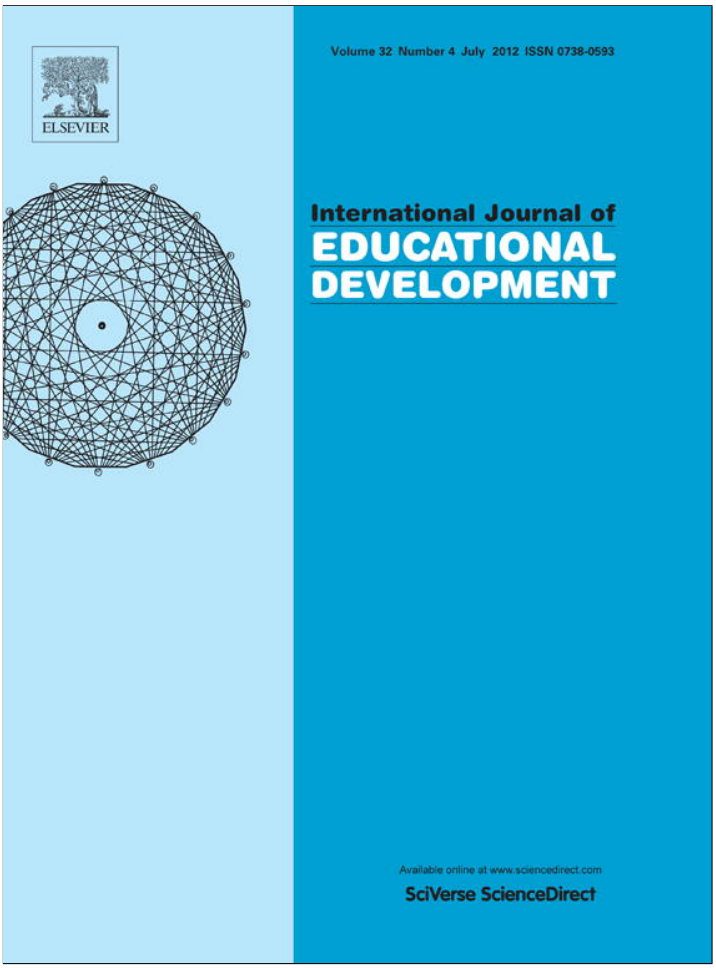

International Journal of Educational Development 32 (2012) 555–563

Contents lists available at SciVerse ScienceDirect

International Journal of Educational Development

journal homepage: www.elsevier.com/locate/ijedudev

Dropping out: Why are students leaving junior high in China's poor rural areas?

Hongmei Yi [a,*], Linxiu Zhang [a], Renfu Luo [a], Yaojiang Shi [b], Di Mo [c], Xinxin Chen [d], Carl Brinton [e], Scott Rozelle [e]

[a] Center for Chinese Agricultural Policy, Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences, China
[b] Northwest Socio-economic Development Research Center (NSDRC), Northwest University, Xi'an, China
[c] LICOS Centre for Institutions and Economic Performance, University of Leuven (KUL), Belgium
[d] College of Economics, Zhejiang Gongshang University, China
[e] Stanford University, United States

ARTICLE INFO

Keywords:
Dropout
Rural China
Poverty
Academic performance
Opportunity cost

ABSTRACT

Despite requirements of and support for universal education up to grade 9, there are concerning reports that poor rural areas in China suffer from high and maybe even rising dropout rates. Although aggregated statistics from the Ministry of Education show almost universal compliance with the 9-year compulsory education law, there have been few independent, survey-based studies regarding dropout rates in China. Between 2009 and 2010 we surveyed over 7800 grade 7, 8, and 9 students from 46 randomly selected junior high schools in four counties in two provinces in North and Northwest China to measure the dropout rate. We also used the survey data to examine factors correlated with dropping out, such as the opportunity cost of going to school, household poverty, and poor academic performance. According to the study's findings, drop out rates between grade 7 and grade 8 reached 5.7% and dropout rates between grade 8 and grade 9 reached 9.0%. In sum, among the total number of students attending junior high school during the first month of the first term of grade 7, 14.2% had left school by the first month of grade 9. Dropout rates were even higher for students that were older, from poorer families (and families in which the parents were not healthy), or were performing more poorly academically. We conclude that although the government's policy of reducing tuition and fees for junior high students may be necessary, it is not sufficient to solve the dropout problem.

1. Introduction

Yanyan dropped out of junior high school to work for her cousin picking red dates for 250 yuan a month (about US$35). She rents half of a room for 60 yuan where she lives with her brother. After paying for rent and food, she sends the remaining money (about 100 yuan) to her father for medicine to treat his back injury and to her mother for medicine for her chronic headaches. Her parents, despite their conditions, continue to farm in their village 3 h away. Yanyan's dream is to become a hair stylist like her older sister.

Xiao Zhang is in the top 15 in her class even though her mother never finished elementary school. She says that she will not drop out of school because she likes to study and wants to go to college in the future so that she can work with computers in a big city when she grows up.

Haibin is working in Wenling, a county near Wenzhou that is over 2000 km away from his hometown. Although he was unavailable to interview, his classmates said that he was never good at school and had already been held back twice. His father, Old Zhang, explained that Haibin had been contacted by a labor contractor outside of his junior high boarding school one afternoon. He was offered more money than Old Zhang had made in the previous 3 years. Old Zhang said that he was worried that his son was dropping out of school. However, he had not objected when his son insisted that he was "old enough."

How many students are dropping out of school like Yanyan and Haibin? Is this common? Or is this just a rare occurrence? What makes these three students—Yanyan, Xiao Zhang and Haibin—different? What factors influence one to stay in school and the other two to drop out? More generally, what determines whether these junior high students and the millions like them in poor rural areas of China will drop out or stay in school?

The overall goal of this paper is to provide an answer to these questions. In particular, the paper has two specific objectives. First, we seek to measure the dropout rate in China's poor rural areas. Second, we try to identify factors correlated with dropping out,

* Corresponding author at: Room 3818, No. Jia 11, Datun Road, Chaoyang, Beijing 100101, China. Tel.: +86 10 6488 8985; fax: +86 10 6485 6533.
E-mail address: yihm.ccap@igsnrr.ac.cn (H. Yi).

0738-0593/$ – see front matter © 2011 Elsevier Ltd. All rights reserved.
doi:10.1016/j.ijedudev.2011.09.002

specifically testing the hypothesis that poverty, poor academic performance, and rising opportunity costs correlate closely with dropout.

This study, to our knowledge, is the first rigorous assessment of dropout in poor rural parts of China after the full implementation of the *liangmian yibu* policy. Among the few studies that use survey data and implement rigorous analysis to examine education attainment in China (such as Brown and Park, 2002; Connelly and Zheng, 2003; Zhao and Glewwe, 2010), no study has investigated standardized test scores as a proxy for academic performance and opportunity costs as correlates of dropout.

While we believe this paper addresses an important issue, there are limitations. First, our dataset is restricted to four counties in two provinces because of funding and organizational resource considerations. Although this fact potentially limits the generalizability of our study to other regions of China, the locations of the study are arguably representative of China's poor western areas. Our sample counties are nationally-designated poor counties, with a range of per capita income from 1000 yuan per year to 2800 yuan per year, which is 67–187% of the current poverty line of 1500 yuan (Wang, 2010). They are also typical in terms of high rates of migrant worker outflow, general lack of fertile cultivated land, and poor transportation infrastructure (Guo and Zhang, 2008).

