 are included in these regressions, but their coefficient estimates are not reported.

The estimates from the education expenditure regressions indicate that return migrant parents spend on average 3.2% more than non-migrant parents on their children's education. Migrant parents spend about an equal amount on their children's education as non-migrant parents do. This increase in education expenditure is not due to increases in income, as we control for household income in all the regressions. The increase may be a responsive investment made by return migrant parents to remediate the harm caused by leaving their children behind. It may also be due to the change in perception of the value of education on the part of return migrant parents.

6. CONCLUDING REMARKS

This study examines whether return migrant parents have a positive effect on children's school performance measured by test scores in Chinese and mathematics. Using data from a rural household survey in the PRC for 2009, we first estimate the impact of parental migration on children's performance and find the impact is negative and statistically significant, consistent with the findings of a large empirical literature. We then focus on estimating the remediation effect of return migrant parents on

once-left-behind children's performance. The finding of any remediation effects due to the return of migrant parents can serve as indirect evidence for the harmful effects of being left behind. This empirical strategy allows us to avoid the endogeneity issue concerning the migration decision that may have contaminated previous studies. Our regression analyses suggest that return migrant parents help remediate the harm caused by parental migration. We explore two channels through which return migrant parents may improve children's test scores. We find that once-left-behind children spend more time studying following the return of migrant parents. We also find that return migrant parents spend more on their children's education than migrant parents or non-migrant parents.

The finding that parental presence has a remediation impact on the educational achievements of their once-left-behind children highlights the importance of actions taken by parents in mitigating the effects of parental absence. We decipher whether the remediation effect depends on the timing of parental return and varies for sons and daughters. We find evidence suggesting that the remediation effect is stronger for children attending elementary schools and relatively stronger for daughters. The latter is partly because the harm of parental migration is greater for daughters than for sons.

Our study points to the literature regarding early intervention, which shows that early intervention before school age has a long-lasting effect on schooling attainment but may not result in a lasting increase in cognitive test scores (Almond and Currie 2011). Our study, therefore, supplements the literature by providing empirical evidence of a positive effect of parent return from migration on cognitive test scores from a large developing country. Furthermore, our study is also related to the literature on the impact of maternal employment on children's human capital development. Many studies find a negative correlation between maternal employment and children's education. For example, Ruhn (2004) finds that maternal employment during the first 3 years of the child's life has a larger negative impact on the reading and mathematics achievements of 5-year-olds and 6-year-olds. In our case, parent's migrating to cities and working away from hometowns is detrimental to their left-behind children's human capital development. Fortunately, parental return from migration alleviates this deleterious effect. However, to what extent and how maternal and paternal employment after return affect children's cognitive and possibly non-cognitive attainments are open questions. We plan to explore these issues in future studies.

The last decade or so has seen a massive rural-to-urban migration in the PRC, which has helped increase the income and welfare of rural residents. However, urban–rural income inequality remains large and has even widened in recent years (Zhu and Luo 2014). Since the poor performance of left-behind children can further aggravate the existing urban–rural gap in education, urban–rural income inequality may persist into the next generation. This raises concerns about development and education progress in rural areas for policy makers. Our findings that the return of migrant parents could remediate the negative impact of being left behind on school-age children may suggest that the government could design policies that attract migrants back to the rural area. If there are more job opportunities in local areas, rural parents will not need to migrate to cities for jobs. One such policy is to create employment opportunities by encouraging entrepreneurship. As pointed out by Yu et al. (2016), local governments could lower entrepreneurial entry barriers and therefore facilitate job creation by improving infrastructure and other economic conditions. Policies like these can indirectly boost the educational performance of school-age children.

Rural parents tend to underinvest in children's education in terms of both study time and monetary expenses as they do not see or understand the value of education. Experimental studies have shown that students perform better after they are given information about the return to education or after they are told that the return to education is higher than what they perceived it to be (Nguyen 2008; Jensen 2010). We argue that return migrant parents spend more on their children's education in part because they have learned the true value of education through their migration experiences. From a policy perspective, this suggests that a simple policy of informing people about the value of education can go a long way in motivating rural parents to increase investments in their children's education.

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