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THE IMPACT OF PRIMARY SCHOOL INVESTMENT REALLOCATION ON EDUCATIONAL ATTAINMENT IN RURAL AREAS OF THE PEOPLE'S REPUBLIC OF CHINA

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Abstract

In this paper we analyze the effect of removing village-level primary schools and effectively merging these into larger township-level schools on educational attainment in rural areas of the People's Republic of China (PRC). We employ individual- and village-level information from the China Household Ethnic Survey (CHES), which covers regions that are intensively affected by the removal campaign. We find a negative effect of school removals on primary school and junior high school completion rates. However, we also find positive effects on educational attainment beyond junior high school for those students who began their education in the new merged primary schools. This effect can be attributed to resource pooling and higher teacher quality in the new schools. The adverse effects are more severe for girls, especially if the new schools do not provide boarding and are located far away from student residences, and for children whose parents have low educational attainment, thus exacerbating gender inequality and the intergenerational transmission of education inequality. Our findings provide an important reference for other developing countries that will need to reallocate primary school investment in the future.

Keywords: primary education, school removals, educational attainment, People's Republic of China

JEL Classification: H52, I21, I24, J62

Contents

1. INTRODUCTION

The academic literature and the policy recommendations of international organizations acknowledge the importance of education for economic growth and development (Glewwe 2002; UNESCO 2005; World Bank 2011). Education is a key human capital investment, providing basic knowledge, skills, and competencies to improve the labor productivity and innovative capacity of the population. Primary school education provides the foundational literacy and numeracy for later-life development, and the Millennium Development Goals have thus incorporated universal primary education as a core element. Consequently, developing countries have widely implemented educational investment programs and more specifically school construction initiatives, and studies have verified their positive effects. In her analysis of the effects of a primary school construction program in Indonesia, Duflo (2001) finds that an additional school per 1,000 children led to an increase of between 0.12 and 0.19 years of education. In a study on rural Mozambique, Handa (2002) concludes that raising primary school coverage rates is a cost-effective way of improving primary school enrolment rates. Berlinski, Galiani, and Gertler (2009) find that the construction of pre-primary schools in Argentina improved primary school test score outcomes by 0.23 standard deviations. Burde and Linden (2013) discover that a school construction program in rural Afghanistan increased enrollment by 52 percentage points and test scores by 0.65 standard deviations. Kazianga et al. (2013) conclude that a primary school construction program in Burkina Faso increased enrollment by 19 percentage points and test scores by 0.41 standard deviations. In line with the theoretical predictions, research on the impact of school construction programs on enrollment rates and educational performance has thus found positive effects.

The present study focuses on a consequence of such school construction campaigns and asks the opposite question: what happens when a country that has constructed schools in the past enters a period of demographic transition and decides to remove these schools? In contrast to the literature on school construction programs, research on the effects of school removals, particularly in rural areas, is limited to a number of studies from developed economies that have already faced the challenges of declining birth rates and outmigration from rural areas (see, for example, Kirshner, Gaertner, and Pozzoboni 2010; Bartl 2013). There is, however, no evidence regarding the effects of school removals on the educational attainment of the affected students in developing countries.

In this paper, we draw on data from the People's Republic of China (PRC) to fill this gap in the literature. In particular, we employ individual- and village-level information from the China Household Ethnic Survey (CHES) to analyze the effect of school removals on the educational attainment in Chinese minority regions that school removals have affected intensively since the late 1980s. In our analysis, we distinguish between two types of affected students by analyzing the effects on students who were already enrolled in primary schools when these schools were removed as well as on students who began their primary school education in the larger merged schools after the removal. For both groups, we find negative effects on primary school completion, the transition to junior high school, and junior high school completion rates. However, the latter group, who began their studies in the new schools, experienced positive effects on their transition to senior high school, senior high school completion, and overall educational attainment, whereas these effects are insignificant for the former group. We can explain the positive effects for those students who began their education in the merged schools by resource pooling effects and higher teacher quality in those schools. The negative effects are more pronounced for female students, and

the impact on girls who were directly affected by the removal while in primary school is also reflected in lower senior high school completion rates and lower levels of overall educational attainment, especially if the new schools did not provide boarding and were located far away from the students' residence. We also analyze the sub-sample of students who were still enrolled in primary school at the time of our survey. We find detrimental effects on directly affected female students and positive effects on indirectly affected students, in particular those who could attend boarding schools.

The outline of the rest of this paper is the following. Section II provides historical background information on the Chinese education system and the incidence of school removals over time. Section III introduces our data set. Section IV explains our empirical specification and presents our results. In section V, we discuss these results and conclude the paper.

2. BACKGROUND OF CHINESE SCHOOL REMOVALS AND MERGERS

When the People's Republic of China was established in 1949, 80% of the Chinese population was illiterate and less than 40% of school-aged children were attending school (Hannum and Park 2002). As part of its commitment to building a socialist country, the government initiated large-scale primary and secondary school construction programs across the country, and the following years showed an increase in enrolment rates up to 84.7% in 1965 (Rao and Ye 2016). However, the subsequent years of the Cultural Revolution decimated the educational infrastructure, and education essentially ground to a halt during the first three years, leaving large numbers of Chinese people without access to basic education (Tsang 2000; Fan, Zhang, and Zhang 2004).

After the end of the Cultural Revolution, the PRC re-established and reformed its education system as part of its focus on economic development and modernization. The passing of the *Decision on Educational System Reform* in 1985 and the *Compulsory Education Law of the People's Republic of China* in the following year promoted improvements in the primary and secondary education system. According to the *Compulsory Education Law*, "all children six years of age have the right to schooling regardless of their gender, ethnicity, and race." The two documents laid the foundation for nine-year compulsory education (six years of primary school and three years of junior high school), and the *Decision* further stated that the initial target of the *Compulsory Education Law* in rural areas was universal primary school completion. The government aimed to achieve this through a "one village, one primary school" policy in rural areas, on the basis of which local governments typically regulated that primary schools should be located no further than 2.5 kilometers away from villages (Mei et al. 2015). In line with the envisioned step-by-step implementation of the policy, which allowed for more time in less developed areas of the country, 76% of all counties had achieved universal primary education by 1990, according to the official statistics (He 1996).

However, at about the same time, other trends set in that reduced the necessity of school coverage expansion in rural areas. In particular, birth control policies began to take effect, and the government started to reduce the restrictions on rural–urban migration, which led to reductions in the birth rate and changes in the composition of the Chinese population. At the time of the shift from a one-child "recommendation" to a strict one-child policy, the size of Chinese birth cohorts decreased from 24.6 million in 1973 to about 17.9 million in 1980 (NBS 2016). Moreover, the State Council issued two

crucial documents in 1984 and 1985 that allowed peasants to migrate to towns for work and obtain local temporary residence permits. The number of rural–urban migrants subsequently increased from fewer than 2 million in the early 1980s to more than 20 million in 1984. Within 10 years after the relaxation of the strict division between urban and rural residence status, the number of migrants increased to more than 60 million in 1993 (Duan 1999).