Second, we are not able to compare our findings to reported dropout rates of junior schools in poor rural areas. The Ministry of Education only publishes a single national figure. Therefore, we would be comparing statistics from a study of four poor counties with the national average.

To answer the central questions of the study, the paper is organized as follows. Section 2 presents the background of the junior high dropout problem in China and what prior studies—outside and inside of China—have found to correlate with dropout. Section 3 describes the data we use in our current study and the statistical approach we use in the analysis. Section 4 analyzes the state of dropout in poor rural China and investigates opportunity cost, poverty, and academic performance as correlates of dropout. Section 5 concludes.

2. Dropouts, poverty and academic performance in competitive school systems

Studies conducted throughout the world have found that poverty correlates closely with low levels of educational attainment and high dropout rates (Brown and Park, 2002; Filmer, 2000). In most developing countries, parents face high immediate costs of education. These costs include tuition fees, expenditures on books, stationery, clothes and fees for exam, sports and other school activities, which often add up to a substantial portion of local disposable income in poor rural areas (Bhatty, 1998). Parents often perceive low returns to educational investment, due in part to the poor quality of local teachers and school facilities (Banerjee et al., 2000; Glewwe and Kremer, 2006; Gould et al., 2004; Hanushek et al., 2008; Rivkin et al., 2005). In 2007 the gross enrollment rate of secondary schools was only 53% in South and West Asia, compared to nearly 100% in North America and Western Europe (UNESCO, 2011).

Even when school tuition/fees are zero, competitive educational systems often still have high dropout rates (Glewwe and Kremer, 2006). Researchers have found that dropout rates are higher in competitive educational systems (those with limited school space, quality-based tracking, and high-stakes entrance tests), in part because lower expectations of achieving success in the system discourage poorly performing students well before they even take the high school or college entrance exams (Chuang, 1997; Clarke et al., 2000; Reardon and Galindo, 2002; Rumberger and Lim, 2008; Valenzuela, 2000). Other research has suggested that schools operating under test-based systems are more likely to push out at-risk students in an effort to raise overall test scores, especially when the reputations of schools are dependent on test results (Velez and Saenz, 2001). Moreover, as teachers are more likely to direct attention toward better-performing students in such systems, the teacher–student relationship is strained for students with academic difficulties (Fortin et al., 2006; Potvin and Rousseau, 1991; Vickers, 1994). Low income and minority students are particularly likely to be taught by poor quality teachers (because their schools generally lack funds) and thereby are at a further disadvantage in competitive educational systems (Hanushek et al., 2004; Orfield and Wald, 2001).

At the same time, as labor shortages drive unskilled wages up, the opportunity cost of schooling rises, especially for secondary school.[1] This effect has been seen even when there are no direct costs associated with schooling, strengthening the reasoning for it being an opportunity cost effect (Angrist and Lavy, 2009; Fizbein and Shady, 2009). As older children are more likely to find a job that has relatively higher rates of pay, age can thus be a critical factor of opportunity cost-induced dropout (Bhatty, 1998). Compounding this opportunity cost, older students are also less likely to advance to the next grade than younger students, ceteris paribus (Barrera-Osorio et al., 2008).

2.1. China's poor rural counties: an area ripe for dropout?

China, too, despite successful development over the past half century, faces many of the problems that have been found internationally to correlate with dropout. China's education system has undergone a dramatic transformation from being virtually non-existent during the Cultural Revolution to boasting one of the largest university systems in the world today. Over the past 60 years, China's literacy rate has increased from 20% to 93.3%, and college attendance has risen from 40,200 students in 1977 to over 20 million in 2010 (NBSC, 2006; People's Daily, 2002). Despite these great successes, the junior high school dropout rate remained high throughout the 1990s, especially in poor rural areas. Two broad surveys conducted in the late 1990s found the rural junior high dropout rate to be 13% (Knight and Song, 2000). Several years later, a third survey conducted by the Central Committee of China Association for Promoting Democracy found the poor rural junior high dropout rate was an average of 40% (Peng, 2004).

In response, China's government began a process of revising the 1986 Compulsory Education Law in early 2000. The government strengthened the requirement for graduating junior high school and devised the *liangmian yibu* (two waivers, one subsidy) program, which officially became a national law in 2006. According to the new policy initiative, elementary and junior high school students no longer paid for tuition or miscellaneous fees. Tuition and fees for junior high, grades 7–9, were to be completely waived. In addition, the state was supposed to offer approximately US$5 per month for each student that was designed to defray the costs of boarding and school meals.

Since the implementation of the policy there are differing views on its success in actually reducing the dropout rate. According to

[1] There have been some suggestions by some authors (e.g., Li, 2003; Xiao, 2002) that the increase in wages could be pegged to certain levels of education, hence increasing the need for higher education to be able to qualify for these jobs. Therefore, to earn higher wages may be an incentive for students to remain in school. Even if this were true, the increase in pay we discuss in this paper is for low-skilled work in factories, which does not generally require higher levels of education. The level of education required by law to work in a factory is junior high graduation, but there are reports of factories either overlooking that rule or falsifying records. Although there may be some incentives to at least finish junior high school in the current system, in terms of process, many people evade that requirement and, in terms of outcome, we find that dropout rate is still very high despite the "requirement."

official statistics, the policy was successful. The government reported that the dropout rate decreased from 8% before the policy to less than 2% in 2007 (NBSC, 2009). During that same period, however, other studies purported higher dropout rates in various regions within China, especially in poor rural areas (Chang, 2010; Chen, 2010; Tian, 2010). A study by Northeast Normal University found the cumulative dropout rate reaching 40% in their study area (Moxley, 2010). These studies, however, were based on limited, non-random samples, and they did not identify why these students had dropped out. Hence, the existing literature, while providing an important stepping stone in our understanding about school dropout, is lacking in more generalizable studies on dropout and its determinants.

Of course, perhaps is not surprising that the problem of drop out persists, given that China is a country with many of the characteristics that are correlated with high dropout rates, it. As mentioned, poverty is highly correlated with dropping out, and while many in China have left the shackles of poverty in the last three decades, many still remain in them. Indeed, studies have often found poverty to be one of the principal correlates of dropout in past decades in China (Brown and Park, 2002; Connelly and Zheng, 2003; Yang and Han, 1991). Other studies have found that poverty-induced conditions such as malnutrition of students and poor quality of schools also strongly affect dropout rates (Brown and Park, 2002; Zhao and Glewwe, 2010). While *liangmian yibu* was promulgated to reduce the direct costs of schooling, the question of whether it was enough to overcome poverty-induced dropout and rising opportunity cost is, as yet, unanswered. One study suggested that dropout rates showed only a marginal improvement (and continued to rise in some, predominantly poor areas) after *liangmian yibu* (Chang, 2010). The author, however, relied on largely anecdotal evidence in making this claim. One of the explicit purposes of *liangmian yibu* was to "not let students drop out of school because of family financial difficulties," and some official and academic sources have claimed that on this front *liangmian yibu* has been successful. However, it is important to know if *liangmian yibu* did, in fact, wipe away or significantly decrease the impact of economic status on dropout rates (Hu, 2008; State Council, 2003). As such, our study aims to examine whether poverty and opportunity cost are correlates of dropout in a post-*liangmian yibu* China.

