

Development Challenges, Tuition Barriers, and High School Education in China

Chengfang Liu,* Linxiu Zhang and Renfu Luo
Center for Chinese Agricultural Policy
Chinese Academy of Sciences

Scott Rozelle and Brian Sharbono
Shorenstein Asia-Pacific Research Center
Freeman Spogli Institute for International Studies
Stanford University

Yaojiang Shi
Northwest Socio-economic Development Research Center
School of Economics and Management
Northwest University, China

Key words: development, education, high school, tuition, China

*Corresponding author:

Center for Chinese Agricultural Policy
Institute of Geographical Sciences and Natural Resource Research
Chinese Academy of Sciences
Anwai Datun Road 11A, Chaoyang District
Beijing, 100101, China
Email: cfliu.ccap@igsnr.ac.cn
Phone: 86-10-6488-8990
Fax: 86-10-6485-6533

The authors would like to thank Qiran Zhao and Ai Yue for their research assistance.

Development Challenges, Tuition Barriers, and High School Education in China

Abstract

China has made remarkable progress along the path of economic transformation over the past three decades. To continue its rapid growth in an economy with increasingly higher wages, China's key challenge is whether it can become competitive in quasi-skilled and skilled industrial sectors so that upscale factories can be induced to establish themselves in China? This study seeks to increase our understanding of high school education in China at a time when the nation is facing challenges in its development path. Using secondary statistics, we have found that educational access at the high school level is quite low—especially in poorer areas of rural China. We argue that the low level of access to high school education in China may be a problem resulting from high tuition and fees. We include empirical evidence about the tuition barrier argument by using a survey of 41 developing and developed countries and a representative survey of 1,177 students from one of China's poorest provinces. We demonstrate that not only is financing high school a burden for the families of poor students, but also there is little financial aid available. The quality of education of students from poor rural areas prior to entering high school is also a problem. We conclude with a recommendation that in poor rural areas of China high school should be made free, as it is in most of the rest of the world—and efforts should be made to improve rural education in general.

Key words: education, high school, tuition, China

Development Challenges, Tuition Barriers, and High School Education in China

China has made remarkable progress along the path of economic transformation over the past three decades (Brandt, Rawski, & Sutton, 2008). This transformation has important implications not only for poverty alleviation, but also for the growth of the entire economy. While there is no study that quantifies the extent of the contribution of the transformation, there is little doubt that much of the progress in poverty reduction and productivity growth was due to industrialization, and that China's industrialization was in no small part built on low wages. It is also well known that, after the onset of reform, China's unskilled wage rate did not rise for more than two decades (Park, Cai, & Du, 2007).

But the days of access to persistently low-wage labor by factory managers and service providers may be ending. A recent study using nationally representative data shows that, starting in 2003, the unskilled, off-farm wage rate increased approximately 15 percent per annum (Park, Cai, & Du, 2007). In fact, it is not surprising that the wage rate is rising in recent years since, as shown in the rural off-farm employment data, there is nearly "no one left in China's villages" (at least in the younger cohorts). Demography and high rates of employment for key cohorts of the labor force appear to be bringing the era of cheap labor in China to an end.

While rising wages will be good for poverty alleviation and will contribute to higher welfare in large segments of the rural population, they also will lead to new industrialization and modernization challenges. In fact, signs are emerging that there is already an effect. It has been reported that many low-wage firms in China are closing down and multinational companies are beginning to shift their investments to labor-intensive industries in places outside of China (Xu & He, 2008; Chen, 2008a). On the one hand, this may not be a problem

if the firms that are moving are the ones offering low wage rates with poor working conditions (Chen, 2008a). Yet, the situation presents other challenges. If China's economy seeks to continue to have high rates of employment at higher wage rates, China's industries will have to begin to move themselves up the productivity ladder (Zi & Xu, 2006; Chen & Su, 2008). Thus, the real challenge that China faces is: Can it become competitive in quasi-skilled and skilled industrial/service sectors in a way that more technologically advanced factories and service-sector firms can be induced to establish themselves in China (or can emerge from investment by individuals inside China) to take the place of the exiting low-wage firms?

When thinking about whether or not China is ready to meet this challenge, there are few people who disagree that China has the entrepreneurship, logistics, and the infrastructure to help the nation continue to modernize. Despite the many reasons for optimism, there are still several key questions to be answered. Is China's labor force prepared to take on the task of technology advancement? Is China putting its future development at risk by under-educating its rural population? It is well known in the development literature that one of the keys to staying competitive globally is to have a well educated labor force able to deal with newer and more sophisticated technologies in an ever-changing work place (World Bank, 2005; Bernanke, 2007; Holz, 2008). At the same times in their historical development paths, China's Asian neighbors, Japan and South Korea, were sending almost all students to high school (OECD, 2007; Zhang & Zhang, 2008).

China's own statistical sources demonstrate that the concern about the nation's educational capabilities are well founded. Even as late as 2006, only 11 percent of the rural labor force was enrolling into a rural high school (NBS, 2007a). A majority of the rest of the labor force was graduating from junior high school (i.e., they received 8 to 9 years of education) and either entering the labor force or attending a technical high school or

vocational training program. The levels of math, Chinese language, and English of junior high graduates do not meet the needs of the modern work place—even for the good students (World Bank, 2005). Since rural China will be providing a large share of the labor force in the coming years for the nation’s factories and service enterprises, there is a danger that the nation could fail to meet its new challenge if the average rural child is not being educated to support a modern, industrial society (State Council Research Office, 2006). For China to meet the educational needs of its labor force in the future, the only way to dramatically increase the share of the rural labor force with high school-level skills is to increase the level of promotion from junior high school to academic high school (or to dramatically improve the quality of more fundamental education in vocational high schools and other technical training programs).

The overall goal of this paper is to increase our understanding of the nation’s education system, especially at the high school level, at a time when China is facing challenges along its path of development. To meet this goal, we take the following steps. First, we provide a brief overview of the access of students to education in upper-level secondary schools (henceforth, academic high school) in China. Second, we develop an education production framework to help organize the discussion around what China’s major educational challenges are. Finally, we add empirical evidence about the high burden of tuition in poor rural areas of China by using a dataset that we recently collected from more than 1,000 students from Shaanxi Province, one of China’s poorest provinces.

There are limitations, however, in our approach. We focus chiefly on academic high schools (*putong gaozhong*), a fact that limits our ability to make conclusions about other segments of China’s post-junior high school education options, that is, either vocational high schools (*zhiye gaozhong*) or other post-junior educational institutions (e.g., adult high schools, or *chengren gaozhong*). We are aware of the fact that the international literature

documents the benefits of vocational training for contributing to social inclusion, poverty reduction, equipping learners with basic skills, and supporting personal development, e.g., UIS (2004), UIIEP (2006), Li (2007). We also understand that there has been a great expansion in vocational high school education in China in recent years; the government appears to be putting a lot of resources and effort into building up this segment of post-junior high education (State Council, 2005; Zhou, 2009). However, we do not include vocational education in this paper primarily for one reason: the general perception is that vocational schools are primarily operated to provide specific technical skills without emphasizing the teaching of basic educational skills, such as Chinese language, math, foreign language, and computer science, which will be in high demand in a modernizing economy (Xing, 2001). In other words, we are concerned about the content of courses offered in vocational schools, and many of them are doing little to build the basic academic skills of the rural labor force (Wan, 2007; Xinhuanet, 2009).