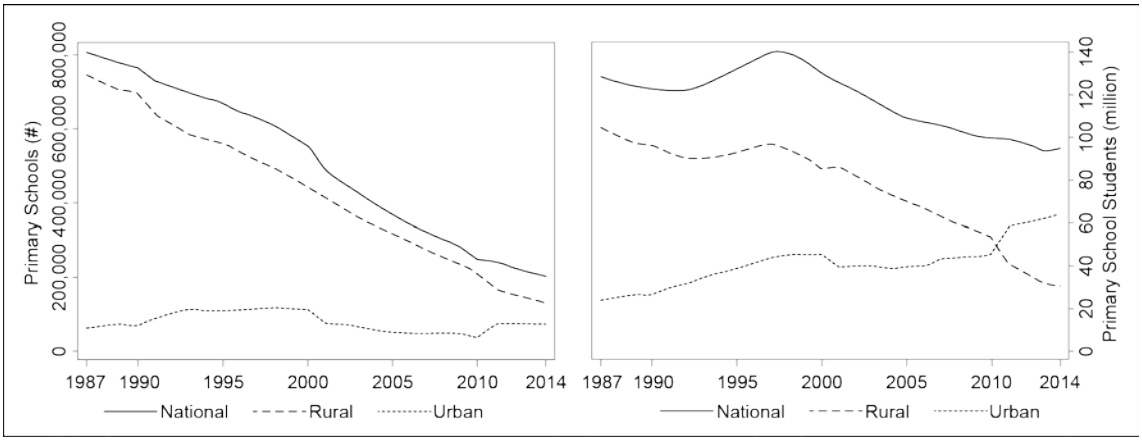
In response to the reductions in birth rates and the number of rural primary school-aged children, policy makers decided to reduce drastically the number of primary schools in rural areas across the country during the second half of the 1980s. As displayed in Figure 1, the number of Chinese primary schools decreased from 807,406 in 1987 to 201,377 in 2014. Over the same time period, the number of rural primary schools decreased from 743,975 to 128,703, while the number of urban schools increased slightly from 63,431 to 72,674. The number of Chinese primary school students dropped from 128.4 million to 94.5 million, and this drop occurred in rural areas (104.6 million to 30.5 million), in sharp contrast to urban areas, where the number of primary school students increased from 23.7 million to 64.0 million. Local governments initiated the school removals in the early years, and they became a national policy in 2001 when the State Council issued the *Decisions on the Reform and Development of Primary Education* (Yang and Wang 2013). The national government's decision explicitly stated the generation of economies of scale and the improvement of school quality as the objectives of the policy. It also mentioned a potential risk of increased dropout rates, which it should be possible to avoid by retaining schools in mountainous terrain and by ensuring that the merged schools were not located too far away from the villages where students were living. However, this goal was hardly attained in practice, with research showing that the average travel distance from students' homes to schools increased from 3.2 to 8.1 kilometers after the school mergers and the average time it took students to walk to school increased from 26 minutes before the school mergers to 44 minutes afterwards (Lei and Xu 2011). Within ten years after the issuance of the *Decisions*, the average school size in township schools had increased by 125.4% compared with an increase of 24.2% in village schools. The class sizes in township schools had increased by 15.7% to 45.6 students per class, hence exceeding the national target limit of 45, while the class sizes in village schools had remained constant at 31 pupils per class (Ministry of Education 2015; also see the analysis in Wu and Shi 2011). The public debate perceived the overall impact of the policy to be negative, and the State Council ultimately abandoned it by issuing the *Suggestions on Adjusting Layout of Rural Compulsory Schools* in 2012 (An 2014; Mei et al. 2015).

With regard to our research question, the potential effect of the school closures and mergers on primary school students across Chinese rural areas is twofold. On the one hand, it raises the costs of attending school due to longer commuting distances and travel times from students' homes to the schools. Increasing the price of schooling through this distance effect leads to a reduction in the demand, ceteris paribus. Previous research indeed identifies school distance as a key factor determining school enrollment (Alderman, Orazem, and Paterno 2001; Glick and Sahn 2006; Huisman and Smits 2009). On the other hand, there is a potential quality upgrading effect due to higher teacher quality and the pooling of resources after school mergers (Zhuo 2006). This school quality effect potentially increases attendance and educational performance (Colclough, Rose, and Tembon 2000).[1] A negative effect due to larger

[1] For example, Mi (2008) explains that 90% of village schools in the Western PRC were unable to provide English lessons due to a lack of teachers and other resources. After the merger campaign, students

class sizes in the new schools may in turn partly offset the positive effect of the resource pooling (Tao and Lu 2011).[2] The overall effect therefore depends on the relative size of these potentially offsetting effects.

Figure 1: Number of Primary Schools and Students, 1987–2014



Source: Ministry of Education of the People's Republic of China (2015).

Being a relatively recent policy, there is little comprehensive research on the overall effects of the school removals on educational attainment, and the existing research on the short-term effects regarding student grades reaches contrasting conclusions. Lu and Du (2010) find a negative short-term effect of school closures on student grade development between 2006 and 2008 in their sample from rural Guangxi Province. In contrast, other research on student exam grades shows that primary school mergers have not harmed student performance (Liu et al. 2010) or even that there is a positive effect on academic performance due to resource pooling (Mo et al. 2012) and that students who transferred to town or county schools performed better than those who finished their primary education in village schools (Chen et al. 2014). The above studies rely on a small number of schools from a single county or a small number of counties, hence providing a less representative picture of the effects of the policy than our household- and village-level data from a large number of villages across seven province-level geographic entities. Moreover, thus far no studies analyze the effects of primary school closures on educational attainment beyond the short-term impact on student grades, and this is the main gap in the literature that we aim to fill.

3. DATA SET

The data set that we employ in this study derives from the China Household Ethnic Survey (CHES) that the Chinese Academy of Social Sciences and the Central University for Nationalities conducted in 2012. Each provincial National Bureau of Statistics administered the survey, and, following a stratified sampling method, researchers selected villages from three Chinese provinces and four autonomous

were generally instructed by English majors who had been trained at teachers' colleges, which brought about noticeable improvements in their command of the English language.

[2] Urquiola (2006) and Jepsen (2015) find a negative relationship between class size and student performance. Rivkin, Hanushek, and Kain (2005) jointly analyze the relative impact of teacher quality and class size reduction and find that the former dominates the latter.

regions that the school removals heavily affected.[3] Importantly, the survey includes both an individual-level questionnaire and a village-level questionnaire, hence enabling us to combine individual-level variables with village-level information.

The village-level questionnaire includes a question about whether the village has a primary school. For those villages that had no primary school at the time of the survey, it additionally asks whether there was a primary school in the past, and, if this is the case, it records the exact year of the removal. There are therefore three types of villages in our data set: (1) villages that have never had a primary school, (2) villages that still had a primary school at the time of the survey, and (3) villages that had a primary school in the past that was removed at some point in time.[4] The third group is our policy group, whereas the first two groups of villages serve as our comparison groups.