Furthermore, China has an extremely competitive, test-based educational system, which tends to induce higher dropout rates. Students in China are confronted with highly competitive entrance exams if they are to be promoted from junior high school to high school and from high school to college (Liu et al., 2009). If students from rural China do not score high enough on these exams, they are not allowed to enroll in academic high schools or colleges. It has been reported that in the rural areas of even developed coastal provinces, less than half of the junior high school students are able to test into high schools (Chen, 2008). The reaction of poorly performing students to this competition is usually understood as student boredom (often attributed to dislike of the rote learning structure) in the Chinese literature (Bama, 2010; Jiang and Dai, 2005). Few studies have investigated whether test scores, used as an indicator of poor academic performance, are correlated with dropping out (Su and Ding, 2007).

Finally, the opportunity cost of attending school in China is rising as wages for low-skilled jobs are increasing nationwide. In recent years, labor shortages have plagued a number of industries, contributing to increasing migrant worker wages. Indeed, wages are increasing at 8% per year according to the five-city China Urban Labor Survey conducted in 2001 and 2005 (Han et al., 2009). Another study showed that the real wages for migrant workers increased by 9.8% in 2006 alone (Park et al., 2007). Even when students are performing adequately academically and do not face immediate liquidity constraints, such an increase in the opportunity cost might be a sufficient incentive for many students to consider dropping out. In addition, according to the 2008 China National Rural Survey conducted by the Center for Chinese Agricultural Policy at the Chinese Academy of Sciences, the monthly earnings of the typical unskilled worker (who had off-farm employment in both 2008 and 2009) was 1099 yuan per month, which is comparable to the annual per capita income in poor rural areas (Huang et al., 2011). Thus, opportunity cost-induced dropout is likely highest among poor rural households. Indeed, Chinese media has recently documented numerous rural junior high school students being pulled away from their studies by rising wages for low-skill jobs in coastal provinces (Sina News, 2010, 2011).

Table 1
Description of the study's sample size (number of schools, classes and students), four counties in Northwest China in 2009 (at start of the study).

County	Number of schools	Number of classes		Number of students	
		Grade 7	Grade 8	Grade 7	Grade 8
County A	6	19	16	764	711
County B	10	17	18	771	828
County C	20	32	33	1585	1636
County D	10	31	0	1507	
Total	46	99	67	4636	3175

Data source: Author's survey.
Note: The study from which County D's data come only covered grade 7 students in 2009 and grade 8 students (same students) in 2010. Data are not available for County D which allow us to calculate drop out rates for grade 8 between September 2009 and September 2010.

3. Data and approach

The data for this study were collected during the 2009–2010 and 2010–2011 academic years, forming a panel dataset. The dataset includes information from 46 junior high schools in four impoverished, inland counties in two provinces in Northwest China (Shanxi and Shaanxi Provinces). The sample is comprised of all grade 7 classes in County A, all grade 7 and 8 classes in County D, and a randomly selected one-third of grade 7 and 8 classes in Counties B and C.[2] In every sample class, we surveyed all the students. Thus, the total sample of 7811 students consists of 4636 7th graders from 99 classes and 3175 8th graders from 67 classes in September 2009 (the beginning of the 2009–2010 academic year—Table 1).

Our enumeration team gathered detailed information on a broad array of variables covering students and their families on the student survey form. A description of these variables can be found in Appendix A (Table A1). Specifically, the student survey consisted of four blocks. In the first block, students were asked to fill out a check list of household consumption assets.[3] A value was attached to each asset (based on the National Household Income and Expenditure Survey, which is organized and published by the China National Bureau of Statistics—CNBS, 2008) to produce a single metric of household holdings. The variable of "household

[2] This sample is comprised of two independent surveys with the same survey instruments. Of which, County A, County B, and County C are from one survey conducted in Shaanxi, and County D is from another survey conducted in Shanxi. More information on the two surveys is available from http://reap.stanford.edu/docs/reap_survey_instruments. We do not, however, identify the counties by name to preserve anonymity of the officials and educators that are running the schools in the study area.

[3] These household consumption assets include a series of electric appliances that are most popular in rural households, such as color TV sets, water heaters, DVD players, range hoods, microwave ovens, refrigerators and washing machines (China National Statistics Yearbook, 2008).

consumption asset value" was then produced by summing the value of all household consumption assets.

The second block was a 30 min standardized math test. It is a common practice in the education literature to use tests on basic skills such as math to serve as a measurement of academic performance, instead of teacher-assigned grades that might be less objective (Glewwe et al., 1995; Gruman et al., 2008). The students were closely proctored by the enumeration teams in order to minimize cheating. The test was scored on a scale from 0 to 1. The results we obtained closely approximate a normal distribution, with a mean score of 0.55 points and a standard deviation of 0.17 points for 7th graders and with a mean score of 0.56 points and a standard deviation of 0.18 points for 8th graders. We keep the scores without any further manipulation for the ease of interpretation.

In the third block, enumerators collected data on the characteristics of students. The schooling history was carefully documented. This information was used to generate the variable indicating whether the student had ever been held back in primary school. This variable and math test score form the two variables that represent academic performance and the academic background of the students. The age and gender of each student, also generated from this block of survey created another two variables measuring the individual characteristics of the students. In our data there are around 6% more boys than girls, a similar ratio to that cited in the Ministry of Education's 2009 Annual Yearbook. Approximately 98% of the 7th graders are between ages 11 and 15 and about 99% of the 8th graders are between ages 12 and 16, which is typical of the age range among rural junior high students in China.[4]

The fourth block was designed to collect information on families of the students. From this block of the survey we produced a set of family characteristics, which included another poverty indicator—the number of children in a family (whether the student had two or more siblings). Three variables were also generated to indicate the human capital of the parents: the education levels of the parents (whether the mother of the student had graduated from primary school or above and whether the father of the student had graduated from primary school or above); and the health status of the parents (whether either of the parents were chronically sick or permanently handicapped). Finally, we produced a variable to measure parental care (whether the parents stayed at home for 12 or more months in the past 3 years). These variables, or similar ones, have been used in many studies to explain inter-student differences in academic performance and schooling rates (Behrman and Rosenzweig, 2002; Coleman et al., 1966; Currie and Thomas, 1995; Fryer and Levitt, 2004).

In September 2010 (at the beginning of 2010–2011 academic year), we revisited these schools and tracked these students. This follow-up survey was almost identical to that of the September 2009 first round survey. The standardized math test questions were drawn from the same pool as the year before, but the questions were different. We adhered to the following protocol in order to track the same students as in the first round survey. First, we collected the name and contact information of each student in the 2009 survey. Second, the enumerators had been asked to record the presence of students during the 2010 survey. If the students were absent, the enumerators were to ask classmates for the reason for absence on the survey day (coded as transferred to other schools, dropped out, or on temporary leave due to being ill). Third, after the field survey was over, the enumerators called the parents or guardians of the students (or their neighbors) on the absence list to further confirm whether they had actually dropped out of school (instead of being temporarily absent).

[4] The entrance age of children into primary school in China is 7 years old. It will cost 5–6 years to complete primary school. Repetition and grade skipping are permitted.