Access to High School Education in China

In this section our overall goal is to try to produce an estimate of the rate of enrollment of students into academic high school in a disaggregated way in order to better understand how many students (and from what part of the population, i.e., urban or rural China) are being promoted from junior high school to high school. The need to identify a number disaggregated into rural and urban is largely a result of the fact that if promotion rates (and/or enrollment rates) are different between rural and urban areas, the nature of the constraints keeping students from being promoted to academic high school and the policy prescription for overcoming the barriers are likely to be different.

The challenge in producing estimates of rates of promotion and/or rates of enrollment in rural and urban areas lies in the nature of China's education statistics. In fact,

statistics are reported and published in ways that make the disaggregation of promotion rates into rural and urban difficult to interpret at best and (unintentionally) misleading at worst. Therefore, one of the sub-objectives of this section will be to report the statistics that do exist, and explain why that interpretation needs to be carried out with care.

To meet the objectives of this section, we organize it as follows. First, we will report total (or aggregate—both urban plus rural) enrollment and promotion rates. In fact, it is possible to use statistics from secondary sources to provide a profile of educational access at the academic high school level in all of China (with both rural and urban students combined). Second, despite the known shortcomings, we will report the published statistics that do exist for rural and urban areas and discuss some of the problems of interpretation. Finally, we will present several sets of numbers from individual studies and specific provincial/county websites, seeking to provide what we believe is our best-guess estimate of the enrollment/promotion rates of rural students from junior high school to academic high school.

In this section we begin to work with two complementary indicators: the promotion rate from junior high school to academic high school and the academic high school gross enrollment rate. As discussed in the World Bank (2005), gross enrollment rate, as an access indicator, provides us with information about the *current efforts* being made by the government and citizens to provide and take advantage of opportunities to acquire a high school education. Conceptually, the same is true for the promotion rate. The promotion rate, however, necessarily differs from the gross enrollment rate in one fundamental way. Specifically, gross enrollment rate at the high school level is defined as the ratio of high school students to all high school-aged children (15-17 years old) in the population. In comparison, the promotion rate of junior high school graduates is defined as the ratio of total number of new entrants admitted to high schools to the total number of graduates of junior

high schools of the current year (MOE, 2007). Empirically, they may also differ because the sources of data may come from different sources and/or because there is a large degree of dropouts at the level of senior high school.¹

Access in the Aggregate

China has made significant progress in the expansion of access to high school education across the nation as a whole since the 1990s. Statistics from the Ministry of Education show that the *aggregate gross enrollment rate* at the academic high school level has more than tripled between 1990 and 2006, rising from 10.3 percent to 34.6 percent.² This means that by 2006 more than one-third of children in the relevant age cohort (15-17 years old) are participating in academic high school education in China.

The pattern of increased access to high school education also is found when we examine the data that seeks to measure the aggregate rates of promotion between junior high schools and academic senior high schools. Using statistics published in various years by the Ministry of Education, between 1990 and 2006, the proportion of junior high graduates that were admitted into academic high schools increased from 22.5 percent to 42.2 percent (Figure 1). As expected, aggregate promotion rates are higher than aggregate gross enrollment rates primarily because there are still students who do not finish senior high school.³ In other words, to reconcile the promotion and the enrollment data, it appears as if roughly 10 percent of students dropped out before graduation. While we will use this information later, we should not lose sight of an important part of the story: regardless of what the exact promotion/enrollment rate is, it is clear that more students in China are increasingly taking advantages of the opportunities of a high school education.

¹ Please note that the gross enrollment rate also is affected by students who start school late or are held back. This can lead to underestimates of aggregate enrollment for higher levels of schooling (and initial levels of schooling) and overestimates for intermediate levels of schooling.

² In the rest of the paper, when we use the term “aggregate,” we mean urban plus rural combined.

³ In fact, the two measures are closely associated. Results from a correlation exercise shows that the promotion rate and the rate of gross enrollment at the high school level are highly correlated. The correlation coefficient is 0.9135 and is significant at the 1 percent level.

Rural versus Urban

Despite the progress nationwide, access to high school education shows significant variation. Unfortunately, published statistical sources only provide information on aggregate enrollment rates and do not provide information on academic high school enrollment rates by urban and rural students. Therefore, we can only focus on the promotion rate between junior high school graduates and academic senior high schools.

According to official statistics published by the Ministry of Education, in 1990 45 percent of graduates from urban junior high schools were promoted into urban academic high schools. In contrast, during the same year only 7 percent of graduates from rural junior high schools were promoted to rural academic high schools (Figure 1). Moreover, according to the statistics-based reports, the gap has been widening since then. By 2006, while 70 percent of graduates from urban junior high school were promoted into urban academic high schools, only 9 percent of graduates from rural junior high went on to attend rural academic high schools. In other words, for the 16 years between 1990 and 2006, while the promotion rate of graduates from urban junior high schools in China increased by 25 percentage points, it increased by as little as 2 percentage points in its rural areas. According to these statistics, rural areas in China have fallen alarmingly behind urban areas in the access to academic high school education.

Nevertheless, using official statistics in this case is deceiving. The main problem is that every year there is a non-negligible number of rural junior high school graduates who go to non-rural academic high schools, making the promotion rate of 9 percent in rural areas too low. Likewise, because many rural students go to high school in urban areas, the promotion rate of students from China's urban areas (70 percent) also is relatively high.

If one cannot rely on published statistics, is it possible to generate an estimate of the rates of enrollment to high school by rural and urban? To do so, we start with what we do

know: aggregate gross enrollment rates in 2006 (34.6 percent) and aggregate promotion rates in 2006 (42.2 percent). We also know the population shares by rural and urban individuals in the 15 to 17 year-old cohort. According to China Population and Employment Statistical Yearbook (NBS, 2007b), 61 percent of China's 15 to 17 year olds are rural and 39 percent are urban. Using these parameters, we can then make a set of assumptions about the rate of promotion of urban students to academic high schools. Our best guess is 60 percent based on interviews of educational officials in a number of China's cities. However, we know this is guess, so we can also do sensitivity analysis and make the alternative assumptions that their guesses are either too high or too low (and in alternative scenarios assume the promotion rates of students in China's cities are either 70 percent or 50 percent). With these parameters (S_u =Share of population that is urban; S_r =Share of population that is rural; P_u =promotion rate of students from China's cities), we can then solve the following equation for the unknown (P_r)—the promotion rate of rural students:

$$\text{Aggregate Promotion Rate} = S_u * P_u + S_r * P_r,$$

or (after substituting for what we know and assume):

$$\text{Aggregate Promotion Rate (42.4\%)} = 0.39 * 60\% + 0.61 * P_r,$$

Using the urban promotion rate of 60 percent, we can see that this would imply a rural promotion rate of 31 percent. When using the alternative assumptions (that is: $P_u = 70\%$; or $P_u = 50\%$), the estimates for the promotion rates of rural students range from 25 percent to 37 percent.

In fact, the range of estimates using individual studies and specific provincial/county websites produce estimates that are roughly the same. Table 1 presents the findings of four provinces/counties that reported promotion rates. The promotion rates in the aggregate range from 28 percent to 47 percent. Unfortunately, as in the case of national statistics, none of the provinces/counties provide us with information that is disaggregated by rural and urban.

When doing the same calculations with the rural-urban numbers from these provinces/counties, it appears as if the rural promotion rates are in the range of 18 percent to 30 percent. Therefore, we would guess that, at most, only around 20 percent to 30 percent of junior high graduates in rural areas go on to attend academic high schools.