We need to pay particular attention to the study period that we can cover in our analysis. Since the Chinese education system in its current form was essentially re-established after the end of the Cultural Revolution, the earliest school entry year that we include in our analysis is 1979. As students generally enter primary school at the age of six, the earliest birth cohort that we can include in our analysis is children born in the year 1973. The most recent birth cohort that we can include in our analysis depends on the particular measure of educational attainment that we analyze. In particular, we only include those birth cohorts that were able to attain the respective level of education by passing smoothly through the education system until the conducting of the survey in 2011. For primary school attainment, the last school entry year that we can include that still permits our respondents to complete primary school by 2011 is 2005, thus making 1999 the most recent birth cohort that we can include in our analysis. In our regressions for junior high school completion, we include the birth cohorts up to 1996, and for our regressions analyzing senior high school completion and educational attainment, we include all the birth cohorts up to 1993. Since senior high school is the highest attainment level that we can analyze, the latest birth cohort included in our overall educational attainment regressions is also 1993. Through this careful selection procedure, we are able to retain those students who terminated their education as well as those who completed each educational level from each cohort in our analysis. The legal school entry years from 1979 until 2005 that our analysis covers thus correspond to the birth cohorts between 1973 and 1999.

Because we know the exact year of the primary school removal in each village as well as the birth year of each respondent to the individual questionnaire, we can infer which school type each village resident could attend when he or she reached primary school entry age.[5] We can then distinguish between two types of affected students. The first group of affected students contains students whose schools were removed while they were enrolled in their local primary school. We refer to these as the directly affected group, because these students experienced a direct disruption in their education at the time of the removal but then potentially benefited from resource pooling in the new schools if they managed to transition to the new schools and continue their education

[3] The province-level entities that we cover are (in alphabetical order): Guangxi Zhuang Autonomous Region, Guizhou Province, Hunan Province, Inner Mongolia Autonomous Region, Ningxia Hui Autonomous Region, Qinghai Province, and Xinjiang Uyghur Autonomous Region.

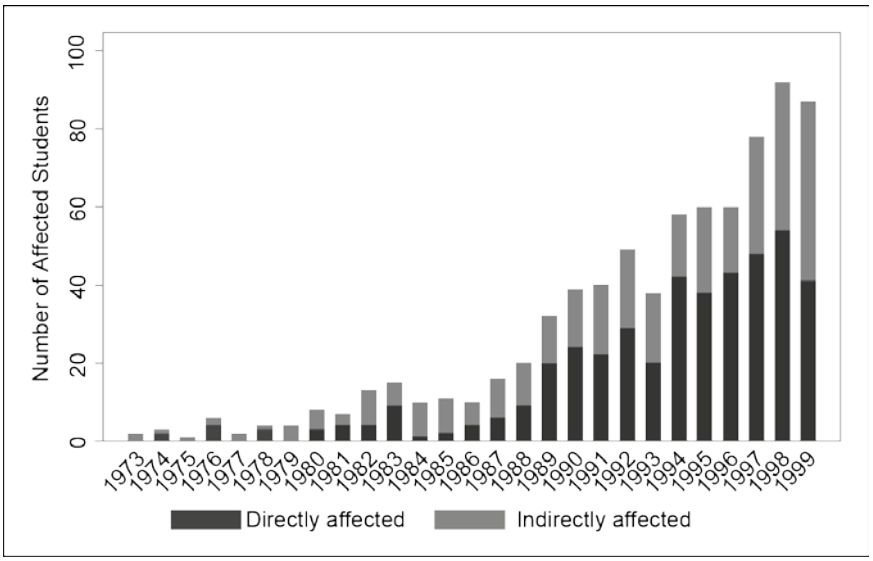
[4] Since the questionnaire does not ask when the primary school was built, we assume that this primary school has existed throughout our study period.

[5] Given the process of rapid Chinese urbanization, it is reasonable to assume that the families who are still residing in these villages today also resided there during the past decades. Liu and Xing's (2016) research points out that outmigration was a side-effect of the school removals, and the affected families are not included in our sample.

smoothly. The second type—which we refer to as the indirectly affected students—is those who entered primary school after the policy came into force in their village. These students began their education in the new merged schools and could therefore benefit from the resource pooling from their first year of primary school education. The remaining students are those who had completed primary school education before the removals and thus remained unaffected by the campaign.

Our final sample consists of 13,803 respondents born between 1973 and 1999. Of these, 9,242 (67.3%) are from a village that has always had its own primary school, while 842 (6.1%) are from a village that has never had a primary school. In total, there are 3,719 respondents residing in a policy village, 2,881 of whom left primary school before the local primary school was removed. The remaining 765 students are from a policy village and were affected by the policy. Among the affected students, 432 students were directly affected while they were enrolled in a primary school that was removed and 333 students were indirectly affected as they entered primary school as residents of a policy village after the school was removed. Figure 2 shows the number of affected students in each birth cohort. Before 1982, fewer than 10 students were affected in each birth year, but this number rose to 32 in 1989 and subsequently continued to increase until the final years of our analysis, in which about 90 students were affected in each birth year.

Figure 2: Number of Students Affected by the Policy in Each Birth Cohort



Note: "Directly affected" refers to those students whose primary school was removed while they were enrolled, while "indirectly affected" refers to those who began their studies in the merged schools after their local school was removed.

Table 1 provides the key descriptive statistics of the individuals and villages in the treatment and control groups. The educational attainment levels and completion rates for primary school, junior high school, and senior high school are slightly higher in the treatment villages. The respondents in the two village types are similar in terms of other demographic characteristics: about 2% of the respondents have urban hukou, about 53% are male, and their average age is between 25 and 26 years. Of the respondents in treatment villages, 54% are from ethnic minorities compared with 67% in control

villages.[6] Similar to the respondents' educational attainment, parental educational attainment is higher in treatment villages, and 12.7% of the village residents have a cadre in their household compared with only 10.9% in the control villages. The control village households are larger, with an average of 5.1 household members compared with 4.6 in treatment villages, but their annual household income is lower than that in control villages (RMB26,614 vs. 28,903).

Table 1: Descriptive Statistics for the Treatment and Control Groups

	Treatment Village	Control Village
Individual and Household Variables		
Finished at least primary school	0.972	0.949
	(0.164)	(0.221)
Progression: primary to junior high	0.788	0.706
	(0.409)	(0.456)
Finished at least junior high school	0.839	0.739
	(0.368)	(0.439)
Progression: junior to senior high	0.298	0.278
	(0.458)	(0.448)
Finished at least senior high school	0.268	0.219
	(0.443)	(0.414)
Educational attainment	3.063	2.879
	(0.731)	(0.816)
Hukou	0.022	0.023
	(0.145)	(0.149)
Male	0.536	0.525
	(0.499)	(0.499)
Age	25.912	25.280
	(7.519)	(7.485)
Minority	0.542	0.674
	(0.498)	(0.469)
CCP cadre in family	0.127	0.109
	(0.333)	(0.312)
Educational attainment (parents)	2.612	2.404
	(0.874)	(0.906)
Household size	4.635	5.103
	(1.343)	(1.705)
Household income	28,902.834	26,613.683
	(31,724.886)	(25,124.982)

continued on next page

[6] The five biggest minority groups in our data set are Miao (14.4%), Hui (9.8%), Uyghur (8.1%), Dong (8.0%), Zhuang (5.6%), and Tibetan (5.1%). Each of the other ethnic minorities constitutes less than 3% of our sample, and their combined share amounts to about 13%.