3.1. Statistical approach

In estimating the determinants of dropout, we use ordinary least squares (OLS), including a large set of covariates in a regression on student dropout:

$$y_i = \alpha + \beta' P_i + \gamma' A_i + \delta' I_i + \theta' X_i + \varepsilon_i \quad (1)$$

where the dependent variable y_i indicates the dropout status of the student which equals 1 if the student has dropped out in 2009 or 2010 and equals 0 if the student remained in school. P_i is a vector that includes two indicators of poverty: household consumption asset value (the variable equals 1 if the household is in the lowest decile and equals 0 if the household is higher than the lowest decile) and number of siblings of the student (the variable equals 1 if the student has 2 or more siblings and equals 0 if the student has fewer siblings). A_i is a vector that includes two indicators of academic performance: the standardized math test score (on a scale of 0–1) and being held back in primary school (the variable equals 1 if the student has ever been held back and equals 0 if the student has never been held back). I_i is a vector which includes student individual characteristics such as student gender (the variable equals 1 if the student is male and equals 0 if the student is female) and student age. Finally, we also include family characteristics (parents' human capital and parental care) and school-level fixed effects, represented by X_i. Parents' human capital includes two variables indicating the education level of parents (the variable equals 1 if the father/mother of the student has graduated from primary school and equals 0 if he/she has not graduated from primary school) and health status of parents (the variable equals 1 if at least one of the parents are chronically sick or permanently handicapped and equals 0 if neither of them are). We use the length of time that parents stay at home to represent parental care (the variable equals 1 if at least one of the parents have stayed less than 12 months at home in the past 3 years and equals 0 if no one have stayed less than 12 months at home).

We choose OLS to estimate the linear probability model because all covariates in Eq. (1), with the exception of student age and math score, are dummy variables, so the model is almost fully saturated. In the extreme case of a fully saturated model, the linear probability model is completely general and has the fitted probabilities within the interval [0,1] (Angrist, 2001; Wooldridge, 2001). In addition, the model also has the advantage of a straightforward interpretation of the regression coefficients. We compute heteroskedasticity-robust standard errors in all specifications to improve efficiency.

4. Results

This section presents our descriptive and multivariate analysis on the nature and determinants of dropout in poor rural China. First, we describe the dropout rates and who is dropping out most consistently. Second, we attempt to answer why these students drop out by investigating correlations between dropout and three factors: poverty, academic performance and opportunity cost.

4.1. Dropout in poor rural junior high schools in China

4.1.1. How much dropout?

According to our data, the cumulative grade 7 and 8 dropout rate in poor rural China is 14.2% (Table 2). This rate is nearly six times higher than the officially recognized 3-year cumulative junior high school dropout rate of 2.6%. Given that we find (as

Table 2
Dropout rates of students in study's junior high schools (grade 7 and grade 8) between the 2009 and 2010 academic years.

County	Grade 7	Grade 8	Cumulated[a]
County A	5.6	5.8	11.1
County B	3.6	8.0	11.3
County C	5.0	11.0	15.4
County D	7.0	–	–
Average/total	5.7	9.0	14.2

Data source: Author's survey.

[a] The cumulated dropout rate over 2 years of junior high school (between grade 7 and grade 8 and between grade 8 and grade 9) is calculated by assuming 7th graders will drop out at the same rate between grade 8 and grade 9 as the 8th graders in our sample. For example, the total cumulated rate = 1 − (1 − 7th graders' dropout rate) × (1 − 8th graders' dropout rate) = 1 − (1 − 0.057) × (1 − 0.09) = 0.142.

many other studies have found) the dropout rate to be higher in the more advanced grades, the lower-bound estimate for a 3-year cumulative rate in our study area is 23%, nearly nine times the official rate.[5] In terms of dropout rates of different grades, of the 4636 7th graders in the study, 5.7% of students dropped out. During the same year, of the 3175 8th graders, 9.0% of students dropped out.

There was considerable variation in the dropout rate between counties and grades. County D exhibits the highest grade 7 dropout rate and County C the highest grade 8 dropout rate (albeit we collected no grade 8 data from County D). While dropout rates were higher in grade 8 than in grade 7 for all sample counties, the differences between the two grades ranged from 0.1 (County A) to 6 percentage points (County C). It is clear from our data that dropout is still a problem in poor rural China, but also that the problem differs widely based on many local factors.

While we realize that our counties, which are nationally-designated poor counties, are only four of 592 nationally-designated poor counties in China, if these numbers reflect the more general trend, then this means that tens of thousands of students are dropping out of junior high school each year.[6] According to the China Statistical Yearbook, there are approximately 18 million newly enrolled students (13-year olds) in junior high school in China in 2009. Of this number, we estimate about 14% of them live in China's 592 nationally-designated poor counties. This would mean that by 2011 (at which point they should have been entering grade 9), 358,000 (or 14.2%) would have left school before finishing their compulsory education. By the end of the year (June of grade 9, when the students were 16 years old) the number of dropouts might be 580,000 (23%). This total is for those 592 counties and does not include the remaining 86% of China's junior high school students.

4.1.2. Who is dropping out?

What types of students drop out, and what types of families allow their child to drop out? According to cross tabulations from our data, the student most likely to drop out comes from a poor family, which holds few assets and has several other children (Table 3). The students in the lowest decile of consumption asset value drop out at a rate of 25.5%, which is twice as high as that of the rest of the sample. The students with more than 1 sibling have a dropout rate of 20.8%, which is 8.4 percentage points higher than that of the students with fewer siblings. With fewer resources per child, parents may decide that they can only afford to send one child to school due to the costs of schooling.

Table 3
Dropout rate by different categories of students in study's junior high schools (grade 7 and grade 8) between the 2009 and 2010 academic years.

Variables	Grade 7	Grade 8	Cumulated[a]
Poverty correlates			
Consumption asset value			
Lowest 10% students	9.3	17.9	25.5
Others	5.3	8.1	12.9
Siblings			
2 or more siblings	8.3	13.6	20.8
Others	4.6	8.1	12.4
Academic performance correlates			
Math score			
Lowest quintile	9.1	16.4	24.0
Second quintile	7.7	9.4	16.4
Third quintile	5.6	7.6	12.8
Fourth quintile	2.1	5.4	7.3
Highest quintile	1.3	4.3	5.6
Held-back			
Ever held back in primary school	8.3	12.6	19.8
Never held back	4.6	7.3	11.6
Student's individual characteristics correlates			
Gender			
Male	6.6	8.8	14.8
Female	4.8	9.3	13.7
Age			
14+ years old	21.8	19.9	37.4
Others	4.5	4.9	9.1
Parents' human capital			
Mom's education			
Mom did not graduate from primary school	8.1	14.0	21.0
Others	5.3	8.0	12.9
Dad's education			
Dad did not graduate from primary school	12.5	17.4	27.7
Others	5.3	8.5	13.3
Parents' health status			
One or both of parents are chronically sick or permanently handicapped	9.2	14.9	22.8
Others	5.1	8.0	12.7
Parental care			
Accumulated months that parents stayed at home in the past 3 years			
Less than 12 months	7.9	13.0	19.9
Others	5.5	8.5	13.6

[a] The cumulated dropout rate is calculated in the same way as in Table 2.

Dropouts also tend to be students who are doing relatively poorly in their academic studies. The typical dropout scores poorly on tests and has been held back at least one grade during primary school. Each quintile drop in math score was associated with an increase in dropout (range from 2 to 8 percentage points), with 24.0% of those in the lowest quintile dropping out. The percentage of those who had been held back for a grade in primary school who then dropped out in junior high school was approximately twice as high as the percentage of those who had not been held back. Students who perform poorly academically may feel disenfranchised, discouraged, or even alienated from the educational system, leading to their dropping out from school.