In sum, based on all of the statistical sources that we can find, and based on our most careful estimations, we find that access at the high school level, while rising, is still uneven across the nation. Moreover, it is clear that enrollment rates in academic high schools are quite low, especially among some of the rural segments of the population. In fact, China's record is behind that of Japan and South Korea during their take-off periods. While Japan and South Korea had enrollment rates in high school that were nearly 100 percent (OECD, 2007; Zhang & Zhang, 2008), China's gross enrollment rates are only around 40 percent. Those in rural areas are only around 25 percent. When thinking about this result, an important question naturally emerges: Why is access at the high school level so low in rural China?

Why Is Enrollment in High School so Low?

Two reasons have been proposed in the literature inside China (although mostly without empirical evidence) for the low rates of enrollment in high school in rural China. First, there is a barrier erected by the examination system. For students in China to be promoted from junior high school to high school, they need to take an entrance exam (which is called the *zhongkao*). The *zhongkao* is a competitive, standardized, prefecture-/city-wide exam that is given in the spring of the final year of junior high school. If students from rural China do not score high enough on the *zhongkao*, they are not allowed to enroll in academic high schools (e.g., Shaanxi Daily, 2006). According to Chen (2008b), even in the rural areas

of some coastal developed provinces (e.g., Guangdong), less than half of the junior high school students can test into senior high schools.

Second, in China today there are students from rural areas that have *zhongkao* scores that are high enough for entering academic high school that decide not to enroll.⁴ Due to a lack of published statistics, we know neither the exact number of such students, nor do we know their precise reasons for not attending high school. All the same, scholars are concerned with this phenomenon.⁵ Most likely students (and their parents) are doing some sort of cost-benefit analysis. When doing such calculations, there are a number of reasons why their final decision is not go to high school. One reason put forth is that students believe high schools are of such low quality that they will not benefit enough from enrollment (e.g., He, 2009). Li et al (2006) shows that (at least in the past) not all of those that get into high school will have a net positive benefit, especially those that are unable to enter college, since the cost of going to high school is too high (for the expected benefit).⁶

In order to examine why students would not go to high school when their *zhongkao* score was high enough to allow them to enroll, we find it useful to develop a conceptual supply-and-demand framework to clarify our thinking about a student's cost-benefit decision-making process. The conceptual framework developed for this study builds on the educational production function literature and focuses on the specification of the different factors involved in the input and output of the process that builds human capital in the high school environment. Internationally, there are a number of studies—e.g., Hanushek (1986),

⁴ When thinking about why the enrollment in high school in rural China is so low, one should not neglect the importance of supply-side constraints that are the result of strategic decisions made by the Ministry of Education. We believe this paper also has a message for the decision to expand high school enrollment—especially in rural areas. The number of academic high school slots available also is affected by the decision to promote vocational high school at the expense of academic high school. These issues are discussed in a number of local education bureaus, e.g., Wenzhou in Zhejiang province, and Xi'an in Shaanxi province (Wenzhounews, 2006; Sanqindailay, 2006).

⁵ There could be a social inefficiency if better students are not going to high school but rather are going to vocational school or not going to school at all. However, this relies on the unproven, but plausible, assumption that the relative social return to high school versus vocational school is greater for higher-ability students. There are also social fairness issues involved in high-ability students not attending high school because of liquidity constraints. These issues are important to consider in this paper, and we thank an anonymous reviewer for helping us to enunciate them.

⁶ High school tuition can affect enrollment in two different ways: if the cost is high enough, it could make the expected return negative; it also increases the likelihood of a binding liquidity constraint because more expenditures must be financed.

Figlio (1999), Dewey, Husted, and Kenny (2000), Alexander (2000), Fertig and Wright (2005), Bacolod and Tobias (2006), and Clotfelter et al (2007)—that have taken an education production function approach. Since we also are determined to understand the role of the cost of going to high school (or its price), which will affect the student’s willingness to enroll in high school, we need to extend the production function approach to include demand-side factors (by the student for high school education).

A close reading of the literature has shown that the production of educational output depends on factors that produce benefits (that is, the quality of the inputs) and the factors that determine the cost (that is, the cost of the education). For simplicity we assume that educational output is related to five groups of factors, which can be conceptually depicted as follows:

$$\text{Educational output}_{\text{high school}} = f(\text{school facility quality}_{\text{high school}}; \text{teacher quality}_{\text{high school}}; \text{curriculum quality}_{\text{high school}}; \text{quality of the students that enter high school}_{\text{pre-high school}}; \text{level of tuitions/fee})$$

where *educational output* is measured by the enrollment rate (or some other factor, such as, high school completion rates and/or standardized achievement test scores); *school quality_{high school}* represents the quality of the facilities of the school; *teacher quality_{high school}* represents the quality of the teaching staff; *curriculum quality_{high school}* represents quality of the material being taught; and *student quality_{pre-high school}* represents the quality of the students upon entering high school, which is related to factors such as the availability of nutrition and care of the student as they enter high school, as well as the quality of education that the students received in the years prior to the time that they entered high school. Of particular interest for this study, *tuition/fees* represent the amount of tuition/fees that each student must pay for each year of high school. Since in China there has been a large demand for unskilled labor in the past, most high school-aged individuals are able to find a job off the farm. Because of this,

an important component of the cost of education is the opportunity cost of attending high school, which should be considered as part of the cost of education.

According to this conceptual framework, there are four general reasons why many students from rural China would not go to high schools. First, the quality of high school facilities, high school teachers, and/or high school curriculum is so poor that the students would have no incentive to go; in other words, enrolling in high school would not expect to add any human capital. Second, even if the quality of high schools, high school teachers, and curriculum were good, it is possible (as discussed above) that the capabilities of students themselves are so low that they would not be able to meet the admission requirements (i.e., their *zhongkao* score would not be high enough). Third, it is possible that the cost of going to high school (tuition + fees + opportunity cost), given the perceived benefit, is too high. Finally, it also is possible that those in poor families perceive a high benefit, but they face a binding liquidity constraint.

While there certainly is still room for improving the facilities, teaching staffs, and curriculum in high schools, we do not believe that the quality of the facilities, the quality of the teachers, or the quality of the high school curriculum is the foremost reason for the current low rates of high school enrollment in rural China. Investment into facilities in high schools has soared in recent years. Between 1998 and 2006, the proportion of academic high schools that meet the minimum laboratory equipment standard increased from 63 percent to 82 percent. By 2006 64 percent of academic high schools had their campus websites built (MOE, 1999, 2007). Other indicators of quality—e.g., student/teaching staff ratio, a commonly used measure of school quality in the educational literature—shows that China performs well in international comparisons. More specifically, according to the MOE (2007),

the student/teaching staff ratio of academic high schools in rural China is 18.2, almost exactly the same as that in cities (17.2).⁷

The quality of teachers is also not one of the major constraints. It is true that while the quality of high school teachers in rural areas (as measured by the share that have a bachelor degree) is a bit lower than the quality of teachers in cities (76 percent in rural areas versus 93 percent in cities), internationally this is still high. In many countries, only a minority of high school teachers have gone to college (Cambodia Ministry of Education, Sport and Youth, 2008).

Finally, the curriculum in China's rural academic high schools also does not seem to be a problem, especially given the needs of the economy in the future. Whether studying in a rural or city academic high school, students are required to take the following ten subjects over three academic years: Chinese language, math, foreign language (English, in most schools), politics, history, geography, physics, chemistry, biology, and physical education. In 2003 the government issued a directive to reform the high school curriculum under the banner of quality education (MOE, 2003). In practice, this reform was aimed at including two more subjects: technology (e.g., computer science) and the arts (e.g., music, painting).

