

# **Migrant schools and the education of migrant children in China: learning versus institutional barriers**

Preliminary Draft

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## **Abstract**

The qualities of these private-operated migrant schools are much worse than the general public schools and local governments have tried to improve their quality recently. This paper examines the change of the qualities of these private migrant schools, using two wave panel survey data and standardized test scores from field work conducted in Shanghai. We find that migrant students in migrant schools perform significantly worse than their counterparts in public schools, but the gap has decreased recently. The progress of the migrant schools cannot be contributed to increase effort of migrant students or parent in migrant schools. However, on the other hand, the institutional barrier still remains. Students graduated from migrant private schools are less likely to attend middle schools in Shanghai and the parental satisfaction differentials between the two school types remain unchanged.

**Key words:** Education of migrant children; migrant school; standardized test score

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## Introduction

One of the main drivers of China's phenomenal economic growth during the past three decades has been the large-scale and persistent rural-to-urban migration. As a consequence, a half of China's 1.3 billion people now live in cities, as compared to only twenty percent in the early 1980s. Nevertheless, researchers have expressed concerns over China's so called "pseudo-urbanization" (see e.g. Henderson, 2009 and Yew, 2012). The majority of rural migrants in cities do not possess a local household registration (HuKou), thus are excluded from full access to pension, health care, public education and other social benefits at the place they live. Based on the 2010 Census, there are about 220 million such "non-HuKou" migrants in Chinese cities.

Among all non-Hukou migrants, it is estimated that over 20 million are children aged between 6 and 14. Although all Chinese school-age children are entitled to a free and compulsory 9-year education by law, the Chinese educational system designates elementary education to local governments at the county/district level. Funding for elementary education is allocated by the number of children with HuKou and not portable across administrative units. Therefore, local authorities lack the incentives and financial resources to accommodate the educational needs of migrant children. A significant proportion of migrant children is thus excluded from the public education system and has to enter the so called "migrant schools".

Migrant schools started in the early 1990s as a market-based response to the educational needs of migrant children. Since its inception, migrant school flourished quickly, and by the early 2000s they played a more important role in admitting migrant children in many cities than public schools. For migrant parents, the fees charged by migrant schools are far more affordable than those necessary to enroll their children in a public school. Migrant schools are typically established by migrant entrepreneurs, are for-profit, and offer inferior conditions. Migrant schools were also subject to constant closures and changes of places as they do not have a clear legal standing within China's educational system (Han, 2004). In recent years, the conditions in many migrant schools have improved substantially, thanks to donations from the society and in some cases subsidies from the local government. Still, migrant schools and their students are "not-in-the-system" as compared to public schools, in some places even illegal.

In this paper, we seek to understand the consequences of such discriminating policies using panel data collected in Shanghai in 2010 and 2012. In the fall of 2010, we have selected 20 elementary schools in Shanghai (including 9 migrant schools and 11 public schools) and surveyed all 4th grade students from these schools. We did the second wave survey to the same schools and the same students in the spring of 2012. In both waves, we collected information on schools, classes, students and parents through survey questionnaires, and also administered standardized tests which allow us to compare academic performance of students in both

types of schools.

Overall, we find that students in migrant schools perform considerably worse than their counterparts in public schools. However, the test score gap in mathematics has almost halved between 2010 and 2012. Similarly, the gap in terms of parental subjective evaluation of school quality has also declined, suggesting a relative improvement of the quality of migrant schools, which can be attributed to increased funding assistance and monitoring from the government. Nevertheless, significant disparities remain in terms of parental overall satisfaction. Students graduated from migrant schools are also much less likely to have the opportunity to continue their middle school education in Shanghai, irrespective of their academic performance. Our results suggest that in addition to efforts to improve learning within migrant schools, it is also essential to remove institutional barriers that give migrant students unequal opportunities in the current educational system.

The rest of the paper goes like follows. Section 3 describes of the data source and the empirical methodology. Section 3 presents the main result on the change of relative quality between migrant schools and public schools. In Section 4, we will explore for possible reasons for the change of the quality of migrant schools. Section 5, on the other hand, will analysis the remaining institutional barriers for migrant schools. Section 6 concludes.

## **2 Data and Methodology**

### **2.1 Description of the Data**

Data for this study were collected from 20 elementary schools in Shanghai in November 2010 and June 2012. In the first wave, all fourth grade students from 11 public schools and 9 migrant schools were interviewed and given standardized tests on Mathematics. Because the municipality government has shut down all migrant schools in the central districts of Shanghai, all 9 migrant schools were from the peripheral districts. On the other hand, 5 public schools were from the central districts and the rest were from the peripheral districts. All public schools we selected admitted a significant number of migrant students, with the percentage of non-HuKou students ranging from 27 percent to 83 percent. We therefore excluded those elite schools where competition in terms of enrollment is fierce even for students with Shanghai HuKou. In each school, we choose all students in the fourth grade as our sample in the first wave. Each school has between 2 to 6 classes in the fourth grade. Class size ranges from 18 to 59 students. In all, we have around 2500 students. In the second wave in June 2012, we survey the same schools and give additional IQ tests. Our sample students were in the fifth grade and most of them already know about their choice of middle schools. For a

follow up check, we made telephone call to all student parents in October 2012 and asked about the students' middle school information. Thanks to the cooperation from school administrators and parent cooperation, our response rate of school survey is close to 100% and response rate of follow-up parent telephone survey is close to 85%.