There is also evidence that characteristics associated with high opportunity costs of schooling are correlated with higher dropout rates. For example, older students are more likely to drop out. According to Table 3, students older than 14 have a dropout rate of 37.4% and those younger than 14 have a dropout rate of 9.1%. While there may be a number of reasons, perhaps older students are more likely to leave home for work since it is easier for them to be employed as a low-skilled worker. Furthermore, they may receive better pay than the younger students. The typical dropout is not

[5] Many studies suggest that dropout rates peak in grade 9 (Chang, 2010; Yuan et al., 2004). Our interviews with principals and teachers in the study area also indicated that many students drop out of school in the first semester of grade 9 and that the dropout rate is at least 10% in the last academic year in junior high school. Given that we found an average dropout rate in grade 8 of over 9%, meaning that 10% seems a feasible dropout rate for grade 9.

[6] Counties with an annual rural net income per capita below 150 yuan in 1985 are designated by the central government nationally-designated poor counties (more information on the selection of nationally-designated poor counties is available in Rozelle et al., 2003).

necessarily one gender or another, although with some nuance between grades: at grade 7 it is boys who are more likely to drop out while at grade 8 girls seem to drop out more.

Family characteristics are systematically related to dropping out. The dropout's mother and/or father are more likely to have an education level lower than primary school. If one or both of the parents are sick or handicapped, it increases the dropout rate of the student by 10.1 percentage points. The parents of the dropouts are also frequently away from home.

While the cross tabulations in this subsection are interesting, the findings underline the importance of conducting multivariate analysis. It could be that there are correlations between the parent characteristics and other characteristics such as poverty, academic performance, and individual characteristics. In an effort to isolate the effects of these characteristics, in the next section we analyze the dropout decision of students using a set of multivariate models.

4.2. Multivariate analysis: correlates of dropout

This section presents our multivariate analysis of the dropout correlates to determine which student and family characteristics influence the dropout decision the most, seeking to understand why students drop out of school. Through this analysis, which is similar to the descriptive statistics, we have identified three major dropout correlates: poverty, academic performance and opportunity cost.

4.2.1. Poverty, disease, and liquidity: poverty as a dropout determinant

As one of our primary questions is whether poverty is increasing dropout, we look at poverty as a liquidity constraint. We use four measures of liquidity constraint: the value of household consumption assets, the number of siblings of the student, education levels of the parents, and parental health.

By estimating Eq. (1), we find that assets and the number of siblings are significantly correlated with dropout (Table 4). Students from families in the lowest decile of consumption assets have a dropout rate 2.9 percentage points higher than other students. Students with more than one sibling exhibited a further 1.5 percentage point increase in dropout (column 5). These two variables retain their significance and impact even though their correlation coefficients fall slightly in the specifications with other covariates (columns 1–5). Even within the same community, with the same test scores, and having parents of a similar background, students whose families had fewer resources per child were more likely to decide to drop out. While this is consistent with findings from numerous other studies, it unfortunately shows that the government's program to eliminate tuition and fees (*liangmian yibu*) does not appear to be enough to level the educational playing field for China's rural poor. This leads us to believe that making education free and compulsory was not enough to stop dropout.

We find that low parental human capital, as an implicit measure of poverty, also correlates with higher dropout rates.[7] However, our results differ from other studies (Knight and Song, 2000; Wang and Yuan, 1993; Zhao and Glewwe, 2010) in that we find that the father's, but not mother's education is significantly correlated with dropout rate (Table 4, columns 4–5). This seems to contradict the belief that women's education is the key to children's education. While this still may be true in other contexts, our data seems to imply that the father's education is more critical to the dropout decision, possibly because he is the chief decision maker in terms of dropout. The size of the coefficient (4.2 percentage points) is large, especially given that the overall accumulated dropout rate is only 14.2% (column 5).

During interviews with students in our sample, we found a striking number of students who had left school to help pay for medication for a sick parent or parents. We empirically test this hypothesis and find that parental sickness or infirmity, another measure of poverty, is significantly correlated with dropout. Having at least one parent who is chronically sick or permanently handicapped increases the probability of dropping out by 3.4% (Table 4, column 5). This could be due to a liquidity constraint as families need cash to pay for medications and doctors' bills. Beyond the direct costs, however, there is also the cost of forgone wages of the parents due to illness. As such, sending children to work can bring much needed income.

A final measure of poverty, parental care, shows that parents who are away from their children most of the time as migrant workers correlates significantly with dropout.[8] The parents who stay less than 12 months at home are 2.4 percentage points more likely to have their children drop out of school (Table 4, column 5). This could be because of a lack of parental support for their education and/or as an indicator of liquidity constraint. This factor has added significance due to the increasing number of children left behind in rural areas as both of their parents migrate for work.

4.2.2. Giving up after a bad report card: poor academic performance as a dropout determinant

Our second main hypothesis is that poor academic performance is correlated with dropout. In testing, we found that our two measures of academic performance—score on a standardized math test and being held back during primary school—were both significantly correlated with dropout (Table 4).

For a 10 percentage point improvement in math test scores, students exhibited a 1.3 percentage point decrease in likelihood of dropping out (Table 4, column 5). Exam scores retained significance and magnitude of its coefficient in all specifications, suggesting that the finding is robust (columns 3–5). As mentioned in Section 2, we found only one other dropout study conducted in China that measured the impact of academic performance. However, that study used grades, which are often thought to be a less generalizable indicator. In contrast, test scores like those used in our studies, are comparable across schools and regions.

Students held back for one or more grades are shown to have a 3.5 percentage point higher dropout rate (column 2). However, the variable loses significance with the addition of age to the right hand side (columns 3–5). It is difficult to separate these two because older students also tended to repeat grades, but our data indicate that age is the stronger correlate of dropout.

[7] We are following the literature that parental education is used to proxy the economic well-being of the household (Gottschalk et al., 1994; Sen, 1985, 1987; Ravallion, 1996). We recognize, however, that there could be an alternative interpretation. For example, in some papers (e.g., Becher, 1985; Henderson and Berla, 1994) researchers suggest that the education of parents can also have an impact on the dropout rate of their children through alternative channels—e.g., through the norms that are created inside the household and transmitted from generation to generation or through the taste for education of the parents. Either way (that is, whatever the mechanism—either through poverty or some other channel), our analysis demonstrates that parental education is an important correlate of dropping out and should be considered as such (whether it is termed "poverty" or something else).

[8] Of course, there could be an alternative interpretation. For example, we know from the literature (e.g., Amuedo-Dorantes and Pozo, 2010; Chen et al., 2009) that when parents go to the city to find work it can have a different effect on schooling of their children. On the one hand, as we have suggested, it could reduce parental care and lead to higher dropout rates. On the other hand, the higher income generated by getting a job in the city could make it less likely that a household's child would drop out. According to our analysis, children who are left behind when parents go to the cities to find work generally have worse educational outcomes. Hence, although it might be true that there is a positive income effect associated with migration (that is the higher income from migration could reduce dropout), the income effect in this case is more than offset (negatively) by the parental care effect.

Table 4
Ordinary least squares estimation results of the determinants of dropout decisions of students in sample junior high schools in rural China.