While the quality of the school facilities, teachers, and curriculum may not be a major factor in keeping enrollment rates low (in fact, because the quality is relatively high, we believe these factors stimulate the demand for education), we do believe that the quality of students (who are trying to make it into high school) is one reason that enrollment rates in high school are low in rural China. National educational data bases show that in rural areas many junior high school students do not score high enough on the *zhongkao* (MOE, 1999, 2007). In addition, according to existing surveys of even the top, fast-track junior high

⁷ The student/teaching staff ratio at the high school level in rural China is much lower than that in some developing countries. For example, according to OECD (2007), the student/teaching ratio in public high schools in Mexico is 30.2. In other words, relative to the rest of China or other developing countries, the quality of high schools in rural China should not be blamed for the low access and achievement at the high school level.

schools in poor rural counties, there are many students that do not even take the *zhongkao* since they do not intend to go to high school (which in most cases—as discovered in field interviews—is due to the fact that they do not believe that they will be able to pass the exam). Clearly, if we assume that the *zhongkao* is set at a level that establishes minimal degree of competency for incoming high school students, the academic quality of the students who are taking the exams is not high enough.

So what is the problem behind the poor quality of students from rural areas? By far, the biggest problem is the poor quality of education that rural children received at the elementary and junior high school levels (and/or the absence or poor quality of early childhood education). The quality of rural education in China is far lower than education in China's cities, where investment is higher (e.g., Wu, 2007); where the training of teachers is higher (e.g., Hu, 2008); and where the salaries of teachers and their working conditions are better (e.g., Tang, 2005). And, as can be expected, the poor nutrition and care received by rural children who are being raised by families with systematically lower incomes (during preschool and primary school years) make it difficult for rural children to participate and perform equally well in education prior to the time that they enter high school (Xu, 2001; Bao & Peng, 2005; REAP, 2008; Lu, 2008; Luo et al., 2009). For all of these reasons, the average quality of education for rural students is lower than their counterparts in China's cities.

Tuition/fees at the high school level: one of the greatest barriers

The last argument is that high school tuition/fees may constitute one of the greatest barriers for rural students to circumvent the quest to enter high school. Because the level of tuition is the center of a debate in China (e.g., Lu, 2006; Shen, 2006), and because tuition level is a policy that could be implemented relatively easily, high school tuition and fees are the focus of our discussion in this section of the paper. In examining the nature of China's

tuition and fees, we draw on two datasets that we recently collected. The first dataset is based on a survey of rural public high school tuition rates in 41 countries. This survey was done by contacting economists and educators that live and work in each of the 41 countries and asking them to provide information on the annual rate of tuition (only—no fees or other costs) of rural public high schools. For clarity, we call this the *Global Tuition Survey*. The other dataset (*Shaanxi High School Student Survey*) consisted of a sit-down survey filled out by more than 1,100 randomly selected high school students in 20 high school classes in eight poor rural counties in Shaanxi Province.⁸ The authors conducted the surveys themselves in June 2008, asking the students a number of questions about the cost of going to high school, how their parents financed high school and other information about their years in high school.

Based on the data from the Global Tuition Survey, there is persuasive evidence that, compared to global levels, China's tuition is extremely high (Figure 2). Our data show that a majority of countries (34 out of 41, or 80 percent) do not charge tuition in rural public high schools. In other words, in terms of formal tuition, *attending high school is free*. Even among the seven countries that do charge tuition, China appears to be an extreme outlier. In countries other than China that charge tuition, a public high school student pays \$1 (Bangladesh) to \$100 dollars (Mexico) per year. In contrast, a high school student in rural China has to pay as much as \$160 dollars a year as tuition (a number that is based on the Shaanxi High School Student Survey). In other words, the level of tuition that China's

⁸ The sampling strategy was designed to collect data on a random sample of high school students in Shaanxi. We first randomly selected eight poor counties that were chosen to represent four major areas of Shaanxi: Hengshan and Mizhi in Yulin prefecture, Yanchang and Yichuan in Yan'an prefecture, Zhashui and Danfeng in Shangluo prefecture, and Ziyang and Ningshan in Ankang prefecture. Yulin and Yan'an are located in the Loess Plateau in northern Shaanxi. Zhashui and Ankang are in the mountainous areas of southern Shaanxi.

The sample high schools were randomly then selected according to a random sampling procedure. In six counties, one senior high school was randomly selected from each county. In the other two counties (Hengshan in northern Shaanxi and Danfeng in southern Shaanxi—which were much larger in a population sense), two senior high schools were randomly selected from each county. Altogether we sampled 10 senior high schools. Within each senior high school, the survey team randomly chose two classes of grade two. All students in the sample classes make up a representative student sample, a total of 1,177 students.

students have to pay is significantly higher than the students in any other country we surveyed.

The tuition/fees barrier argument is further supported if one calculates high school tuition as a percentage of per capita income. When calculated in this way, China also is alarmingly ahead of other developing countries, including Mexico. For example, the amount paid by students and families to cover three years of public high school education in Mexico (the country with the second highest rate of tuition) accounts for only 4 percent of their per capita income (World Bank, 2008). In contrast, three years of high school tuition in rural China accounts for 82 percent of the net per capita income of rural people (NBS, 2008). For a rural family living at the poverty line, which has a net income of around \$100 dollars (in nominal terms), paying for three years of high school tuition (not including fees) is equivalent to almost five per capita incomes (China Youth Daily, 2009). In addition, Mexico has a national program that not only eliminates tuition for low-income families, it also provides payments to the families when they send their children to high school (Behrman, Parker, & Todd, 2007).

Our Shaanxi High School Student Survey shows that the extremely high level of tuition for public rural high schools in China is actually only part of the cost of going to high school. In addition to tuition, students and families have to pay the cost of textbooks, as well as room and board for the three years of high school, which is \$393 dollars a year (row 2, Table 2). In other words, the fees and other out-of-pocket expenses (assuming a student has to live in the school's boarding facilities—which is the case for almost all poorer rural students, who typically live far away from the site of the high school) are more than double the level of tuition. Moreover, this means the direct costs associated with a student getting three years of high school education in rural China amounts to \$1,659 dollars

[$=(160+393)*3$]. It is for this reason that it has been said that the full cost of sending a child to high school takes from 10 to 15 per capita incomes or more (Gansu Daily, 2007).

In addition, the out-of-pocket costs to the family are only a fraction of the full cost. Students and families also must incur the indirect costs of the foregone earnings that the student gives up during the three years of high school. According to the Ministry of Agriculture (MOA, 2008), if a junior high graduate enters into the workforce as an unskilled worker immediately after graduating from junior high rather than entering into an academic high school, he/she should expect to earn about \$1,685 US dollars a year. This, of course, means that the opportunity cost of three years of high school education per student would be \$5,055 dollars, a level that is more than three times the direct costs. When taking direct and indirect costs together, the total cost that students and families have to pay for three years of high school education in rural China amounts to \$6,714 dollars. Even for someone making the average rural per capita income, this amount would take more than twelve years to earn. It is equivalent to nearly 70 times per capita income for someone who was at the poverty line. In short, it is clear that high school tuition/fees impose a high burden on the families of students in poor rural areas of China.