Table 1 *continued*

	Treatment Village	Control Village
Village-level Variables		
Village population	1,392.033	2,091.154
	(907.070)	(1,423.433)
Distance to nearest primary school	4.870	1.859
	(4.579)	(4.001)
Distance to nearest junior high school	11.623	8.820
	(14.436)	(11.892)
Distance to nearest town	7.368	6.448
	(5.821)	(5.683)
Distance to county-level town	31.475	31.700
	(22.548)	(24.100)
Distance to nearest post/telecom center	7.771	7.365
	(6.309)	(6.606)
Distance to nearest health center	4.589	3.917
	(4.900)	(4.567)
Observations	3,719	10,084

Note: Displayed are the mean values and standard deviations in parentheses.

Our village-level variables show that the control villages are generally larger than the treatment villages in terms of their population. Pupils in treatment villages need to travel approximately 5 kilometers to a primary school and about 12 kilometers to a junior high school, which is a longer distance than in the control villages. The remoteness of the two village types, in terms of their distance to the nearest town (7.8 vs. 7.4 kilometers) and to the nearest county-level town (31.5 vs. 31.7 kilometers), is similar. The two groups of villages are also similar regarding their distance to other facilities, such as a post office (7.5 vs. 7.3 kilometers) and the nearest health station (4.6 vs. 3.9 kilometers). This is important, as the proximity of a health facility could improve childhood health and influence educational outcomes. These descriptive statistics underline the fact that the distance to the nearest primary school is the essential difference between our control and our treatment villages in terms of their remoteness.

4. MODEL SPECIFICATION AND EMPIRICAL RESULTS

4.1 Model Specification

Our empirical approach is to employ a regression methodology that can account for village-level fixed effects, birth cohort fixed effects, and the individual characteristics of the respondents and their family members. The regression model that we use can be summarized as follows:

$$Y_{ij} = \beta_0 + \beta_1 direct_i + \beta_2 indirect_i + \beta_3 X_i + \varphi_j + \sigma_i + \varepsilon_{ij} \quad (1)$$

where Y_{ij} is one of our six measures of educational attainment (primary school completion, transition to junior high school, junior high school completion, transition to senior high school, senior high school completion, and overall educational attainment) for individual *i* from village *j*. The variables $direct_i$ and $indirect_i$ are our policy variables, which equal zero as long as a village had a primary school when student *i* received education and one if the student was either directly or indirectly affected by the removal. X_{ij} is a vector of individual and family characteristics, including the gender and hukou status of the respondent, a dummy for ethnic minority status, a dummy variable equal to one if a family member is a CCP cadre, variables measuring the household size and household income, and a variable measuring the highest level of educational attainment of the respondent's parents.[7] The vector φ_j covers village-level fixed effects for our affected villages, while σ_i captures birth cohort fixed effects and ε_{ij} is the error term of our regression model. For the first five measures of educational attainment, we estimate these models as linear probability models using least squares. The dependent variable in our educational attainment regressions distinguishes between four different outcomes: less than primary, primary school completion, junior high school completion, and senior high school completion or above. We estimate this regression as an ordered logit model.

4.2 Empirical Results for Students of Post-Primary School Age

Table 2 presents our main regression results. We find significant negative effects of the policy on primary school completion, progression to junior high school, and junior high school completion for both directly and indirectly affected students. The school removals have not only reduced primary school graduation rates but are also a factor that can explain why secondary school enrollment rates in the PRC have been low compared with those in other East Asian economies.[8]

Our results for the effects of school removals on post-junior high school education differ between the two treatment groups. We find no significant effects on higher levels of educational attainment for the directly affected students. For the indirectly affected students who began their education in the new merged schools, we find positive effects on their progression to senior high school, senior high school completion rates, and overall educational attainment. This could be due to the positive effects of resource pooling and higher teacher quality in the new primary schools. Those students from the directly affected group who transitioned smoothly to the new schools also benefited from this resource pooling, but there is an offsetting negative effect on their education that is in line with the negative effects of school moves on the performance of already enrolled students (Mehana and Reynolds 2004; Schwartz, Stiefel, and Cordes 2016).

We briefly discuss the coefficients of our control variables. Males and students with an urban hukou outperform other students at all the levels of education analyzed. The coefficient for minority status is negative but insignificant at all the levels of educational attainment.[9] Parental educational attainment, having a family member who is a CCP cadre, and household income all exert positive effects on five of our education variables beyond the primary school level. The effect of household size is largely

[7] We impute parental educational attainment based on hukou, gender, province, and birth cohort for those respondents whose parents are not included in the survey.

[8] In 2002, the PRC's secondary gross enrollment rate amounted to 70% compared with the East Asian average of 91% (World Bank Group 2004; Zhao and Glewwe 2010).

[9] This result is somewhat different to that of Lu et al. (2016), who find that the primary school dropout rates of Muslim minority girls in Qinghai and Ningxia provinces are around 22%–23% compared with the sample average of 8.2% in their study.

insignificant, except for a negative effect after the completion of compulsory education, that is, for progression to senior high school and senior high school completion.

Table 2: Main Regression Results

	(1) PS Compl.	(2) PS to JH	(3) JH Compl.	(4) JH to SH	(5) SH Compl.	(6) Attainment
Treatment (during)	−0.042***	−0.056***	−0.070***	−0.038	−0.033	−0.314
	(0.010)	(0.019)	(0.022)	(0.050)	(0.044)	(0.195)
Treatment (after)	−0.065***	−0.075*	−0.093**	0.252**	0.221***	0.654**
	(0.015)	(0.042)	(0.042)	(0.096)	(0.079)	(0.290)
Urban hukou	0.035**	0.151***	0.170***	0.408***	0.457***	3.075***
	(0.015)	(0.021)	(0.026)	(0.041)	(0.038)	(0.368)
Male	0.047***	0.081***	0.098***	0.018*	0.041***	0.695***
	(0.011)	(0.009)	(0.011)	(0.011)	(0.008)	(0.075)
Minority	−0.014	−0.029	−0.033	−0.003	−0.009	−0.175
	(0.009)	(0.018)	(0.020)	(0.026)	(0.019)	(0.130)
Educational attainment (parents)	0.003	0.024***	0.028***	0.071***	0.064***	0.366***
	(0.003)	(0.005)	(0.005)	(0.009)	(0.007)	(0.040)
Household size	0.001	0.002	0.001	−0.010*	−0.008*	−0.027
	(0.002)	(0.003)	(0.003)	(0.006)	(0.004)	(0.022)
CCP cadre in family	−0.001	0.031**	0.026**	0.107***	0.088***	0.442***
	(0.007)	(0.012)	(0.013)	(0.025)	(0.020)	(0.115)
HH income decile	0.001	0.008***	0.008***	0.008**	0.008***	0.068***
	(0.001)	(0.002)	(0.002)	(0.003)	(0.002)	(0.014)
Observations	13791	11811	12408	8141	10848	10848
*R*2	0.225	0.346	0.391	0.352	0.352	0.263

Notes: Standard errors are clustered at the county level and displayed in parentheses. The significance symbols denote * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$. The "R^2" for educational attainment is the pseudo R^2 from the ordered logit regression.