Dependent variable: dropout status of student, 1 = student has dropped out, 0 = student remains in school	(1)	(2)	(3)	(4)	(5)
Poverty correlates					
Consumption asset value (=1 if located the lowest 10%; =0 otherwise)	0.053***	0.048***	0.034***	0.029**	0.029**
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Siblings (=1 if have 2 or more siblings; =0 otherwise)	0.029***	0.026***	0.016*	0.015*	0.015*
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Academic performance correlates					
Math score (Full score = 1)		−0.157***	−0.131***	−0.129***	−0.128***
		(0.019)	(0.019)	(0.019)	(0.019)
Held back (=1 if ever held back in primary school; =0 otherwise)		0.035***	−0.001	0.000	−0.001
		(0.007)	(0.007)	(0.007)	(0.007)
Student's individual characteristic correlates					
Male (=1 if male; =0 if female)			0.004	0.005	0.005
			(0.006)	(0.006)	(0.006)
Age (year)			0.050***	0.048***	0.048***
			(0.004)	(0.004)	(0.004)
Parents' human capital correlates					
Mom's education (=1 if graduated from primary school or above; =0 otherwise)				0.005	0.004
				(0.009)	(0.009)
Dad's education (=1 if graduated from primary school or above; =0 otherwise)				−0.042***	−0.042***
				(0.016)	(0.016)
Health (=1 if one or both of parents are chronically sick or permanently handicapped; =0 otherwise)				0.034***	0.034***
				(0.010)	(0.010)
Parental care					
Accumulated months that parents stayed at home in the past 3 years (=1 if less than 12 months; =0 otherwise)					0.024**
					(0.012)
School dummies	Yes	Yes	Yes	Yes	Yes
Constant	0.042***	0.120***	−0.550***	−0.504***	−0.504***
	(0.009)	(0.015)	(0.048)	(0.053)	(0.053)
Observations	7800	7798	7771	7745	7745
R-square	0.028	0.043	0.078	0.082	0.083

Note: Robust standard errors in parentheses.
* Significant at 10%.
** Significant at 5%.
*** Significant at 1%.

4.2.3. The negative impact of a bigger paycheck: opportunity cost as a dropout determinant

With continually increasing wages for low-skilled jobs, the opportunity cost of schooling has been rising (Han et al., 2009). Real mean monthly wage of migrant workers rose from 781 yuan in 2003 (Zhao and Wu, 2007) to 1165 yuan measured with 2003 price in 2009 (NBSC, 2010). Rising wages are occurring at the same time as increased worker mobility. One official estimate of the number of intranational migrant workers in China in 2010 was 210 million (Xinhua, 2010). Mobility further increases the opportunity cost of education because higher wages even in distant parts of the country can draw poor rural students away from their studies.

Multivariate analysis corroborates the descriptive findings on age, which has been used as a proxy for opportunity cost in many studies (e.g., Charles and Luoh, 2003; Wetzel et al., 1999). In Table 4 column 5 we see a 4.8 percentage point dropout rate increase per year of age. What is more, the addition of age reduces the significance and coefficients of both the variable of siblings and being held back in primary school, indicating that some of what could be interpreted as liquidity constraint or poor academic performance may actually be opportunity cost affecting dropout. This finding, while not unique to China, has special significance in China due to the huge number of migrant workers and increasing wages.

5. Conclusion

In this study we have shown that dropout rates remain around 14.2% in the four poor rural counties we studied. Although our study area is not representative of all of China, it is similar to most other poor inland counties in China. There seem to be three major reasons for dropout: liquidity constraints, poor academic performance in a competitive educational system, and rising opportunity cost.

Overall, despite several years of full implementation of China's new no-tuition/no-fee, compulsory education policy (*liangmian yibu*), it is clear that financial factors still play a significant role in determining dropout decision.[9] As such, *liangmian yibu* is merely a first step toward equity of educational opportunity. While *liangmian yibu* reduced direct costs, in some cases nearly to zero, it appears as if many students still drop out because of household liquidity constraint (because of indirect costs of education, e.g., boarding or transportation) or rising opportunity costs. Therefore, there may be a need for the government to take action to try to rectify this situation. One possibility is for the school system to provide positive cash incentives for schooling among at-risk populations. This could come in the form of a conditional cash transfer, as has been used with general success in many Latin American countries (Attanasio et al., 2006; Rawlings, 2004; Rawlings and Rubio, 2005).[10]

In addition to poverty, academic performance had a large effect on dropout. In a competitive educational system such as China's

[9] In fact, poverty is a complicated issue which has multiple causes and needs multiple approaches to solve. Our paper illustrates part of its complexity by showing the fact that, while providing free education has played a role in promoting educational attainment, once this was accomplished, other factors—including some that are associated with being poor—remained significant determinants of an increasing dropout rate. In addition to measures of poverty, we, therefore, address problems of opportunity cost and other indirect costs to schooling.

[10] In no way do we want to suggest that China is underperforming in terms of school participation compared to other countries. In fact, other countries can have high dropout rates even when education is free. The reasons for this can be manifold, including poor quality of education (e.g., Ampiah and Adu-Yeboah, 2009 talks about this for Ghana); perception of low returns for an additional year of school (e.g, Bedi and Edwards, 2002 talks about this for Honduras); the need for the labor of the child on the farm, watching livestock or raising other siblings (e.g., Tan et al., 1999 writes about this in the case of the Philippines); etc.

with a limited number of seats in secondary and post-secondary schools and selection based on standardized test scores, it is likely that poorly performing students and their parents may feel that their comparative advantage lies, instead, in the workforce. This finding also offers a plausible operationalization of the "student dislike of studying" found in the Chinese literature (Bama, 2010; Jiang and Dai, 2005). As we found in interviews, students generally responded negatively to perceived failure in their studies by disliking a particular subject they were not doing well in, or even school itself, then often avoiding it and continuing to do worse in it. Whether the poor performance or the dislike came first is hard to say, but the two often form a vicious cycle that may end in dropping out. Tutoring and remedial courses are potential avenues for addressing this cycle, which would not only improve academic outcomes but also help students progress at a younger age, thus avoiding the rising opportunity costs associated with increasing age. This solution also requires less systemic change than the wholesale reform of China's largely rote system often proposed in the education literature.

In the end, the question comes down to one of convincing students such as Yanyan and Haibin (and their families) to continue with their studies, whether through more value added by the school or direct incentives to the family and student. With an ever-increasing opportunity cost of the wages associated with migrant work and an ever-evolving job market, the research field must be both innovative and rigorous to combat the problems such students face in making such life-changing decisions.

Appendix A

Table A1
Description of variables used in the study.

Variable	Obs.	Mean	SD	Min	Max
Poverty					
Consumption asset value (=1 if located the lowest 10%; =0 otherwise)	7800	0.10	0.30	0	1
Siblings (=1 if have 2 or more siblings; =0 otherwise)	7802	0.24	0.43	0	1
Academic performance and background					
Math score (full score = 1)	7800	0.55	0.18	0.05	1
Held-back (=1 if ever held back in primary school; =0 otherwise)	7798	0.31	0.46	0	1
Student's individual characteristics					
Male (=1 if male; =0 if female)	7774	0.53	0.50	0	1
Age (year)	7799	13.45	1.10	9	20
Parents' human capital					
Mom's education (=1 if graduated from primary school or above; =0 otherwise)	7802	0.84	0.36	0	1
Dad's education (=1 if graduated from primary school or above; =0 otherwise)	7802	0.94	0.24	0	1
Health (=1 if one or both of parents are chronically sick or permanently handicapped; =0 otherwise)	7774	0.15	0.35	0	1
Parental care					
Accumulated months that parents stayed at home in the past 3 years (=1 if less than 12 months; =0 otherwise)	7802	0.09	0.29	0	1

References

Amuedo-Dorantes, C., Pozo, S., 2010. Accounting for remittance and migration effects on children's schooling. World Development 38 (12), 1747–1759.