Financing High School Education in Rural China

So how have the parents of the students from poor rural families financed such enormous expense related to their child's high education? There are two blocks of the Shaanxi High School Student Survey that allow us to provide some of the answers to this question. The first of these blocks asked each student to fill out a check list of the sources that his/her parents used to finance high school tuition and other related expenditures. The checklist included 11 choices: savings of parents; savings of siblings; earnings by students

themselves from casual labor; loans from friends, relatives or fellow villagers; loans from money lenders; bank loans; selling family assets; merit-based scholarships; needs-based grants; gift money from friends, relatives or fellow villagers; and donations. In another block of the survey, we asked students a series of questions about the financial aid availability in their high school years (e.g., questions such as, whether they applied for financial aid and how much financial aid they actually received).

Our data show that many parents of families from poor rural areas appear to face liquidity constraints in financing their children's high school education. In order to finance their children's high school education, almost all parents have to draw on their own savings (Table 3, row 1). For many parents, however, their own savings only provides part of the financing. In fact, our survey results show that approximately one-third of the parents of high school students actually go into debt to finance their child's education. Our data show that parents borrow from family members, friends/neighbors and fellow villagers (row 4). In addition, the survey even found that some families had to liquidate household assets (row 7). Many parents also tell us that even though they are 40 years old or older, they have to return to the migrant labor force (often working in unskilled jobs such as mining or construction) to earn enough to pay for their child's high school.

What has been the government response to this problem? The answer is: "not much." According to our survey results, while almost 30 percent of students at the high school level applied for financial aid in rural China, only a minority of students (8.1 percent) are receiving any financial aid (Panel A, Figure 3). And, recall these answers are from students from an area that is quite poor. Moreover, even when receiving financial aid, it often does not amount to much. Despite the fact that the annual tuition plus fees per student for high school in rural China amounts to more than \$500 US dollars, the size of financial aid on a per student basis (conditional on receiving financial aid) is negligibly small, only \$6 US dollars

per student per year—between 1 percent to 2 percent of the total costs (Panel B). In other words, although it costs a lot to attend high school in rural China, there is little financial aid available at the high school level—at least in the poor rural counties of Shaanxi Province.

Summary and Conclusions

At this stage of its development path, China is facing a real challenge. As wages are rising, the nation's economy needs to become increasingly competitive in quasi-skilled and skilled industrial sectors so that up-scale factories can be induced to establishing themselves in China (or emerge from investment by domestic entrepreneurs). Since rural China will be providing a large share of the labor force in the coming years to staff China's factories and service enterprises, one of the keys for China to staying competitive is to having the average rural child be educated to a degree (at least to the level of high school, specifically) that is needed to support a modern, industrial society.

However, our results indicate that access to a high school education is still limited—especially in poorer areas of rural China. According to our analysis, only 20 percent to 30 percent of junior high graduates in rural areas go on to attend academic high schools. In contrast, more than 80 percent of junior high school graduates in China's large cities matriculate into academic high schools. The share of the labor force with a high school education—**the minimum level of education that will provide the individual with many of the math, computer, Chinese language and English skills that will be needed/required in most modern work places in the future. Clearly, there is something that is keeping children in poorer rural areas out of high school.**

According to our analysis, the low access to high school in rural China may be in no small part a problem of the level of tuition and fees in high schools. Certainly, there are other problems, such as the poor quality of education prior to high school, yet our comparative

analysis of the levels of tuition in public rural high school in more than 40 developing and developed countries shows that the level of tuition China's students are required to pay is far higher than in any other country that we surveyed. Unsurprisingly, our data—from a representative survey of high school students in Shaanxi, one of China's poorest provinces—also show that not only is financing high school an enormous burden for the families of poor students, there is little financial aid available. Clearly, while there are other problems, the high rates of tuition (and fees)—which sometimes reach more than 10 times per capita income of those at the poverty line (and higher when considering the opportunity costs)—constitutes one of the greatest barriers to high school education in rural China. This barrier does not appear to be coming down any time soon, even though China is experiencing a time greater challenges in improving its industrial structure as the nation continues along its development path.

Based on the results, it is reasonable to conclude that since the high rates of tuition (and fees) constitute one of the greatest barriers to high school education in rural China, policy makers in China need to take steps to eliminate the barrier. We believe that China has the resources to eliminate tuition and fees all over China.⁹ Even if China is not ready to eliminate tuition at the high school level nationwide, policy makers should consider a program like the PROGRESA in Mexico, which provides free tuition at the high school level for the poor, and even provides the poor with payments for sending their kids to high school. We believe that China should be trying to promote high school enrollment like Mexico. China's future depends on improving enrollment in high school. Eliminating tuition for those that have difficulty paying such high levels of tuition is one concrete step it can take to move in that direction.

⁹ We realize in making this suggestion that the final decision is a complicated one. There is clearly a set of issues that have to be internally consistent before undertaking the decision to making any new level of education compulsory and/or free. We should also keep in mind that the public provision of education does not really make it free, since the extra costs must in the end be financed by government taxation. Reducing or eliminating tuition for students, however, does affect the private costs of education and social equity.

In fact, we also believe that China has the financial resources to move beyond just rural areas. Top leaders at the 17th National Congress of the Communist Party of China in 2007 began to move in the direction of reducing high school tuition. If China would eliminate tuition, education officials would not be taking a radical step; they would be making high school education free—as it is in most of the rest of the world.

References

- Alexander, N. (2000). The Missing Link: an Econometric Analysis on the Impact of Curriculum Standards on Student Achievement. *Economics of Education Review*, 19, 351–361.
- Bacolod, M., & Tobias, J. (2006). Schools, School Quality and Achievement Growth: Evidence from the Philippines. *Economics of Education Review*, 25, 619–632.
- Bao, N., & Peng, D. (2005). Chengxiang Putong Gaozhong Ruxuelv Chayi de Jingjixue Fenxi (Economic Analysis of the Rural-Urban Inequality in Gross Enrollment at the High School Level), *Keji Chuangye Yuekan* (Pioneering with Science and Technology Monthly), 7.
- Behrman, J.R., Parker, S.W., & Todd, P. E. (2007). Do School Subsidy Programs Generate Lasting Benefits? A Five-Year Follow-Up of Oportunidades Participants. Mimeo, University of Pennsylvania.
- Bernanke, B. S. (2007). Education and Economic Competitiveness, A Speech at At the U.S. Chamber Education and Workforce Summit, Washington, D.C. September 24, 2007. <http://www.federalreserve.gov/newsevents/speech/bernanke20070924a.htm>. Last time accessed, February 19, 2009.
- Brandt, L., Rawski, T., & Sutton, J. (2008). Industrial Development in China. In L. Brandt & T. G. Rawski (Eds.) *China's Great Economic Transformation* (pp 1–906). New York: Cambridge University Press.
- Cambodia Ministry of Education, Youth and Sports. (2008). *Education Indicators 2007/2008*. Phnom Penh: MEYS.
- Chen, B. (2008a). Waiqi Chezi Bushi Huaishi (It is not a bad thing that foreign companies shift their investment out of China). *Shuzi Shangye Shidai* (Digit Business Times), Feb 19, 2008. <http://www.digitimes.com.cn/digitimes/zl/174528.shtml>. Last time accessed, February 19, 2009.
- Chen, L., & Su, H. (2008). Waishang Zhijie Chezi Dui Woguo Chanye Shengji de Yingxiang (The Impact of Foreign Companies Shifting their Investment out of China on China's Industrial Upgrading). *Guoji Maoyi* (International Trade), 6, 120-121.
- Chen, S. (2008b). Guanyu Jjingji Qianfada Diqu Gaozhong Jiaoyu de Sikao---Yi Haifeng Weili (A Note on High School Education in Under-developed Regions: Evidence from Haifeng County), *Heilongjiang Keji Xinxu* (Heilongjiang Science and Technology Information), 164-165.
- China Youth Daily. (2009). Zhongguo Pinkunxian yu Guojibiaozhun Chaju Xuanshu (Gap between China's Poverty Line and International Standard), China Youth Daily, April 9, 2009.
- Clotfelter, C., Ladd, H., & Vigdor, J. (2007). Teacher Credentials and Student Achievement: Longitudinal Analysis with Student Fixed Effects. *Economics of Education Review*, 26, 673–682.
- Dewey, J., Husted, T., & Kenny, L. (2000). The Ineffectiveness of School Inputs: a Product of Misspecification? *Economics of Education Review*, 19, 27–45.
- Fertig, M., & Wright, R. (2005). School Quality, Educational Attainment and Aggregation Bias. *Economics Letters*, 88, 109–114.