As discussed in the literature, the enrollment rates for boys are higher than those for girls in rural areas of the PRC (Connelly and Zheng, 2003; Song, Appleton, and Knight 2006), and the enrollment decision for females is more price elastic than that for boys (Brown and Park 2002; Chyi and Zhou 2014). Considering that this is the result of parental preferences and cost–benefit analysis of the costs and returns to education, it is therefore likely that the policy that we are investigating also affects each gender differently. In Table 3, we therefore present more detailed findings by gender and school characteristics. We again distinguish between the results for the directly affected students, presented in the upper panel, and the results for the indirectly affected students, presented in the lower panel. In this table, we also present the findings for different school types (boarding vs. non-boarding), the effect of distance to the new school, the differences between Han Chinese and ethnic minorities, and the role that parental education plays in the impact of the school removals. For each of these groups, we first discuss the results for those students who had already entered primary school at the time of the school removal; that is, the table shows the directly affected students in the upper panel and then the lower panel describes the results for indirectly affected students.

Table 3: Regression Results by Gender: School Characteristics, Ethnicity, and Intergenerational Transmission of Education

	Male Sample					
	(1)	(2)	(3)	(4)	(5)	(6)
	PS Compl.	PS to JH	JH Compl.	JH to SH	SH Compl.	Attainment
Directly Affected: Individuals in Primary School at the Time of the School Removal						
Treatment	–0.013	–0.046**	–0.044**	–0.020	0.001	–0.058
	–0.008	–0.019	–0.021	–0.066	–0.059	–0.263
Treatment (boarding)	–0.021*	0.022	0.018	–0.006	0.022	0.015
	–0.012	–0.033	–0.036	–0.111	–0.107	–0.497
Treatment (non-boarding)	–0.010	–0.078**	–0.071*	–0.044	–0.024	–0.152
	–0.012	–0.035	–0.036	–0.089	–0.078	–0.352
Treatment (short distance)	–0.015**	–0.033	–0.040	0.087	0.079	0.196
	–0.007	–0.055	–0.057	–0.105	–0.082	–0.337
Treatment (long distance)	–0.007	–0.110***	–0.090**	–0.111	–0.083	–0.349
	–0.018	–0.032	–0.038	–0.132	–0.118	–0.575
Treatment (Han Chinese)	–0.003	–0.018	–0.016	–0.088	–0.056	–0.255
	–0.008	–0.022	–0.025	–0.099	–0.092	–0.510
Treatment (minorities)	–0.016	–0.052*	–0.044	0.036	0.041	0.154
	–0.013	–0.028	–0.032	–0.090	–0.082	–0.408
Treatment (high par. educ.)	0.001	–0.071	–0.035*	0.113	0.097	0.504
	–0.007	–0.047	–0.021	–0.086	–0.080	–0.389
Treatment (low par. educ.)	–0.032	–0.094	–0.096	–0.196	–0.197*	–0.915*
	–0.021	–0.076	–0.058	–0.134	–0.113	–0.526
Indirectly Affected: Individuals Who Entered Primary School After the School Removal						
Treatment	–0.026***	–0.030	–0.042	0.343***	0.300***	1.226**
	–0.009	–0.033	–0.033	–0.118	–0.109	–0.501
Treatment (boarding)	–0.041***	0.011	–0.007	0.381**	0.291*	1.195
	–0.012	–0.059	–0.061	–0.163	–0.157	–0.842
Treatment (non-boarding)	–0.024**	–0.055	–0.069	0.317**	0.277**	1.171**
	–0.011	–0.054	–0.055	–0.144	–0.122	–0.513
Treatment (short distance)	–0.028***	–0.151	–0.173*	0.462***	0.389***	1.129**
	–0.009	–0.093	–0.093	–0.126	–0.091	–0.472
Treatment (long distance)	–0.030***	–0.184	–0.205*	0.672***	0.546***	1.486
	–0.010	–0.119	–0.119	–0.086	–0.093	–0.938
Treatment (Han Chinese)	–0.012	0.002	–0.006	0.457**	0.482***	17.771***
	–0.011	–0.034	–0.038	–0.191	–0.160	–1.078
Treatment (minorities)	–0.033***	–0.038	–0.047	0.304***	0.235***	0.701**
	–0.010	–0.052	–0.052	–0.104	–0.077	–0.308
Treatment (high par. educ.)	–0.003	0.013	–0.006	0.423***	0.469***	2.495***
	–0.011	–0.072	–0.051	–0.125	–0.121	–0.816
Treatment (low par. educ.)	–0.047***	0.055	–0.017	–0.070	–0.017	0.033
	–0.016	–0.093	–0.082	–0.170	–0.101	–0.503

continued on next page

Table 3 *continued*

	Female Sample					
	(7)	(8)	(9)	(10)	(11)	(12)
	PS Compl.	PS to JH	JH Compl.	JH to SH	SH Compl.	Attainment
Directly Affected: Individuals in Primary School at the Time of the School Removal						
Treatment	–0.077***	–0.075**	–0.102**	–0.100*	–0.115**	–0.863***
	–0.019	–0.036	–0.040	–0.056	–0.053	–0.277
Treatment (boarding)	–0.092***	–0.032	–0.069	–0.053	–0.070	–0.713
	–0.033	–0.049	–0.047	–0.111	–0.088	–0.534
Treatment (non-boarding)	–0.088***	–0.123**	–0.142**	–0.147**	–0.165**	–1.035***
	–0.021	–0.060	–0.062	–0.066	–0.064	–0.382
Treatment (short distance)	–0.103***	0.021	–0.015	0.056	0.076	0.304
	–0.026	–0.104	–0.107	–0.061	–0.061	–0.552
Treatment (long distance)	–0.060**	–0.185***	–0.201***	–0.179**	–0.217***	–1.403***
	–0.027	–0.063	–0.064	–0.069	–0.064	–0.394
Treatment (Han Chinese)	–0.046**	–0.043	–0.073	–0.190**	–0.203**	–1.331**
	–0.019	–0.047	–0.051	–0.084	–0.090	–0.541
Treatment (minorities)	–0.074***	–0.060	–0.081	–0.061	–0.094	–0.633
	–0.026	–0.058	–0.056	–0.092	–0.084	–0.410
Treatment (high par. educ.)	–0.026*	–0.101	–0.060	–0.027	–0.130	–1.133**
	–0.013	–0.068	–0.052	–0.089	–0.087	–0.521
Treatment (low par. educ.)	–0.108***	–0.091	–0.123	–0.084	–0.123*	–1.152*
	–0.038	–0.098	–0.083	–0.087	–0.070	–0.620
Indirectly Affected: Individuals Who Entered Primary School After the School Removal						
Treatment	–0.113***	–0.126	–0.141*	0.256**	0.220***	0.624*
	–0.029	–0.077	–0.073	–0.099	–0.074	–0.343
Treatment (boarding)	–0.076**	0.033	0.039	0.356***	0.271***	1.269*
	–0.035	–0.190	–0.168	–0.077	–0.057	–0.650
Treatment (non-boarding)	–0.116***	–0.203***	–0.225***	0.173	0.163	0.135
	–0.033	–0.069	–0.074	–0.124	–0.110	–0.512
Treatment (short distance)	–0.138***	–0.139	–0.178*	0.434***	0.440***	1.525
	–0.034	–0.093	–0.096	–0.108	–0.100	–0.931
Treatment (long distance)	–0.138***	–0.150	–0.188*	0.449***	0.446***	1.432
	–0.033	–0.109	–0.110	–0.119	–0.112	–1.221
Treatment (Han Chinese)	–0.073**	–0.127	–0.163	0.331***	0.196**	0.219
	–0.033	–0.091	–0.102	–0.063	–0.077	–0.382
Treatment (minorities)	–0.103**	–0.020	–0.007	0.224	0.202*	0.824
	–0.041	–0.071	–0.072	–0.165	–0.120	–0.615
Treatment (high par. educ.)	–0.046	–0.081	–0.115	0.475***	0.342***	1.305**
	–0.036	–0.128	–0.092	–0.125	–0.119	–0.592
Treatment (low par. educ.)	–0.201***	–0.032	–0.015	0.339*	0.412***	1.775*
	–0.039	–0.146	–0.137	–0.193	–0.133	–1.030

Notes: Standard errors are clustered at the county level and shown in parentheses. Significance symbols are: * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$. PS denotes primary school, JH denotes junior high school, and SH refers to senior high school, and the attainment variable consists of four levels of educational attainment, the first of which is below primary and the other three are the ones mentioned above.