Angrist, J., 2001. Estimation of limited-dependent variable models with binary endogenous regressors: simple strategies for empirical practice. Journal of Business and Economic Statistics 19 (1), 2–16.

Angrist, J.D., Lavy, V., 2009. The effect of high-stakes high school achievement awards: evidence from a group-randomized trial. American Economic Review 99 (4), 1384–1414.

Ampiah, J.G., Adu-Yeboah, C., 2009. Mapping the incidence of school dropouts: a case study of communities in Northern Ghana. Comparative Education 45 (2), 219–232.

Attanasio, O., Fitzsimons, E., Gomez, A., Lopez, D., Meghir, C., Mesnard, 2006. Child education and work choices in the presence of a conditional cash transfer programme in rural Colombia. CEPR Discussion Paper No. 5792. Retrieved from http://ssrn. com/abstract=936221.

Bama, A.-M., 2010. A review of the past ten years of research on elementary and junior high school student dropout in China. Journal of Sichuan University for Nationalities 19 (2), 92–96 (in Chinese).

Banerjee, A., Jacob, S., Kremer, M., Lanjouw, J., Lanjouw, P., 2000. Promoting School Participation in Rural Rajasthan: Results from Some Prospective Trials. Mimeo, MIT.

Barrera-Osorio, F., Bertrand, M., Linden, L.L., Perez-Calle, F., 2008. Conditional cash transfers in education: design features, peer and sibling effects evidence from a randomized experiment in Colombia. NBER Working Paper 13890.

Behrman, J., Rosenzweig, M., 2002. Does increasing women's schooling raise the schooling of the next generation? The American Economic Review 92 (1), 323–334.

Becher, R.M, 1985. Parent involvement: a review of research and principles of successful practice. In: Katz, L.G. (Ed.), Current Topics in Early Childhood Education, vol. VI, 1985 (est.). Ablex Publishing Corporation, Norwood, NJ.

Bedi, A.S., Edwards, J.H.Y., 2002. The impact of school quality on earnings and educational returns—evidence from a low-income country. Journal of Development Economics 68 (1), 157–185.

Bhatty, K., 1998. Educational deprivation in India: a survey of field investigations. Economic & Political Weekly 33 (27), 1731–1740.

Brown, P., Park, A., 2002. Education and poverty in rural China. Economics of Education Review 21, 523–541.

Chang, B.-N., 2010. A survey of the current status of children dropping out after the implementation of the free compulsory education policy—the case of three northwestern provinces. Shanghai Jiaoyu Keyan 2010 (2), 28–31 (in Chinese).

Charles, K.K., Luoh, M.-C., 2003. Gender differences in completed schooling. Review of Economics and Statistics 85 (3), 559–577.

Chen, J., 2010. Why students dropped out of rural junior high schools and its solutions. China Education Innovation Herald (21), 228 (in Chinese).

Chen, S., 2008. High school education in underdeveloped areas. China Education Innovation Herald (23), 164–165.

Chen, X., Huang, Q., Rozelle, S., Shi, Y., Zhang, L., 2009. Effect of migration on children's education performance in rural China. Comparative Economic Studies 51, 323–343.

China National Bureau of Statistics, 2008. China Statistical Yearbook. China National Bureau of Statistics, Beijing.

Chuang, H.-L., 1997. High school youths' dropout and re-enrollment behavior. Economics of Education Review 16 (2), 171–186.

Clarke, M., Haney, W., Madaus, G., 2000. High stakes testing and high school completion. National Board on Educational Testing and Public Policy 1 (3).

Coleman, J.S., Campbell, E., Hobson, C., McPartland, J., Mood, A., Weinfeld, F., et al., 1966. Equality of Educational Opportunity. National Center for Educational Statistics, Washington, DC.

Connelly, R., Zheng, Z.-Z., 2003. Determinants of school enrollment and completion of 10 to 18 year olds in China. Economics of Education Review 22 (4), 379–388.

Currie, J., Thomas, D., 1995. Does head start make a difference? The American Economic Review 85 (3), 341–364.

Filmer, D., 2000. The structure of social disparities in education. World Bank Policy Research Working Paper 2268. World Bank, Washington, DC.

Fizbein, A., Shady, N., 2009. Conditional Cash Transfers: Reducing Present and Future Poverty. World Bank, Washington, DC.

Fortin, L., Marcotte, D., Potvin, P., Royer, E., Joly, J., 2006. Typology of students at risk of dropping out of school: description by personal, family and school factors. European Journal of Psychology of Education XXI (4), 363–383.

Fryer, R., Levitt, S., 2004. Understanding the black-white test score gap in the first two years of school. The Review of Economics and Statistics 86 (2), 447–464.

Glewwe, P., Grosh, M., Jacoby, H., Lockheed, M., 1995. An Eclectic Approach to Estimating the Determinants of Achievement in Jamaican Primary Education. Economic Review 9 (2), 231–258.