- Figlio, D. (1999). Functional Form and the Estimated Effects of School Resources. *Economics of Education Review*, 18, 241–252.
- Gansu Daily (2007). Guojia Zhuxue Biewangle Gaozhong Pinkunsheng (Poor High School Students should not be ignored by the State Financial Aid for Education). <http://edu.gansudaily.com.cn/system/2007/07/05/010402176.shtml>, last time accessed, April 2, 2009.
- Hanushek, E. (1986). The Economics of Schooling: Production and Efficiency in Public Schools. *Journal of Economic Literature*, 24(3), 1141-1177.
- He, Y. (2009). Weishenme Shangdaxue de Nongcun Haizi Shaole (Why so few rural students go to college?) <http://focus.cnhubei.com/original/200903/t604450.shtml>, last time accessed, April 9, 2009.
- Holz, C. A. (2008). China's Economic Growth 1978-2025: What We Know Today about China's Economic Growth Tomorrow. *World Development*, 36(10), 1665-1691.
- Hu, Y. (2008). A Historical Analysis of and Strategies for the Problem of Ensuring Teachers in Rural Education. *Journal of Educational Studies*, Feb, 4(1): 83-90.
- Li, H., Liu, W., Ma, N., & Zhang, J. (2006). Does Education Pay in Urban China? Estimating Returns to Education Using Twins. Discussion Papers, Chinese University of Hong Kong, Department of Economics.
- Li, Q. (2007). Shi Lun Woguo Zhiye Jiaoyu Fazhan de Pingjing he Duice (Technical and Vocational Education and Training in China: Bottlenecks and Countermeasures), *Fujian Taoyan*, 3, 19-23
- Lu, J. (2006). Gaozhong Xuefei Zhengce de Bijiao Yanjiu (A Comparative Study of High School Tuition), *Shanghai Jiaoyu Keyan* (Shanghai Education Research), 9, 4-8.
- Lu, M. (2008). Gaishan Nongcun Jisuzhi Xuexiao Ertong Yingyang Xiangmu de Youlai he Chengxiao (Improving the Nutritional Status of Boarding Elementary School Students in Rural China), Project brief No. 51, China Development Research Foundation, Beijing, China.
- Luo, R., Zhao, Q., He, M., Liu, C., & Zhang, L. (2009). The Empirical Analysis of Early Childhood Education of Poor Rural China. *Studies in Preschool Education*, 1, 7-10.
- Ministry of Agriculture (2008). Nongmin Yuejun Gongzi Shouci Tupo Qianyuan (Migrant Worker's Monthly Wage Rate Surpasses 1000 Yuan for the First Time). *People's Daily* (Overseas), August 29, 2008.
- Ministry of Education (2003). Jiaoyubu Guanyu Yinfa Putong Gaozhong Kecheng Gaige Fang'an he Yuwen Deng Shiwu Ge Xueke Biaozhun (Shiyan) de Tongzhi (A Directive about Curriculum Reform in at the Academic High School Level (pilot) and Curriculum Standards for 15 Subject Areas), Jiaoji [2003]#6, Beijing, China.
- Ministry of Education (1999). *Educational Statistics Yearbook of China*. Beijing: People's Education Press.
- Ministry of Education (2007). *Educational Statistics Yearbook of China*. Beijing: People's Education Press.
- National Bureau of Statistics. (2007a). *China Statistical Yearbook*. Beijing: China Statistics Press.

- National Bureau of Statistics. (2007b). *China Population and Employment Statistical Yearbook*. Beijing: China Statistics Press.
- National Bureau of Statistics. (2008). *China Statistical Yearbook*. Beijing: China Statistics Press.
- OECD. (2007). *Education at a Glance: OECD Indicators 2007*. Paris, France.
- Park, A., Cai, F., & Du, Y. (2007). Can China Meet Her Employment Challenges? Paper prepared for the conference on Growing Pains: Tensions and Opportunity in China's Transformation, Stanford University, November 1-3, 2007.
- Rural Education Action Project. (2008). Nongcun Jisuzhi Xiaoxue de Xianzhuang ji dui Dizheng hou Xiaoxue Huifu Chongjian de Qishi (Boarding Schools in Rural China: Current Status and Implications for School Reconstruction in a Post-5.12 Earthquake Era), *Renmin Zhengxiebao Jiaoyu Zaixian* (Education Online---CPPCC), June 4, 2008, Pages C2-C3.
- Sanqindaily. (2006). Xi'an Jinnian Zhigao he Zonghe Gaozhong Jiang Kuozhao (Xi'an Sees Expansion in New Enrants into Vocational High School and Comprehensive High School), *Sanqindaily*, September 5, 2006, Xi'an, Shaanxi, China.
- Shaanxi Daily. (2006). Nongcun Chuzhongsheng Jin Gaozhong Weihe Zheban Nan (How Come it is So Difficult for Junior High Graduates from Rural Areas to Go to High School?), *Shaanxi Daily*, October 17, 2006, Xi'an, Shaanxi, China.
- Shen, B. (2006). Woguo Putong Gaozhong Xuefei de Diqu Chayi Fenxi (Regional Variation in Tuition at the Academic High School Level in China), *Dangdai Jiaoyu Luntan* (Forum on Contemporary Education), 10.
- State Council Research Office. (2006). *Zhongguo Nongmingong Diaoyan Baogao* (A Survey Report on Migrant Workers in China). Beijing: Zhongguo Yanshi Chubanshe (China Yanshi Press).
- State Council. (2005). Guowuyuan Guanyu Dali Fazhan Zhiye Jiaoyu de Jueding (A Decision to Promote the Development of Vocational Education in China), *Guofa* (2005) No. 35.
- Tang, Y. (2005). Nongcun Jiaoshi Duiwu Jianshe zhong de Wenti yu Duice Sikao (Teachers at the Basic Education Level in Rural China: Issues and Reflections), *Xueshu Luntan* (Academic Forum), 3, 175-178.
- UNESCO International Institute for Educational Planning. (2004). *Promoting Skills Development*. Report of an Interregional Seminar, Paris, 22-23 January 2004, France.
- UNESCO Institute for Statistics. (2006). *Participation in Formal Technical and Vocational Education and Training Programs Worldwide: An Initial Statistical Study*. Quebec, Canada.
- Wan, P. (2007). Gaozhi Zhiyegangwei Xing Shixun Jidi Jianshe de Gouxiang (A concept to build up training centers for vocational education), *Zhiye Jiaoyu Yanjiu* (Vocational Education Research), 7, 18-19.
- Wenzhounews. (2006). Shijiaoyuju: Jinnian Putao Buzai Kuozhao, Zhigao Bili Shangsheng (The City Education Bureau Says No Expansion in the New Enrants into Academic High School, More Slots Allocated to Vocational High Schools), *Wenzhounews*, April 5, 2006, Wenzhou, Zhejiang, China.