We generally find that the negative effects of the policy are more pronounced for girls than for boys. For directly affected female students, we find a significant negative impact on all of our six measures for educational outcomes. The coefficients in our male sample are smaller and only significant for progression to junior high school and junior high school completion. Among the indirectly affected students, boys also fare better on all the measures examined. We find negative indirect effects on primary school completion rates for both genders and negative effects for girls in our regression for junior high school completion. In line with our findings in Table 2, we find positive indirect effects of school removals for both genders beyond the junior high school level. The fact that parents favor sons over daughters and are willing to continue to invest in their education irrespective of their grades and in spite of the increased costs due to the school removal can explain the gender differences. Another reason for the higher dropout rates for girls is the lower return to educational investments for females, because waged employment opportunities in rural areas of the PRC are limited and largely confined to males.

Moving on to the results for the first of the four moderator variables analyzed, we find that the negative effects of the removals are much more pronounced if the new school did not provide boarding. The parents of directly affected boys and girls opted not to let their children transfer to the new primary schools if the new school was a boarding school, and the primary school completion rates were thus negatively affected. For the case of boarding schools, we find no negative effects beyond primary completion. For non-boarding schools, we find negative effects for directly affected girls on all six education variables analyzed. This points to a second reason behind the gender differences, which is that travelling to school entails more difficulties for girls than for boys due to physical differences and safety concerns. While the effects of moving to a boarding school discussed above are similar for boys and girls, there are severe detrimental effects on girls if the new school did not provide boarding, influencing all the levels of educational attainment analyzed, while the detrimental effects on boys are much smaller and insignificant beyond the compulsory education level. Indirectly affected boys and girls both reaped benefits from the school removal at the post-junior high school level if the new school provided boarding. Indirectly affected male students from non-boarding schools also exhibit these positive effects, but girls at non-boarding schools were negatively affected until junior high school completion and did not earn benefits for the three measures after junior high school completion.

The travel distance to a school that does not offer boarding opportunities is a crucial factor behind the boarding vs. non-boarding differences. To analyze this variable, we split the new merged schools into two groups depending on whether their distance to the village where the respondents reside was larger or smaller than the median distance (about 3 kilometers) in our sample. We find minor detrimental effects in our short-distance sample but large negative effects that resemble the non-boarding school results for our long-distance sample. School removals in combination with a long travel distance to new schools without boarding opportunities bear significant negative effects for all of our education variables for females, while the effects of moving to a non-boarding school that is located close to student residences are essentially similar to the effects of moving to a boarding school for both genders.

We also compare the effect of the treatment coefficient between Han Chinese and ethnic minorities (displayed in rows 9 and 11, respectively). The results from this part of our analysis reveal striking differences between ethnic groups. The coefficients in our male samples are insignificant for both ethnic groups, but the negative effects in the female sample are larger for Han females than for those from ethnic minorities. The analysis largely confirms the negative effects in the female sub-samples for Han

Chinese but not for ethnic minorities, for which we find no negative effects beyond primary school completion. The gender differences for directly affected students therefore mainly apply to Han Chinese. For indirectly affected students, the differences between ethnic groups are smaller, and we find negative effects only for the case of primary school completion. For later-stage education variables, we find positive effects for both genders between Han and minorities, reflecting the fact that those students who began their education in the new school and could persist until primary completion largely gained later on from the removals.

The final aspect that we analyze in this subsection is the removal policy's impact on the intergenerational mobility of education in the Chinese rural population. There are general concerns about low intergenerational mobility of education in the PRC (Golley and Kong 2013; Magnani and Zhu 2015) and the role that this plays in Chinese inequality more generally (Gong, Leigh, and Meng 2012; Yuan and Lin 2013). To conduct this analysis, we split our sample into those whose parents have attained primary education or less (henceforth the "low parental education" group) and those whose parents have completed at least junior high school education (the "high parental education" group) and determine how the effect of the school removals differs between these two groups. Overall, we find evidence that the policy has reinforced the intergenerational immobility in educational attainment, as the adverse effects of the policy are more pronounced for the low parental education group. Regarding the direct impact of the policy on people whose parents are from the low education group, we find a negative effect on female primary completion rates as well as on senior high school completion and overall attainment for both boys and girls. The coefficients for our high education group are smaller and insignificant except for male junior high school completion, female primary, and female educational attainment. For the indirectly affected individuals, we find a significant negative impact on primary school completion for both genders in the low education group. On the contrary, we find no negative impact on indirectly affected students whose parents are highly educated but positive effects on all three measures, including education past the compulsory stage. For these three measures, females of both parent groups benefited from the policy.

Overall, this part of our analysis shows that the school closures and mergers triggered a negative impact on educational attainment at the primary and junior high school levels for both boys and girls and for both directly and indirectly affected students. For directly affected students, there is no impact on boys beyond the junior high school level, but there are significant negative effects on girls at all levels of education. Indirectly affected boys and girls, that is, those who entered primary school after the removal, benefit from the resource pooling and are more likely to transfer to senior high school, complete senior high school, and reach higher overall educational attainment. The gender differences and negative effects on females due to primary school removals identified in our study corroborate the findings of Li and Liu (2014), who find a positive impact of improved school availability on girls but not on boys. The major moderators of the impact on females are the lack of boarding opportunities in combination with long travel distance to the new schools. The intergenerational immobility of educational attainment intensified due to school removals, as the negative effects on directly affected students are larger and the positive effects on indirectly affected students are less widespread among people whose parents had low educational attainment.

4.3 Empirical Results for Students Enrolled in Primary School

In addition to analyzing the educational outcomes of students of post-primary age, we are able to analyze the 2,370 students in our data set who were enrolled in a primary school at the time of the survey in 2011. The outcome variable that we can analyze for this group is whether they have experienced a delay in their education and were still enrolled in a primary school despite being of secondary school age. Our dependent variable is therefore a dummy variable that is equal to 1 if a student is enrolled in primary school and of primary school age and equal to 0 if the student is 12 years or older but still enrolled in primary school.