We collect information at the school, class, student and parent level through the following: 1) a school survey completed by a school administrator; 2) a class survey completed by the master teacher; 3) a student survey completed by students in class under the instruction of our surveyors; 4) a student information sheet completed by the master teacher; and 5) a parent survey completed by parents. The school survey collects basic information about the school, such as its history, number of classes and students, basic characteristics of all teachers, sources of funding, enrollment requirements for students without Shanghai *HuKou*, fees, and so on. The class survey asks questions about the whole class, such as its curriculum, educational background and teaching experiences of course instructors. The student survey asks the students questions such as their prior history of school transfer, time use after school, whether parents have helped them with study after school, and their personal feelings about going to school, etc. The student information sheet collects basic information about each student in a class, such as their *HuKou* status, gender, age, height and weight, disability status, class performance evaluated by the master teacher. Lastly, the parent survey collects information about parents, including their age, education and income, migration history, expectations on their children's education, parental assessment of school quality, and overall satisfaction with the current school, among other things. Students are instructed to give the parent survey questionnaires to their parents to complete, and bring back the questionnaires on the next school day. In case of unfilled questions, our interviewers would work with the master teacher to resolve the issue, and check by telephone with parents directly if necessary.<sup>3</sup>

We give the same standardized Mathematics tests to all students in both public schools and migrant schools. Because migrant schools are considered as only "informal" schools and not part of the local educational system, the education bureaus do not give standardized tests to students in migrant schools. The school self-administered tests also do not reflect the true performance gap between migrant schools and public schools. Actually, because migrant schools are private schools and face competition in terms of student enrollment, many are reported to give inflated scores to their students<sup>4</sup>. Our Mathematics tests are designed by experts outside the sample schools, and incorporate different curriculum requirements by Shanghai and other provinces. Test time for each subject is 20 minutes, proctored by both the master teacher of the class

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<sup>3</sup> All questionnaires are available from the corresponding author upon request.

<sup>4</sup> See e.g. Chinese web link at <http://news.sina.com.cn/c/sd/2011-12-31/101123730122.shtml>.

and one of our interviewers.

## 2.2 Empirical methodology

In our empirical work, we use the difference-in-difference model:

$$Y_{it} = \beta_0 + \beta_1 M_i + \beta_2 M_i * Wave2 + \beta_3 Wave2 + IQ\beta_4 + X'_{it}\beta_5 + X'_{it} * Wave2\beta_6 + \varepsilon_{it} \quad (1)$$

Where  $Y_i$  is the education outcome variable that we are interested in. In this paper, we consider three different outcomes, including standardized test scores, parental overall satisfaction, and parental assessment of the school quality.  $M_i$  is a dummy variable for the type of school, which equals to 1 if student  $i$  is enrolled in a migrant school, 0 if in a public school.  $Wave2$  is a dummy variable for the second wave in 2012.  $X_i$  is a vector of control variables including student and parental characteristics, such as age, gender of the student, parental education and family income. To minimize selection bias between the two school types, we also use the student IQ test scores as control variable.  $\varepsilon_i$  is the error term which includes all other factors that also affect the educational outcome. In our empirical work, we cluster the error term at the class level to capture within-class correlations in  $\varepsilon_i$ .

When the test score is used as the outcome variable, the coefficient  $\beta_1$  corresponds to the test score gain in the first wave in 2010 if a migrant student is reassigned to a public school, holding everything else unchanged. The coefficient  $\beta_3$  represents the change of the gap between schools types from 2010 to 2012. Both of them capture the overall test score difference between migrant schools and public schools and reflect effects of various factors both at the school level, such as the quality of school administrators and school infrastructures, and at the class level, such as the qualities of teachers and classmates. This paper does not try to disentangle these effects for the following reasons. First, from the viewpoint of identification, it would be difficult to separate those effects given that the variations between public schools and migrant schools far outweigh the variations within public or migrant schools. In another word, migrant schools are much worse than public schools virtually in all observed dimensions, thus it would be difficult to attribute the overall test score gap to any specific factors. Second, there might be important interacting effects between school type and various factors at the school and class levels. Third, it is well-known in the education literature that many important determinants of education quality are difficult to observe or measure for outside researchers. For example, Rivkin et al. (2005) provides evidence that teacher quality is important in explaining variations in test scores, despite that observed teacher characteristics such as education and teaching experience have little explanatory power.

## 3 Empirical Results

### 3.1: Summary Statistics

Table 1 lists summary statistics on test scores in both waves and some key characteristics of students and their families, by three groups separately: students with Shanghai *HuKou* (Shanghai students) in public schools, students without Shanghai *HuKou* (migrant students) in public schools, and migrant students in migrant schools. Among the three groups, Shanghai students have the highest average test scores in Mathematics. Within public schools, Shanghai students, on average, score around 1-3 points higher than migrant students. However, these differences are much less pronounced compared to the differences between migrant students in and out of public schools. The score gap in Mathematics is 15.6 points in the first wave, but this gap decreased to 10.8 in the second wave. To make the test score between two waves comparable, we standardized the test scores by setting the mean for each wave to zero and standard deviation to one. The standardized score gap shows similar pattern that the score gap is 0.75 standard deviations in the first wave and then it decreases to 0.56 in the second wave.