- http://www.chinaedunet.com/news/zyjsjy/2006/4/content_38162.shtml. last time accessed, July 27, 2009.
- World Bank (2005). *Expanding Opportunities and Building Competencies for Young People: A New Agenda for Secondary Education*. Washington DC, USA.
- World Bank. (2008). Mexico Country Brief, <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/LACEXT/MEXICOEXTN/0,,menuPK:338407~pagePK:141132~piPK:141107~theSitePK:338397,00.html>. Last time accessed, January 10, 2009.
- Wu, C. (2007). The Study on the Evolvement and Determinants of Urban-Rural Fiscal Expenditure Gap of Compulsory Education in China, *Education Science*, 23(6): 1-5.
- Xing, H. (2001). On the Relationship between Senior Middle Schools and Secondary Vocational Schools and the Tactics for their Coordination and Development, *Journal of Hebei University (Educational Science)*, 3(4), 78-84.
- Xinhuanet. (2009). Zhu Yong Daibiao: Zhiye Jiaoyu Buneng “Heibanshang Kai Jiqi” (Representative Zhu Yong said: vocational education shouldn’t be operating machines on blackboard) <http://job.worker.cn/contentfile/2009/03/09/172319604621006.html>. Last time accessed, February 19, 2009.
- Xu, J. (2001). Lun Xueqian Jiaoyu (A Note on Preschool Education), *Qiushi Zazhi (Qiushi Journal)*, 23.
- Xu, K., & He, Y. (2008). 2008 Nian Zhongxiao Qiye Daobi Chao: Zhongguo Jingji Zengzhang Moshi Zhuanbian de Xuyao he Biran (Thousands of Small-Medium Enterprises Closed Down, Necessary and Inevitable in China’s Context of Changing Transforming Economic Growth.) *Fazhi yu Shehui (Legal System and Society)*, 11.
- Zhang, R., & Zhang, T. (2008). Jingji Zengzhang he Shouru Chaju Suoxiao Heyi Jiande (Economic Growth and Narrow-down of Income Gap, How to have both in the mean time), *Jingji Xuejia*, 5.
- Zhou, J. (2009). Yi Kexue Fazhanguan wei Zhidao Shixian Zhongdeng Zhiye Jiaoyu Youkuai Youhao Fazhan (Fostering the Development of Secondary Vocational Training with a Scientific Outlook on Development), <http://www.moe.edu.cn/edoas/website18/level3.jsp?tablename=2038&infoid=1236819429882350>, last time accessed, April 7, 2009.
- Zi, D., Xu, Y. (2006). Kuagong Gongsu Chezi de Shizheng Yanjiu (An Empirical Research on Withdrawal of Investment by Multinational Corporations), *Tongji Yanjiu (Statistical Research)*, 2.

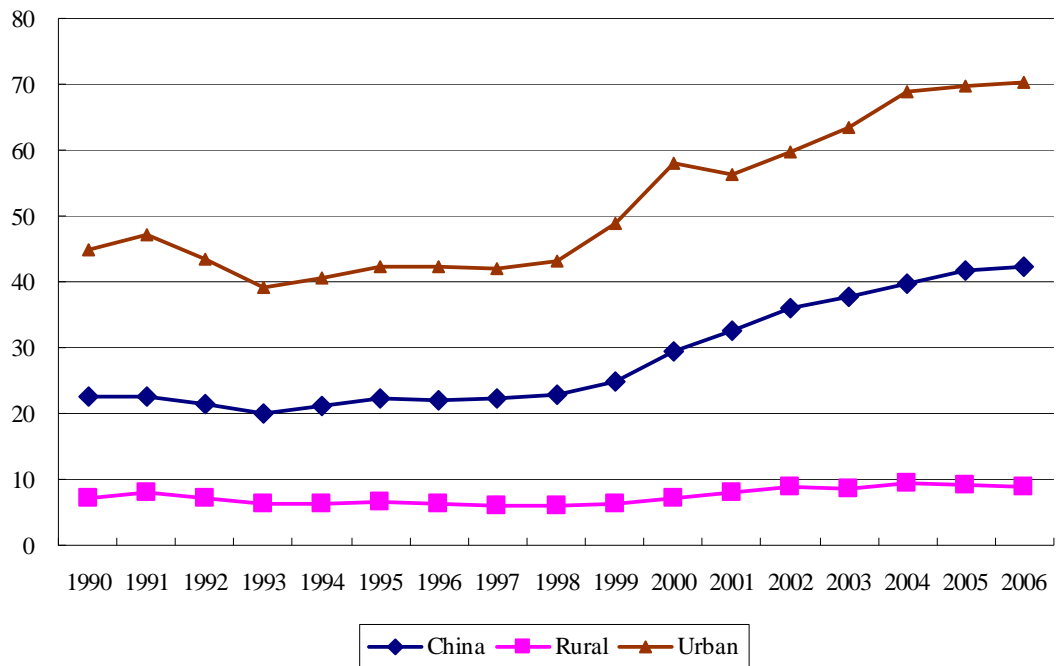


Figure 1. Promotion Rate between Academic Junior High School to Academic High School, by region, 1990-2006
 Source: calculated by authors from China Statistical Yearbook (various years).