Table 4: Regression Results for Students Enrolled in Primary School

	(1) Male	(2) Female
Directly Affected: Individuals Who were in Primary School at the Time of School Removal		
Treatment	0.017	−0.207***
	(0.051)	(0.056)
Treatment (boarding)	0.179*	−0.163
	(0.087)	(0.194)
Treatment (no boarding)	−0.016	−0.173
	(0.097)	(0.098)
Treatment (Han)	−0.120	−0.223
	(0.103)	(0.115)
Treatment (minority)	0.121**	−0.217**
	(0.048)	(0.087)
Treatment (high par. educ.)	0.078*	−0.188
	(0.033)	(0.111)
Treatment (low par. educ.)	−0.071	−0.239*
	(0.163)	(0.122)
Indirectly Affected: Individuals Who Entered Primary School After the School Removal		
Treatment	0.114**	0.101**
	(0.040)	(0.041)
Treatment (boarding)	0.185**	0.226***
	(0.069)	(0.047)
Treatment (no boarding)	0.115	0.031
	(0.060)	(0.060)
Treatment (Han)	0.121	0.068
	(0.075)	(0.085)
Treatment (minority)	0.143*	0.118**
	(0.072)	(0.037)
Treatment (high par. educ.)	0.096*	0.097*
	(0.047)	(0.040)
Treatment (low par. educ.)	0.191	0.149*
	(0.165)	(0.068)

Notes: Standard errors are clustered at the province level and displayed in parentheses. The significance symbols denote * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

We again estimate equation 1 for different sub-samples, as presented in Table 3, and then report our estimation results in Table 4.[10] For the students who were already enrolled in primary school at the time of the removal, we find negative effects for girls, especially those from ethnic minority groups and those whose parental educational attainment levels were low. We find some positive effects for boys who transferred to boarding schools and those from ethnic minorities. On the contrary, the positive impact of the school removals on children who began their education in the new schools is again widespread across various sub-samples. We find a positive impact on boys and girls, in particular for those who studied at boarding schools, those from ethnic minority groups, and those whose parents had high educational attainment. Similar to the results for students at post-primary school age, with regard to currently enrolled students, the policy had a detrimental impact on girls who were directly affected by a school removal and generally had a positive impact on boys and girls who were only indirectly affected and began their education in the new merged schools.

5. CONCLUSIONS

There is a well-established literature pointing out the positive effects of school construction campaigns on economic growth and development. In this paper, we focus on the opposite process by analyzing the effect on educational attainment when a country that has engaged in large-scale primary school construction in the past removes these schools as a response to its demographic transition. Due to rapidly decreasing birth rates and a declining number of primary-school-aged children, the PRC has drastically reduced the number of primary schools across the country since the 1980s. To analyze our research question, we construct a data set derived from the China Household Ethnic Survey (CHES), which contains individual- and village-level information and thus enables us to study the effects of these school removals on the educational attainment of local residents.

In our analysis, we distinguish between two types of affected students by analyzing the effects on those students who experienced direct disruptions to their educational progression because their primary school was removed at the time of their enrolment and those who began primary school education after their local school was removed and who were therefore only indirectly affected. The costs of attending school, through a longer travel time or boarding, increased for both of these groups, but the latter group began their education in the larger merged schools and thus did not experience direct disruptions during their study.

For the students who experienced direct disruptions, we find that school removals exerted a negative effect on primary school and junior high school completion rates, implying a higher likelihood of students discontinuing their education after their local school was removed. Moreover, these adverse effects are more severe for girls, especially if the new schools did not provide boarding and were located far away from students' homes. An increase in the costs of attending school, which has raised dropout rates, as well as the higher price elasticity of education for girls can explain these results, in line with previous research on the PRC.

[10] To retain sufficient degrees of freedom across our subsamples, we include county-level fixed effects and cluster standard errors at the province level to obtain a sufficient number of observations in each cluster.

For those students who could begin their studies in the merged primary schools, we also find adverse effects on educational attainment up to junior high school completion. However, we then find positive effects on educational attainment beyond junior high school. We can attribute this positive long-term effect to resource pooling and improved teaching quality in the new schools, which raised the quality of education. Those students who could sustain the inconveniences of travelling to the new schools and continued their education subsequently reaped benefits in terms of higher transition rates to senior high school, higher senior high school completion rates, and overall educational attainment.

In addition to boarding opportunities at the new schools and the travel distance from students' homes to the schools in the case of non-boarding schools, parent education is an important moderating factor in our analysis. The negative effects on directly affected students are more severe, and the positive effects on indirectly affected students are less widespread for those whose parents only attained primary school completion or less.

We conduct further analysis of the effects of school removals using the subsample of students who were enrolled in primary school at the time of the implementation of the CHES. The outcome variable that we analyze for this subsample is whether the students are within the correct age group for primary school attendance or whether they have experienced a delay in their study and are therefore already post-primary school age. This part of our analysis confirms the detrimental effects of the policy on female students who were enrolled at the time of the school removal. It also confirms a positive impact on those students who began their study in the new schools for both boys and girls, in particular for those who attended a boarding school.

Due to the differences between the directly and the indirectly affected student subgroups, potential policy advice based on our analysis is to let students start primary education in the new school if it is foreseeable at the start of their education that the nearest primary school will be removed and merged with another school. Our results also point out that the school removals analyzed in our study exacerbated the gender inequality in Chinese education but have potentially helped in reducing the rural–urban educational gap for those students who benefited from the higher education quality in the larger merged schools in rural areas.

REFERENCES

Alderman, H., P. F. Orazem, and E. M. Paterno. 2001. “School Quality, School Cost, and the Public/Private School Choices of Low-Income Households in Pakistan.” *Journal of Human Resources* 36: 304–26.

An, X. 2014. “The Way Out for the ‘School Consolidation Policy’: A Comparative Study Based on the American School Merger Experience.” *Journal of Xingtai University* 29: 173–6.

Bartl, W. 2013. “Economisation of the Education System in Shrinking Regions? The Demographic Responsiveness of Education Demand and Supply at Different Levels of the Education System.” *Comparative Population Studies,* 39: 409–448.

Berlinski, S., S. Galiani, and P. Gertler. 2009. “The Effect of Pre-primary Education on Primary School Performance.” *Journal of Public Economics*, 93: 219–34.

Brown, P. H., and A. Park. 2002. “Education and Poverty in Rural China.” *Economics of Education Review* 21: 523–41.

Burde, D., and L. L. Linden. 2013. “Bringing Education to Afghan Girls: A Randomized Controlled Trial of Village-Based Schools.” *American Economic Journal: Applied Economics* 5, 27–40.

Chen, X., H. Yi, L. Zhang, D. Mo, J. Chu, and S. Rozelle. 2014. “Do Poor Students Benefit from China’s Merger Program? Transfer Path and Educational Performance.” *Asia Pacific Journal of Education* 34: 15–35.

Chyi, H., and B. Zhou. 2014. “The Effects of Tuition Reforms on School Enrollment in Rural China.” *Economics of Education Review* 38: 104–23.

Colclough, C., P. Rose, and M. Tembon. 2000. “Gender Inequalities in Primary Schooling: The Roles of Poverty and Adverse Cultural Practice 1.” *International Journal of Educational Development* 20: 5–27.

Connelly, R., and Z. Zheng. 2003. “Determinants of School Enrollment and Completion of 10 to 18 Year Olds in China.” *Economics of Education Review* 22: 379–88.

Duan, C. R. 1999. “The Effect of the Floating Population on Urban and Rural Socioeconomic Development” (in Chinese). *Population Research* 22: 58–63.