Glewwe, P., Kremer, M., 2006. Schools, teachers, and education outcomes in developing countries. In: Hanushek, E.A., Welch, F. (Eds.), Handbook of the Economics of Education. Amsterdam, North Holland, pp. 943–1017.
Gottschalk, P., Mc Lanahan, S., Sandefur, G.D., 1994. The dynamics and intergenerational transmission of poverty and welfare. In: Danziger, S.H., Sandefur, G.D., Weinberg, D.H. (Eds.), Confronting Poverty: Prescriptions for Change. New York Harvard University Press, pp. 85–108.
Gould, E., Lavy, V., Paserman, D., 2004. Immigrating to opportunity: the effect of school quality using a natural experiment on Ethiopians in Israel. Quarterly Journal of Economics 119 (2), 489–526.
Gruman, D.H., Harachi, T.W., Abbott, R.D., Catalano, R.F., Fleming, C.B., 2008. Longitudinal effects of student mobility on three dimensions of elementary school engagement. Child Development 79, 1833–1852.
Guo, J., Zhang, W., 2008. The research on the economic development of XX (County name). Journal of Shanxi Agricultural University (Social Science Edition) 7 (3).
Han, J., Cui, C., Fan, A., 2009. Rural labor-force allocation report—an investigation of 2,749 villages. In: Fang, C., Yang, D. (Eds.), The China Population and Labor Yearbook, Volume 1: The Approaching Lewis Turning Point and Its Policy Implications. Brill, Leiden, The Netherlands, pp. 137–152.
Hanushek, E.A., Kain, J.F., Rivkin, S.G., 2004. Why public schools lose teachers. Journal of Human Resources 39 (2), 326–354.
Hanushek, E.A., Lavy, V., Hitomi, K., 2008. Do students care about school quality? Determinants of dropout behavior in developing countries. Journal of Human Capital. University of Chicago Press 2 (1), 69–105.
Huang, J., Zhi, H., Huang, Z., 2011. The impact of the global financial crisis on off-farm employment and earnings in rural China. World Development 39 (5), 797–807.
Henderson, A.T., Berla, N., 1994. A New Generation of Evidence: The Family is Critical to Student Achievement. National Committee for Citizens in Education, Washington, DC.
Hu, P.-P., 2008. Perfect the system, increase input, and promote a more equitable education: thoughts after the implementation of the new mechanism for assured funding for rural compulsory education. Chinese Education and Society 41 (1), 69–74.
Jiang, Z.-Y., Dai, H.-S., 2005. Reducing the rate of dropout in rural junior high school and reforming the system of compulsory education. Population Science of China (April).
Knight, J., Song, L., 2000. Differences in Educational Access in Rural China. Mimeo. Department of Economics, University of Oxford, UK.
Li, H., 2003. Economic transition and returns to education in China. Economics of Education Review 22 (3), 317–328.
Liu, C., Zhang, L., Luo, R., Rozelle, S., Sharbono, B., Shi, Y., 2009. Development challenges, tuition barriers, and high school education in China. Asia Pacific Journal of Education 29 (4), 503–520.
Moxley, M., 2010. Alarming School Dropout Rate Blamed on Teaching Methods. Inter Press Service, 30 June 2010. Retrieved from http://ipsnews.net/news.asp?idnews=52002.
National Bureau of Statistics of China, 2006. China Statistical Yearbook. China Statistics Press, Beijing.
National Bureau of Statistics of China, 2009. China Statistical Yearbook. China Statistics Press, Beijing.
National Bureu of Statistics of China, 2010. The monitoring report of migrant workers in 2009. Retrieved from http://www.stats.gov.cn/tjfx/fxbg/t20100319_402628281.htm.
Orfield, G., Wald, J., 2001. High stakes testing. In Motion Magazine April 2001.
Park, A., Cai, F., Du, Y., 2007. Can China meet her employment challenges? In: Paper Presented at the Conference on Growing Pains: Tensions and Opportunity in China's Transformation, Stanford University, November, 2007.
Peng, B., 2004. Rural grade 8 student dropout rate exceeds 40% (in Chinese). China Youth Daily, 14 June 2004. Retrieved from http://zqb.cyol.com/gb/zqb/2004-06/14/content_887770.htm.
People's Daily, 2002. Illiteracy rate among adult people in China slashed. People's Daily, 18 November 2002. Retrieved from http://english.peopledaily.com.cn/200211/18/eng20021118_106987.shtml.
Potvin, P., Rousseau, R., 1991. Les attitudes reciproques des enseignants et des eleves en difficultes scolaires. Rapport de recherche subventionne par le FCAR (EQ 3562). Revue Canadienne de l'Education 18 (2), 132–149.
Ravallion, M., 1996. Issues in measuring and modelling poverty. The Economic Journal 106 (438), 1328–1343.
Rawlings, L., 2004. A new approach to social assistance: Latin America's experience with conditional cash transfer programs. The World Bank: Social Protection Discussion Papers, 30165. Retrieved from http://ideas.repec.org/s/wbk/hdnspu.html.
Rawlings, L., Rubio, G., 2005. Evaluating the impact of conditional cash transfer programs. World Bank Research Observer 20 (1), 29–55.
Reardon, S., Galindo, C., 2002. Do high-stakes tests affect students? Decisions to drop out of school? Evidence from NELS. In: Paper Presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.
Rivkin, S.G., Hanushek, E.A., Kain, J.F., 2005. Teachers, schools, and academic achievement. Econometrica 73 (2), 417–458.
Rozelle, S., Zhang, L.X., Huang, J.K., 2003. China's war on poverty. In: Hope, N.C., Yang, D.T., Li, M.Y. (Eds.), How Far Across the River? Chinese Policy Reform at the Millennium. Stanford University Press, p. 235.
Rumberger, R., Lim, S.-A., 2008. Why students drop out of school: a review of 25 years of research. California Dropout Research Project, Policy Brief 15.
Sen, A., 1985. Commodities and Capabilities. North-Holland, Amsterdam.
Sen, A., 1987. The Standard of Living. Cambridge University Press, Cambridge.
Sina News, 2010. Alarm! Child labor in manufacturing industries. http://news.sina.com.cn/c/2010-07-17/142820700245.shtml.
Sina News, 2011. No way to curb child labor? Comments from Gangqiao Wang. http://news.sina.com.cn/pl/2011-04-01/073322220386.shtml.
State Council, 2003. State council decision on further strengthening rural education work. 2003(19). Retrieved from http://www.gov.cn/zwgk/2005-08/13/content_22263.htm.
Su, Q., Ding, Y., 2007. Analyzing influential factors of rural children dropping out during junior high school: the case of rural areas in Northern Fujian. Zhongguo Nongcun Jingji (Chinese Rural Economy) 2007 (6), 39–45 (in Chinese).
Tan, J.P., Lane, J., Lassibille, G., 1999. Student outcomes in Philippine elementary schools: an evaluation of four experiments. World Bank Economic Review 13 (3), 493–508.
Tian, D., 2010. The pain of education—feelings of students dropping out of school. Modern Education Science 1, 37 (in Chinese).
UNESCO, 2011. Regional average of enrollment ratios for pre-primary to tertiary education (ISCED 0-6). UNESCO Public Reports-Education. Retrieved from http://stats.uis.unesco.org/unesco/TableViewer/tableView.aspx?ReportId=194.
Valenzuela, A., 2000. The significance of the TAAS test for Mexican immigrant and Mexican American adolescents: a case study. Hispanic Journal of Behavioral Sciences 22, 524–539.
Velez, W., Saenz, R., 2001. Toward a comprehensive model of the school leaving process among Latinos. School Psychology Quarterly 16, 445–467.
Vickers, H.S., 1994. Young children at risk: difference in family functioning. Journal of Educational Research 87, 262–270.
Wang, S., Yuan, M., 1993. Children's education and problems in China. In: 1992 Children Survey of China, China Statistics Press, Beijing (in Chinese).
Wang, X., 2010. China's poverty line to be raised to 1500 yuan (in Chinese). Southern Weekly, 27 December 2010. Retrieved from http://www.infzm.com/content/53950.
Wetzel, J.N., O'Toole, D., Peterson, S., 1999. Factors affecting student retention probabilities: a case study. Journal of Economics and Finance 23 (1), 45–55.
Wooldridge, J.M., 2001. Econometric Analysis of Cross Section and Panel Data. MIT Press, Cambridge.
Xiao, J., 2002. Determinants of salary growth in Shenzhen, China: an analysis of formal education, on-the-job training, and adult education with a three-level model. Economics of Education Review 21 (6), 557–577.
Xinhua, 2010. China's "floating population" exceeds 210 million. Xinhua, 26 June 2010. Retrieved from http://news.xinhuanet.com/english2010/china/2010-06/26/c_13371085.htm.
Yang, N.-L., Han, M., 1991. School enrollment, dropping out, and grade repetition in primary and junior high school in China. Education and Research 45–57 (in Chinese).
Yuan, G.-L., Hong, J., Li, B.-L., Qin, Y.-Y., 2004. A Survey of the Problem of Rural Junior High School Student Dropout. Institute of Rural Education, China Northeastern Normal University (in Chinese).
Zhao, C., Wu, Z., 2007. In: Cai, F., Du, Y. (Eds.), Report on Migrants' Wages and Salaries. The Coming Lewisian Turning Point and Its Policy Implications: Reports on China's Population and Labor. Social Sciences Academic Press (China), Beijing.
Zhao, M., Glewwe, P., 2010. What determines basic school attainment in developing countries? Evidence from rural China. Economics of Education Review 29 (2010), 451–460.