Table 1 also presents two more subjective measures of educational outcome in both waves. All parents are asked about the overall satisfaction level about the school their children attend. Among the three groups, parents of migrant children in public schools are the most satisfied, with 44% of them reporting “very satisfied” in the first wave. For parents of Shanghai students and parents of migrant children in migrant schools, the percentages of reporting “very satisfied” are only 26% and 23%, respectively. This pattern remain similar in the second wave, except that the proportion of the group reporting “very satisfied” of migrant parents in both school types increases slightly while this ratio of Shanghai parents decreased slightly. For parents of migrant children, we have also asked them to directly assess the quality of schools as compared to the average-quality schools in their home town. Contrary to parental satisfaction, the parent assessed school quality increases much more in migrant schools than in public schools, implying that the progress of migrant schools between the two waves might be more pronounced.

We also compare the attrition rate between the two waves among the three groups. This rate of migrant students in migrant schools is 18.4%, the highest among the three groups, and migrant students in public schools have a much lower attrition rate of 7.2%. Shanghai students have only 1.7% attrition rate. This attrition rate disparity is consistent with that migrant students are more likely to transfer between schools or cities because of their parent job changes. For students in migrant schools, there might be two more reasons that they have higher attrition rate: 1) they are more likely to return to hometown because they are less likely to attend to public middle schools in Shanghai; 2) parents who chose to go to migrant schools might pre-plan to return back home or migrant to other cities.

This attrition disparity of migrant students between the two-school types is consistent with student post-graduation outcome. Only 53% of students graduated from migrant schools can stay in Shanghai and 25% of them have return back to hometown, while for their counterpart peers who are more luckily to enter public schools, around 71.6% can stay in Shanghai and only 6% return back home. Given that the rest proportion of students, around 22%, do not respond to our telephone interview, mostly due to change in telephone contacts, we assume that a large proportion of unknown contacts are those who have already left Shanghai.

In terms of student characteristics, compared to Shanghai students, migrant students are older, more likely to be boys with siblings, and less likely to have attended kindergarten. This is especially so for migrant students from migrant schools. Parents of migrant students from migrant schools have significantly lower levels of education and lower family incomes than migrant parents from public schools. Shanghai parents have much higher education levels than migrant parents, but their family incomes do not differ much from migrant parents in public schools. It is important to note that the public schools we have selected are in the lower end of the distribution in terms of school quality among all public schools in Shanghai. Parents of Shanghai students from these public schools are thus of relatively lower social economic status as compared to other Shanghai parents who could transfer their students to better schools.

### **3.2: The Progress of Migrant Schools from 2010 to 2012.**

We then estimate equation (1) to evaluate how migrant students' academic performances differ in the two school types and how this disparity change between 2010 and 2012. To avoid selection bias of student attrition or new transferred students, we restrict our sample to those who appear in both of our waves. After controlling for gender, age, single child, rural *HuKou*, kindergarten, years since parents first migrated, parental education and family income, as well as provinces of origin and fathers' occupation, we find that the standard test scores of students in migrant schools are significantly lower than migrant students in public schools, while this disparity has been decreased rapidly between 2010 to 2012. The first column in Table 2 shows the difference in difference estimator for standardized Mathematics test scores. The test score gaps between migrant and public schools are 0.6 standard deviations in Mathematics in the first wave and this disparity decreases to 0.34 standard deviations in the second wave, that is, the average standardized Mathematics test score in migrant schools has increased by 0.27 standard deviations relative to public schools. After controlling on the IQ in column (2), we the first wave test score gap decreases to -0.49 standard deviations, but the relative improve of migrant schools remain quite similar in magnitude of 0.24 standard deviations.

We then turn to the effects of various student characteristics. Girls on average do significantly worse than

boys in Mathematics. Family background also affects student test scores. Students whose parents migrated earlier perform better on average. One more year's migration experience of parents translates into 0.01 standard deviations in Mathematics score. One possible explanation is that parents who have stayed longer in cities have adapted to local environments better, thus could provide better conditions for their children. The family income of students does not seem to be very related with their test scores, while mothers' education seems to play a significant role.

Our results suggest that school type is one of the most important determinants of the test score gap between migrant students in migrant schools and public schools, and overwhelm the effects of student characteristics and family background. Although the test score gaps are large in magnitude between the two school types, but the gap has been decreased by around 40% to 50% from 2010 to 2012.

Test scores have been widely used to measure the school quality in the literature. However, they only (roughly) measure what students have learned in certain subjects, and do not capture various important aspects of education outcome, such as children's physical and mental health, non-cognitive skills, social behaviors, happiness, etc. In column (3) and (4), we use an alternative measure of outcome: parental-assessment of school quality as compared to schools from their hometown. For migrant parents, they report whether they think the quality of current school is "better than", "similar to", or "worse than" schools from their hometown. Although our parents are coming from various areas in China, the quality of their hometown schools may differ sharply and much of them have been in contact with the schools in their hometown in a long time. However, we believe that their perception of the school quality in their hometown could not change a lot between 2010 and 2012. Therefore, if their comparison between their current schools and hometown schools changes between the two waves, that should account for the quality change of their current schools. As shown in column (3), parents from migrant schools are less likely to view their current schools as "better than" schools from their hometown. *Ceteris paribus*, in the first wave, the probability of reporting "better than schools from hometown" is 32% lower for parents from migrant schools compared to those from public schools. In the second wave, this disparity in probability has decreased by 11%. In column (4), we control for mathematics test scores in both waves and the probability remain almost the same, implying that test score do not affect parental assessment of school quality.

Both of our result of standardized Mathematics test scores and parent over all assessed school quality indicates that there are significant gap in school quality between migrant schools and public schools, but this gap has decreased from 2010 to 2012.