Duflo, E. 2001. “Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment.” *American Economic Review* 91: 795–813.

Fan, S., L. Zhang, and X. Zhang. 2004. “Reforms, Investment, and Poverty in Rural China.” *Economic Development and Cultural Change* 52: 395–421.

Glewwe, P. 2002. “Schools and Skills in Developing Countries: Education Policies and Socioeconomic Outcomes.” *Journal of Economic Literature* 40: 436–82.

Glick, P., and D. E. Sahn. 2006. “The Demand for Primary Schooling in Madagascar: Price, Quality, and the Choice between Public and Private Providers.” *Journal of Development Economics* 79: 118–45.

Golley, J., and S. T. Kong. 2013. “Inequality in Intergenerational Mobility of Education in China.” *China World Economy* 21: 15–37.

Gong, H., A. Leigh, and X. Meng. 2012. “Intergenerational Income Mobility in Urban China.” *Review of Income and Wealth* 58: 481–503.

Handa, S., 2002. “Raising Primary School Enrolment in Developing Countries: The Relative Importance of Supply and Demand.” *Journal of Development Economics* 69: 103–28.

Hannum, E., and A. Park. 2002. “Educating China’s Rural Children in the 21st Century.” *Harvard China Review*, 3, 8–14.

He, D. 1996. *Education in Contemporary China*. Beijing: Contemporary China Press.

Huisman, J., and J. Smits. 2009. “Effects of Household- and District-Level Factors on Primary School Enrollment in 30 Developing Countries.” *World Development* 37: 179–93.

Jepsen, C., 2015. “Class Size: Does it Matter for Student Achievement?” *IZA World of Labor* 190: 1–10.

Kazianga, H., D. Levy, L. L. Linden, and M. Sloan. 2013. “The Effects of ‘Girl-Friendly’ Schools: Evidence from the BRIGHT School Construction Program in Burkina Faso.” *American Economic Journal: Applied Economics* 5: 41–62.

Kirshner, B., M. Gaertner, and K. Pozzoboni. 2010. “Tracing Transitions: The Effect of High School Closure on Displaced Students.” *Educational Evaluation and Policy Analysis* 32: 407–429.

Lei, W. P., and L. Xu. 2011. “Government Responsibility for Rural School Bus Development—Compulsory Education Layout Adjustment as Background” (in Chinese). *Journal of the Chinese Society of Education* 1: 16–9.

Li, L., and H. Liu. 2014. “Primary School Availability and Middle School Education in Rural China.” *Labour Economics* 28: 24–40.

Liu, C., L. Zhang, R. Luo, S. Rozelle, and P. Loyalka. 2010. “The Effect of Primary School Mergers on Academic Performance of Students in Rural China.” *International Journal of Educational Development* 30: 570–85.

Liu, J., and C. Xing. 2016. “Migrate for Education: An Unintended Effect of School District Combination in Rural China.” *China Economic Review* 40: 192–206.

Lu, K., and Y.-H. Du. 2010. “The Effect of Layout Adjustment of Rural Schools on Student Achievement.” *Tsinghua Journal of Education* 31: 64–73.

Lu, M., M. Cui, Y. Shi, F. Chang, D. Mo, S. Rozelle, and N. Johnson. 2016. “Who Drops Out from Primary Schools in China? Evidence from Minority-Concentrated Rural Areas.” *Asia Pacific Education Review* 17: 235–52.

Magnani, E., and R. Zhu. 2015. “Social Mobility and Inequality in Urban China: Understanding the Role of Intergenerational Transmission of Education.” *Applied Economics* 47: 4590–606.

Mehana, M., and A. J. Reynolds. 2004. “School Mobility and Achievement: A Meta-analysis.” *Children and Youth Services Review* 26: 93–119.

Mei, H., Q. Jiang, Y. Xiang, and X. Song. 2015. “School Consolidation: Whither China’s Rural Education?” *Asian Social Work and Policy Review* 9: 138–50.

Mi, H. 2008. “Rural Elementary School Merging is Conducive to English Language Education.” *Neijiang Technology* 35: 156.

Ministry of Education of the People’s Republic of China. 2015. *Educational Statistics Yearbook of China*. Beijing: People’s Education Press.

Mo, D., H. Yi, L. Zhang, Y. Shi, S. Rozelle, and A. Medina. 2012. “Transfer Paths and Academic Performance: The Primary School Merger Program in China.” *International Journal of Educational Development* 32: 423–31.

National Bureau of Statistics of the People’s Republic of China (NBS). 2016. *China Statistical Yearbook*. Beijing: China Statistics Press.

Rao, J., and J. Ye. 2016. “From a Virtuous Cycle of Rural–Urban Education to Urban-Oriented Rural Basic Education in China: An Explanation of the Failure of China’s Rural School Mapping Adjustment Policy.” *Journal of Rural Studies* 47: 601–11.

Rivkin, S. G., E. A. Hanushek, and J. F. Kain. 2005. “Teachers, Schools, and Academic Achievement.” *Econometrica* 73: 417–58.

Schwartz, A. E., L. Stiefel, and S. A. Cordes. 2016. “Moving Matters: The Causal Effect of Moving Schools on Student Performance.” *Education Finance and Policy* 12: 419–446.

Song, L., S. Appleton, and J. Knight. 2006. “Why Do Girls in Rural China Have Lower School Enrollment?” *World Development* 34: 1639–53.

Tao, Q., and J. Lu. 2011. “Rural Small Class Teaching: The Effective Way To Promote the Balanced Development of the Urban and Rural Education.” *Theory and Practice of Education* 34: 24–6.

Tsang, M. C. 2000. “Education and National Development in China since 1949: Oscillating Policies and Enduring Dilemmas.” *China Review*: 579–618.

United Nations Educational, Scientific and Cultural Organization (UNESCO). 2015. *Education for All 2000–2015: Achievements and Challenges*. Paris: UNESCO Publishing.

Urquiola, M., 2006. “Identifying Class Size Effects in Developing Countries: Evidence from Rural Bolivia.” *Review of Economics and Statistics* 88: 171–7.

World Bank Group. 2004. *World Development Report 2004: Making Services Work for Poor People*. Washington, DC: The World Bank Group.

———. 2011. *Learning for All: Investing in People’s Knowledge and Skills to Promote Development*. Washington, DC: The World Bank Group.

Wu, Z., and N. Shi. 2011. “The Trends and Policy Issues for Rural School Layout and Adjustment in the Last Decade in China.” *Educational Research* 378: 22–30.

Yang, D.-P., and S. Wang. 2013. “From Extending Teaching to Remote Areas and Running School in Various Forms to Canceling Teaching Centers and Merging Schools.” *Tsinghua Journal of Education* 34: 25–34.

Yuan, Z., and C. Lin. 2013. “The Trend and Mechanism of Intergenerational Income Mobility in China: An Analysis from the Perspective of Human Capital, Social Capital and Wealth.” *World Economy* 36: 880–98.

Zhao, M., and P. Glewwe. 2010. “What Determines Basic School Attainment in Developing Countries? Evidence from Rural China.” *Economics of Education Review* 29: 451–60.

Zhuo, M., 2006. *Primary School Consolidation in Rural China: Advantages, Disadvantages and Solutions*. Fuzhou: Education Forum, the Education Department of Fujian Province.