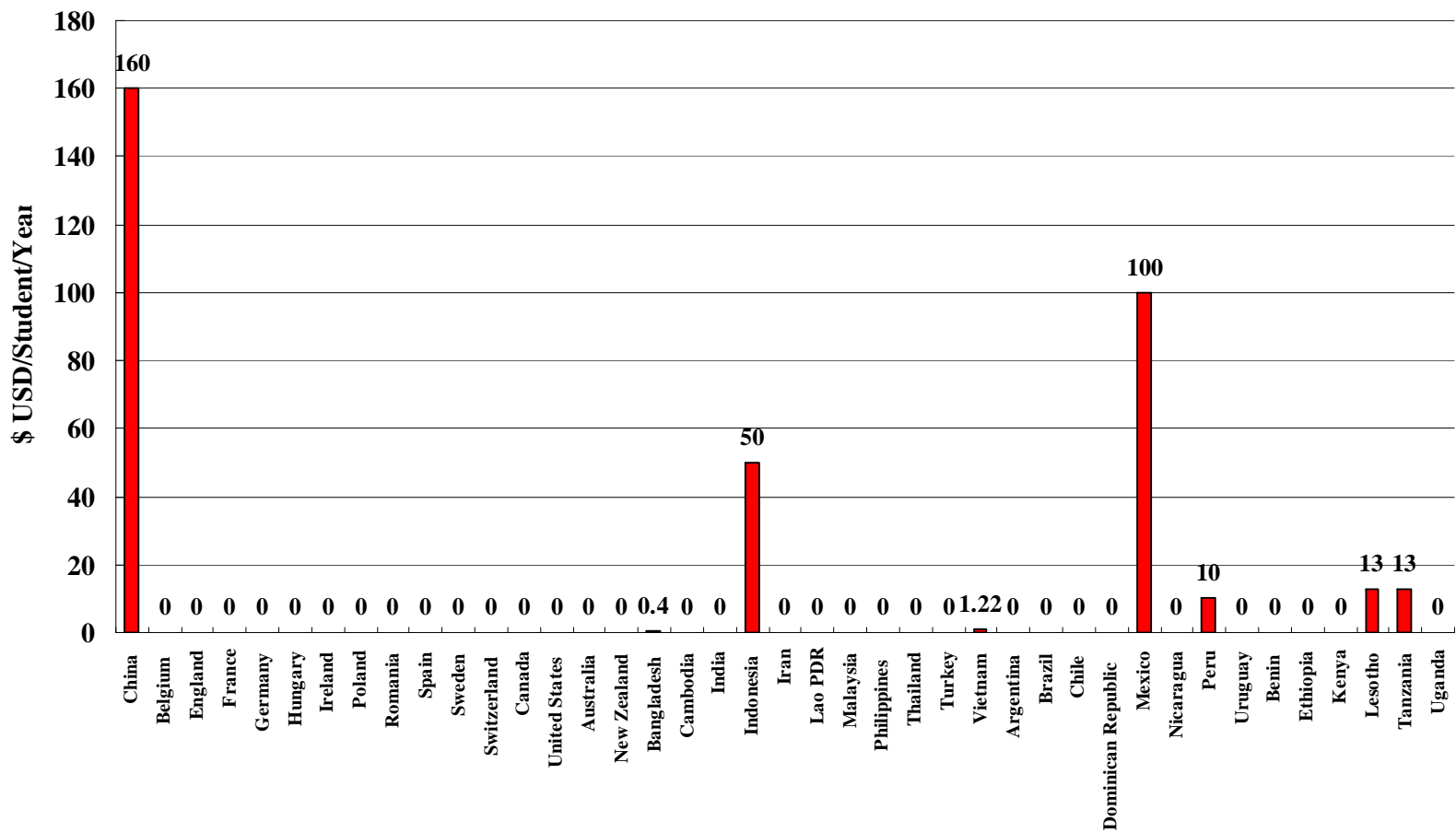


Figure 2. Annual Tuition Per Student in Public High Schools
 Source: Authors' survey.

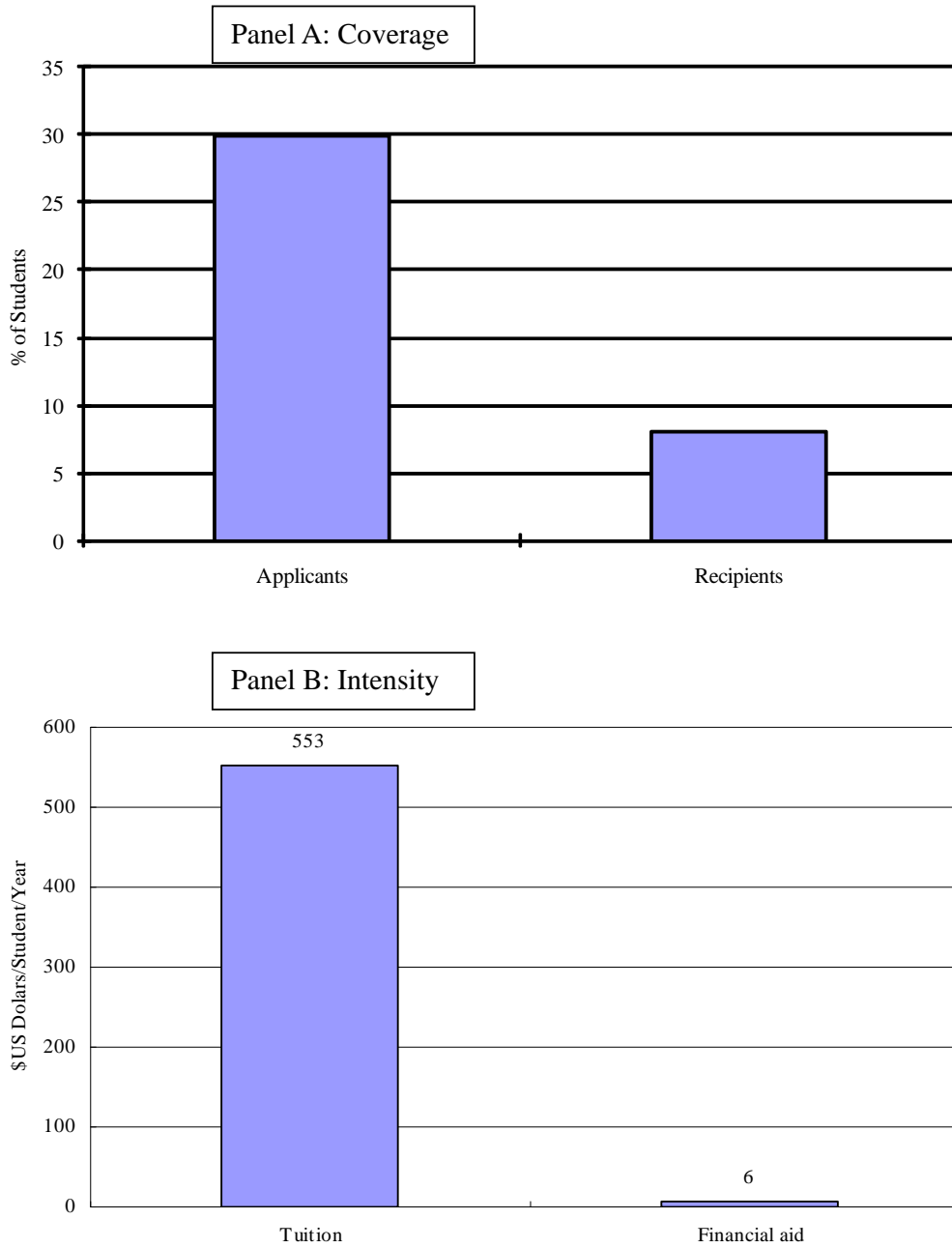


Figure 3. Availability of Financial Aid at the High School Level in Rural China
 Source: Authors' survey.

Table 1. Examples of Published Aggregate Promotion Rate from Junior High School to Academic High School

Promotion rate (%)	Reference year	Reference site	Source
32	2002	Guangdong	http://www.ycwb.com/gb/content/2004-07/21/content_727547.htm
47.1	2003	Heilongjiang	http://heilongjiang.northeast.cn/system/2003/07/24/013010039.shtml
30	2003	Shanyang, Shaanxi	http://www.sxdaily.com.cn/data/kjxw/01/20030828_8730208_0.htm
28.1	2007	Ziyang, Shaanxi	http://www.zyrd.gov.cn/Article/xzrd/200811/87.html
38	2008	Bayan, Heilongjiang	http://dzh.mop.com/topic/readSub_8901531_0_0.html

Table 2. High School Education Expenditure Required of Students and their Families

Items	Expenditure (\$ US Dollars/Student/Year)
1). Tuition	160
2). Non-tuition expenditure	393
Textbooks	58
Dorm	44
Food	171
Transportation	18
Tutoring	37
Miscellaneous fees	65
Total	553

Source: authors' survey.

Table 2. Funding Sources for High School Education of Students from China's Poor Rural Areas

Funding sources	% of students who use this source
<i>Savings, earnings by family members</i>	98.3
1). Parents' savings	
2). Siblings' savings	19.5
3). Earnings by student him/herself from casual labor	8.9
<i>Credit/loan</i>	
4). Borrow from friends, relatives, fellow villagers	32.9
5). Borrow from money lenders	8.0
6). Bank loan	0.3
7). Family asset liquidation	14.0
<i>Financial aid</i>	
8). Merit-based scholarship	5.6
9). Needs-based grant	5.1
<i>Other sources</i>	
10). Gift money from friends, relatives, fellow villagers	10.7
11). Donations	3.4

Source: Authors' survey.