### **3.3: Robustness Checks.**



We then perform a series of robustness checks. First, we have used *HuKou* status to identify migrant students as opposed to Shanghai students. All children without Shanghai *HuKou* are classified as migrant students, including those from other cities and from well-off families. This conceptualization is slightly different from the popular view of “migrant children” who usually come from poor uneducated farm households. Since most of those *non-HuKou* students with good social economic status attend public schools, including those students in our sample might cause over estimation of the score gap attributing to schools. In Panel A of Table 3, we restrict the sample to those with rural *HuKou*, thus exclude anyone who comes from a different city than Shanghai. Panel B excludes all students whose parents have at least college education. Panel B excludes those whose parents owns apartment in Shanghai; Panel C excludes migrant students whose parents earn more than RMB10,000 per month; and Panel D exclude those whose parents have college degree. In all four cases, the coefficients on the migrant school dummy and the difference in difference estimator are similar to our baseline results in Table 2. In addition, whether parent has ever moved for the sake of children’s education is one indicator of how parents value the importance of children’s education. In Panel E, we exclude those whose parents ever changed living places due to children’s education and the results remain similar.

Second, to measure the relative changes of the overall school quality in migrant schools, we need to use all students in public schools for comparison. In Panel F, we include both Shanghai students and migrant students, so that the gap between the two school types reflects the overall gap but not only for migrant students. The gap and the changing of the gap remain similar in magnitude. Note that the sample public schools are those with a large proportion of migrant students and the Shanghai students in these schools usually come from families with lower social economic status. Therefore, we cannot infer that migrant students in public schools enjoy the same education outcome as the overall Shanghai students.

Third, even though we restrict our sample to those students who appear in both waves, our estimation may still be biased if the students attrite are those who score lower in the first wave. By ignoring them, we will exaggerate the progress of migrant schools, that is the difference in difference estimator will be over estimated. We estimate the attrition weight of each students in the first wave and use their attrition probability to weight for our estimation in Equation (1), following the technique in Fitzgerald, Gottschalk and Moffitt, (1998). Our results remain similar, with a slightly lower estimator of the first-wave gap between the two school types and same estimates of the changing in the gap.

### **3.4 Quantile Regression**

So far, we have only look at the average test score gaps between schools types and the

improvement of the average quality of migrant schools. Nevertheless, it would be interesting to see how school type differences affect different for various types of students and who benefit most if the migrant school quality improves. Using quantile regression for Equation (1), we find that, in the first wave, the test score gaps between the two school types are the largest in the lowest quantile and the smallest in the highest quantile. If a weak student is enrolled in migrant schools, then he/she would suffer a large decrease in the test scores than a good student. On the contrary, by looking at the difference in difference estimator, students in migrant schools overall has increased their test scores relative to their counterparts in public schools but the test score gaps increased mostly for those with low quantile. Compared with students in public schools, students in migrant schools at the 10th quantile increase their Mathematics score by 0.45 standard deviations between the two waves. This progress is much less but still significant for students at 25th quantile and at median. For students at higher quantile, 75th and 90th quantile, their progresses are not significant.

#### **4. Possible reasons for improving the test scores in migrant schools.**

The narrowing of the migrant vs. public school test score gap as we discussed above, however, cannot be directly interpreted as the increase of the quality of migrant schools, there could be a lot of other reasons, such as the increase of the student effort and the increase of the parent effort, which could be due to the more increase of the pressure to enter in middle schools in Shanghai for students in migrant schools because our sample students in the second wave are in the last grade in elementary schools. We do a series of checks as following, and our results rule out these possibilities.

##### **4.1: The increase of the study effort of students in migrant schools.**

We use two measures for the student effort: student time daily spent on homework and how often do they seek for the help from teachers. In Table 5, we conduct a similar difference in difference estimation as in Equation (1), with the outcome variables as the above measures of student effort, as shown in column (1) and (2) in Table 5. There is no evidence that students in migrant schools increase more effort from the first to second wave. We find student daily time

spent on homework do not differ significantly between the two school types in the first wave and, in opposite, the students in migrant schools seems work even less on homework in the second wave. As for the frequency of seeking help from the teachers, students in migrant schools are less likely to ask help from teachers and there is no significant change in this disparity between the two school types.

#### **4.2: Increase of the effort of parents in migrant schools**

To measure the effort of parents, we examine at the following five variables: 1) how often do parents tutor students in homework; 2) how many hours do parents spend on tutoring student homework; 3) what is the parent expectation of children's ultimate education attainment; 4) how important do parents think current study would affect children's future; and 5) whether the master teacher in the class think the parent care about the students' study. The estimation results are presented in column (3) to (7) in Table 5 and the detail definition of these variables are listed in footnote in Table 5.

The differences of these measures in the first wave, in general, show that parents in migrant schools take less effort and take the children's study less seriously than their counterparts in public schools. They spent less time tutoring the student's homework, have less expectation on children's ultimate education, and are less likely to think study is very important for student's future. The exception is that teachers in migrant schools are more likely to think that parents care a lot for student's study. However, since the criteria of teachers from public schools and migrant schools are different, and it is more likely that teachers from public schools have higher requirement on parents, therefore the difference of teacher evaluated parent involvement level in a single wave comparison is meaningless.

More importantly, the difference in difference estimator of these variables are all insignificant, meaning that there is no evidence of the increase of parent efforts in migrant schools.

#### **4.3: More incentive to study in order to enter middle schools in Shanghai in migrant schools**

As the sample students in our second wave are in the fifth grade in elementary schools and they have to choose between enter middle schools in Shanghai or back in their hometown. In most cases, parents would still like to have their children to study in middle schools in Shanghai. Because if their children has to go back home for study, either the student have to go back home by themselves or the parent have to quit their job in Shanghai to go back home with their children<sup>5</sup>. There are no migrant middle schools in Shanghai and a few number of private middle schools are those charge very high fees which usually cannot be afforded by migrant parents. In the meanwhile, students in migrant schools are less likely to enter in public middle schools in Shanghai, as we will discuss in detail about the institution barrier of migrant schools in section 6. Therefore, students in migrant schools may have more incentive to study hard in order to stay in Shanghai. Table 6 presents the Probit model of whether student managed to enter the public middle schools in Shanghai, using our telephone follow-up survey data collected in October 2012 when students already enter in middle schools. We include the migrant schools dummy, standardized mathematics scores, the interaction of migrant school and standardized test score, and all other control variables as in Table 2. The result conforms that students in migrant schools are less likely to stay in Shanghai, however, the probability of whether students could stay in Shanghai are not correlated with their test scores. Therefore, we don't find direct evidence that students in migrant schools would have higher incentive to improve their test scores in order to stay in middle schools in Shanghai.

#### **4.4: The change of school and teachers characteristics**

We then turn to look at the changes of quality in teachers and other characteristics in the school level. Table 7 shows some suggestive evidence on the relative quality of teachers in migrant schools as compared to public schools. Teachers in migrant schools are considerably less experienced, have lower level of education, earn much less than public schools and have higher rate of transfer rate. Class sizes in migrant schools are much larger, as well as student teacher ratio.

In terms of the change in the relative teacher's quality, there is no significant change in the education of teachers, the teaching experiences and tenure increase slightly between 2010 and 2012. This suggests that the teacher composition in migrant schools is quite stable. The class size and student teacher ratio seem to increase slightly from 2010 to 2012. For migrant schools, the average class size increase from 47.5 to 50.0 students. Most significant change between the two rounds are the increase of the salary of teachers between the two rounds. In 2010, there are around 80% teachers in migrant schools earning less than 3000RMB and this rate decreases to 41% in 2012. Only 2% teachers in migrant schools in 2010 earn more than 4000RMB,

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<sup>5</sup> Because migrant students cannot attend college entrance exam in Shanghai, most of them would choose to leave Shanghai in 8<sup>th</sup> or 9<sup>th</sup> grade if parent decide to have their children to enter college.

and in 2012, this ratio of group increases to 24%.

#### **4.5: Increase in government support**

In recent years, Shanghai government has increased both financial and administrator support for migrant schools. In terms of subsidy, per pupil subsidy has increased from zero in 2007, to 2000RMB in 2008, 4500RMB in 2010 and 5000RMB in 2012 and they are expected to increase to 7000RMB in 2015, as shown in Figure 1. Although this subsidy is much less compared to subsidies in public schools of 17000RMB in 2012, according to our interview with migrant school principle and teachers, the increase of the government subsidy certainly increase the school environment, stability of teacher composition and most importantly the work effort of teachers. On the other hand, the support of administrator and monitor on migrant school quality has also improved significantly. Around 45% teachers in migrant schools report that they often attend formal training in 2012, compared to around 52% teachers in public schools report so. In addition, teachers in migrant schools have even more informal training opportunities than public schools, with 86% of them report often attend informal training, and this rate in public schools is 75%. In terms of school quality monitor programs, the district education bureau has increase the frequency and intensity of teaching quality monitor. Nevertheless, in this paper, we don't evaluate the direct policy effect on the increase of migrant school qualities. In doing so, we will need to sample more schools and among difference areas that have difference in the change of policy, that is, use natural experiment to implement policy evaluation, which is beyond the scope of this paper. However, we hope this paper at least provide a rough link between increase in government support and rise in school qualities.

#### **5. Institutional Barrier**

So far, we have discussed on the rise in school quality of migrant schools. But migrant school still face large institutional barrier, in terms of teacher's job security and student enrollment to middle schools in Shanghai.

We collect the student after graduation information by telephone interview their parents in October 2012, two months after they enter middle schools. We ask whether the student have entered in middle schools in Shanghai, move to other cities or move back home. Summary statistics for this variable have already been shown in Table 1 and discussed in section 4.1. Around 80% of migrant parents accept our telephone interview and the rest 20% in most cases are those who have changed their telephone numbers as some of them may migrant to other cities.

In Table 6, we report the marginal effect of probit estimation on whether students manage to enter in middle schools in Shanghai. Students in migrant schools are 22% less likely to enter in middle schools in

Shanghai. As we include the student test scores in column (2) and (3), this estimate remains almost unchanged and the test score are not correlated with the probability of entering in middle schools in Shanghai, as we discussed in section 5.3.

There might be other reasons, instead of institutional barriers of migrant schools, why students in migrant schools are less likely to stay in Shanghai for middle schools. Parents who choose migrant schools may be those short term migrants and who plan to go back to hometown not for the sake of children's education. We, therefore, do a series checks to explore these possibilities. In column (4) to (6), we exclude respectively for parents who report that they prefer migrant schools; parents who plan to leave Shanghai within five years; parents who came to Shanghai for less than five years. The estimates of migrant schools decreases slightly by 2 to 4 percentage point, but still remain highly significant. Therefore, parent migrant plans are not the reason why students in migrant schools are less likely to stay in Shanghai for middle schools.

In addition, institutional barriers of migrant schools, such as teacher's job security, school administer problems and also the probability of entering middle schools in Shanghai as we discussed above, may also affect parent overall satisfaction about school. In our survey, parents are asked to report whether they are "very satisfied", "satisfied", or "not satisfied" with the current school their children attend. Table 8 shows results for both ordered Probit regressions. The numbers shown in the table are marginal effects representing the probability of changing from "satisfied" to "very satisfied". In general, parents in migrant schools are significantly less satisfied with schools than their counterparts in public schools. Holding everything else constant, if a student is transferred from a migrant school to a public school, then the probability of reporting "very satisfied" (as compared to "satisfied") would increase by 24% in the first wave. This difference in difference estimator is insignificant, implying that overall parent satisfaction has not changed, even though we have shown that the average test scores, the overall parent assessed school quality has improved significantly. We then further control for the standardized test score in column (2) of Table 8. Parent overall satisfaction increases with student test scores, but the overall satisfaction disparity between the two school types and the unchanged of parent satisfaction between the two waves remain similar.

## **6. Conclusion**

In this paper, we find relative quality of migrant schools in Shanghai has improved significantly from 2010 to 2012, using the measure of student Mathematics test score and parent assessed school quality. The improvement of the school quality benefits more for students with lower test scores. We explore for several

reasons why test score gap between migrant schools and public schools has narrowed and find that the narrowing in the test score gap cannot be contributed to the increase in effort of parents or students in migrant schools, but rather be more related to the increase in government financial and administrative support. Future work need to be done to evaluation the specific policy effect on improving the quality of migrant schools.

On the other hand, the institutional barrier of migrant schools remains. Students in migrant schools are less likely to enter in public middle schools in Shanghai and the overall parental satisfaction of migrant schools remains unchanged. Government support policy should also focus on remove the institutional barrier of migrant schools.

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**Table 1 Summary Statistics**

		Public schools		
		Shanghai students	Migrant students	Migrant schools
Sample Size				
	- wave 1	601	459	784
	- wave 2	605	455	784
Math score				
	- wave 1	64.4	63.0	47.5
	- wave 2	59.8	56.2	45.4
standardized math				
	- wave 1	0.50	0.43	-0.32
	- wave 2	0.48	0.29	-0.27
IQ test score (wave 2)		11.49	11.61	10.47
Parental satis (wave 1)				
	-not satisfied	5.7%	2.6%	10.1%
	-Satisfied	68.5%	53.3%	67.0%
	-very satisfied	25.8%	44.1%	23.0%
Parental satis (wave 2)				
	-not satisfied	5.7%	2.0%	8.6%
	-Satisfied	69.9%	50.7%	63.8%
	-very satisfied	24.4%	47.4%	27.7%
Parental accessed school quality (wave 1)				
	- worse		4.6%	11.9%
	- similar		15.2%	40.9%
	- better		80.1%	47.2%
Parental accessed school quality (wave 2)				
	- worse		4.9%	10.1%
	- similar		16.5%	35.5%
	- better		78.6%	54.5%
Attri. Between waves (%)		1.7%	7.2%	18.4%
Post-graduation				
	- school in Shanghai		71.6%	53.5%
	- school in hometown		6.0%	25.2%
	- others		0.0%	0.3%
	- Don't Know		22.5%	21.1%
Age (wave 2)		11.4	11.6	11.6
female		0.5	0.4	0.4
rural hukou		0.1	0.7	0.9
single child		1.0	0.4	0.3
kindergarten		1.0	1.0	0.9
father high sch		0.80	0.45	0.27
mother high sch		0.76	0.29	0.18
family Income (wave 2)				
	-Below RMB3000	0.21	0.16	0.31
	-RMB3000-5000	0.31	0.37	0.45
	-Above RMB5000	0.48	0.47	0.24

**Table 2 The progress of migrant schools between 2010 and 2012**

VARIABLES	Standardized Math Score		Parent Assessed School Quality	
	(1)	(2)	(3)	(4)
Migrant school	-0.61*** (0.12)	-0.49*** (0.11)	-0.32*** (0.03)	-0.31*** (0.03)
Migrant School*wave2	0.27*** (0.09)	0.24** (0.09)	0.11*** (0.04)	0.11*** (0.04)
Standardized Math Score				0.02 (0.01)
Standardized Math Score*wave2				0.01 (0.02)
IQ		0.14*** (0.01)	0.01* (0.01)	0.01 (0.01)
wave2	-0.42 (0.50)	-0.17 (0.53)	-0.37 (0.27)	-0.35 (0.26)
Rural Hukou	-0.17 (0.12)	-0.13 (0.11)	0.03 (0.04)	0.03 (0.04)
Female	-0.10** (0.04)	-0.07* (0.04)	-0.02 (0.03)	-0.02 (0.03)
Kindergarten	0.01 (0.09)	-0.03 (0.09)	0.01 (0.04)	0.01 (0.04)
Age in month <sup>a</sup>	-0.01* (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Single Child <sup>a</sup>	0.10 (0.06)	0.08 (0.06)	-0.01 (0.03)	-0.01 (0.03)
Family income 3000-5000 <sup>a</sup>	0.10 (0.06)	0.06 (0.06)	0.04 (0.03)	0.04 (0.03)
Family income>5000 <sup>a</sup>	0.10 (0.06)	0.05 (0.06)	0.05 (0.04)	0.05 (0.04)
Father high sch <sup>a</sup>	0.06 (0.07)	-0.02 (0.06)	0.00 (0.04)	0.00 (0.04)
Mother high sch <sup>a</sup>	0.16* (0.09)	0.20** (0.08)	-0.02 (0.03)	-0.02 (0.03)
Year since mig	0.01*** (0.01)	0.01*** (0.00)	0.00 (0.00)	0.00 (0.00)
Province of origin dummies	Yes	Yes	Yes	Yes
Father's occupation dummies	Yes	Yes	Yes	Yes
Observations	2,482	2,482	2,482	2,482
Adjusted R-squared	0.162	0.263		

Note: a) all these variables are also interacted with Wave2. Standard errors cluster in class in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 3 Robustness Check**

	(1)	(2)	(3)	(4)	(5)
	NOT Control IQ		Control IQ		# of students
	Migrant School	Migrant School *wave2	Migrant School	Migrant School *wave2	% in public
A. Include only Rural Hukou students					
	-0.65***	0.29***	-0.53***	0.27**	2,088
	(0.13)	(0.10)	(0.12)	(0.10)	69.1%
B. Exclude those whose parents own an apartment in Shanghai.					
	-0.60***	0.30***	-0.47***	0.27***	2,240
	(0.12)	(0.09)	(0.11)	(0.09)	66.2%
C. Only include students with family monthly income less than RMB10,000					
	-0.61***	0.25***	-0.49***	0.24**	2,317
	(0.12)	(0.09)	(0.11)	(0.09)	65.3%
D. Only include students with parental education lower than college					
	-0.61***	0.26***	-0.50***	0.24**	2,337
	(0.12)	(0.10)	(0.11)	(0.10)	64.8%
E. Those who did not change living place due to children's education					
	-0.64***	0.37***	-0.56***	0.34***	1,396
	(0.14)	(0.11)	(0.13)	(0.11)	60.0%
F. Include both Shanghai Student and Migrant Students					
	-0.65***	0.27***	-0.53***	0.25***	4155
	(0.12)	(0.09)	(0.11)	(0.09)	49.4%
G. Attrition Weighted					
	-0.55***	0.29***	-0.42***	0.24**	2,459
	(0.13)	(0.10)	(0.11)	(0.10)	63.00%

Note: all the regressions includes the same set of variables in Table 2.

Standard errors cluster in class in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 4 Quantile Regression Result**

	(1)	(2)	(3)	(4)	(5)
	Quantile 10	Quantile 25	Median	Quantile 75	Quantile 90
Migrant School	-0.57***	-0.57***	-0.48***	-0.43***	-0.37***
	(0.09)	(0.06)	(0.08)	(0.08)	(0.09)
Migrant School*wave2	0.45***	0.34***	0.34***	0.07	-0.10
	(0.12)	(0.09)	(0.11)	(0.12)	(0.13)

Note: all the regressions include the same set of variables in Table 2.

Standard errors cluster in class in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 5 Student study effort or parent effort disparity between the two school types**

VARIABLES	Migrant school		Migrant School*wave2	
	coefficient	s.e	coefficient	s.e
1 Time Spent on Homework of the student	-0.01	(0.03)	-0.07*	(0.04)
2 How often do you ask your teacher to help you	-0.13***	(0.04)	0.06	(0.04)
3 How often do your Parent tutor your homework	-0.01	(0.04)	0.07	(0.04)
4 Weekly Hours parent spend on tutoring student homework	-0.12**	(0.06)	0.06	(0.06)
5 How parent think study is important	-0.10***	(0.03)	0.02	(0.04)
6 Parent Expectation of children ultimate education level	-0.07**	(0.03)	0.01	(0.03)
7 Whether parent care about the student study at school as evaluated by the master teacher	0.20***	(0.05)	0.04	(0.06)

Note: All dependent variables are reported in ordered categories, so we use ordered probit, except for Row 4 where weekly hours parent spend on tutoring is a continuous variable and we use OLS estimator. Numbers reported are marginal effects of ordered probit, not regression coefficients, except for Row 4. Reported numbers represent marginal changes in probability from the middle category to the highest category.

For “time spent on homework of the student”, reported numbers represent marginal changes in probability from “1-2 hour on homework” to “more than 2 hour in homework”.

For “how often do you ask your teacher for help”, reported numbers represent marginal changes in probability from “occasionally” to “often”.

For “how often do your parent tutor your homework”, reported numbers represent marginal changes in probability from “1-2 times” to “more than 2 times”.

For “how parent think study is important”, reported numbers represent marginal changes in probability from “average” to “very important”.

For “parent expectation of children ultimate education”, reported numbers represent marginal changes in probability from “vocational schools” to “college”.

For “teachers evaluation of parent care level on student study”, reported numbers represent marginal changes in probability from “average” to “very care”.

Numbers reported in parentheses are standard errors clustered at the class level. all the regressions include the same set of variables in Table 2.

\*\*\*, \*\*, and \* stands for statistical significance at the 1%, 5% and 10% level, respectively

**Table 6 Probability of entering in middle schools in Shanghai**

	(1)	(2)	(3)	(4)	(5)	(6)
				Exclude those who prefer to go to migrant schools	Exclude those who plan to leave Shanghai within 5 years	Exclude those who came to Shanghai for less than five years
Marginal effect of probit	ALL	ALL	ALL			
Migrant school	-0.22*** (0.03)	-0.23*** (0.03)	-0.22*** (0.03)	-0.20*** (0.03)	-0.18*** (0.03)	-0.22*** (0.03)
Standardized Math Score		-0.01 (0.01)	0.01 (0.03)	0.01 (0.02)	-0.01 (0.03)	0.01 (0.03)
Migrant*Math Score			-0.02 (0.03)	-0.01 (0.03)	-0.00 (0.03)	-0.02 (0.03)
IQ	0.02*** (0.00)	0.02*** (0.00)	0.02*** (0.00)	0.02*** (0.01)	0.01** (0.01)	0.02*** (0.01)
Rural Hukou	-0.04 (0.04)	-0.04 (0.04)	-0.04 (0.04)	-0.03 (0.04)	-0.07 (0.05)	-0.03 (0.04)
Female	0.05** (0.02)	0.05** (0.02)	0.05** (0.02)	0.06** (0.03)	0.03 (0.03)	0.06** (0.03)
Age in month <sup>a</sup>	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Single Child <sup>a</sup>	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)	0.04 (0.03)	0.02 (0.03)	0.03 (0.03)
Kindergarten	0.04 (0.04)	0.04 (0.04)	0.04 (0.04)	0.01 (0.05)	0.06 (0.04)	0.02 (0.05)
Family income 3000-5000 <sup>a</sup>	0.01 (0.03)	0.02 (0.03)	0.02 (0.03)	-0.01 (0.03)	0.02 (0.03)	0.02 (0.03)
Family income>5000 <sup>a</sup>	0.01 (0.03)	0.01 (0.03)	0.01 (0.03)	0.00 (0.04)	0.02 (0.04)	0.01 (0.04)
Father high sch <sup>a</sup>	0.02 (0.03)	0.02 (0.03)	0.02 (0.03)	0.02 (0.03)	0.00 (0.03)	0.02 (0.03)
Mother high sch <sup>a</sup>	0.06* (0.04)	0.06* (0.04)	0.06* (0.04)	0.07* (0.04)	0.04 (0.04)	0.08** (0.04)
Year since mig	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Province of origin dummies	Yes	Yes	Yes	Yes	Yes	Yes
Father's occupation dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,144	1,144	1,144	963	852	1,074

Note: a)

all these variables are also interacted with Wave2. Standard errors cluster in class in parentheses.  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 7 Characteristics of schools and teachers**

	2010		2012	
	Migrant School	Public	Migrant School	Public
classsize	47.5	31.5	50.0	31.1
student teacher ratio	22.3	11.4	23.6	11.7
Teaching experience (years)				
- Less than 3 years	0.08	0.01	0.03	0.02
- 1 to 2 years	0.16	0.03	0.10	0.02
- 3 to 5 years	0.38	0.07	0.34	0.06
- 6 to 9 years	0.11	0.05	0.21	0.08
- More than 10 years	0.28	0.85	0.32	0.82
Teacher's Tenure (years)				
- Less than 3 years	0.14	0.02	0.06	0.02
- 1 to 2 years	0.53	0.05	0.12	0.03
- 3 to 5 years	0.27	0.10	0.69	0.12
- 6 to 9 years	0.06	0.14	0.10	0.16
- More than 10 years	0.00	0.69	0.03	0.67
Teachers' education				
- High school and below	0.24	0.05	0.21	0.02
- Associate degree	0.59	0.36	0.60	0.32
- Bachelor's degree and above	0.16	0.58	0.19	0.66
Monthly salary				
- Below RMB2000	0.34	0.00		
- RMB2000 to RMB3000	0.46	0.01	0.41	0.00
- RMB3000 to RMB4000	0.18	0.03	0.35	0.03
- RMB4000 to RMB5000	0.02	0.26	0.23	0.11
- Above RMB5000	0.00	0.71	0.01	0.87

**Table 8 Parent overall satisfaction of schools**

VARIABLES	(1)	(2)
Migrant school	-0.24***	-0.22***
	(0.03)	(0.03)
Migrant School*wave2	0.04	0.03
	(0.04)	(0.04)
Standarizd Math Score		0.03**
		(0.02)
Standarizd Math Score*wave2		0.01
		(0.02)
IQ	0.01	0.00
	(0.00)	(0.00)
wave2	0.26	0.26
	(0.26)	(0.26)
Rural Hukou	0.02	0.02
	(0.04)	(0.04)
Female	-0.02	-0.01
	(0.02)	(0.02)
Age in month <sup>a</sup>	0.00	0.00
	(0.00)	(0.00)
Single Child <sup>a</sup>	-0.05*	-0.06**
	(0.03)	(0.03)
Kindergarten	-0.01	-0.01
	(0.05)	(0.05)
Family income 3000-5000 <sup>a</sup>	-0.01	-0.02
	(0.03)	(0.03)
Family income>5000 <sup>a</sup>	-0.03	-0.04
	(0.03)	(0.03)
Father high sch <sup>a</sup>	-0.06**	-0.06**
	(0.03)	(0.03)
Mother high sch <sup>a</sup>	0.03	0.03
	(0.04)	(0.04)
Year since mig	-0.00	-0.00
	(0.00)	(0.00)
Province of origin dummies	Yes	Yes
Father's occupation dummies	Yes	Yes
Observations	2,482	2,482

Note: Numbers reported are marginal effects, not regression coefficients. Reported numbers represent marginal changes in probability from being “satisfied” to “very satisfied”.

The control variables are the same as in Table 2.

Numbers reported in parentheses are standard errors clustered at the class level. \*\*\*, \*\*, and \* stands for statistical significance at the 1%, 5% and 10% level, respectively.



**Figure 1 Increase of annual subsidy per pupil in migrant schools**

