The Impact of Removing Selective Migration Restrictions on Education: Evidence from China*

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Abstract: An open question in migration research is how the removal of migration selectivity affects migrants' education decisions. I analyze this question in the Chinese context, in which the household registration system imposes selective rural-urban migration restrictions. The identification derives from a policy change that grants urban residency to a group of rural individuals based on their dates of birth. Using a regression discontinuity approach, I find that educational attainments for barely eligible rural residents decreased sharply after the reform. These effects are larger for males and for those able to permanently migrate to relatively rich areas.

Keywords: Migration; Education; Brain Drain; Regression Discontinuity; China
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1. INTRODUCTION

This paper studies the impact of removing migration selectivity on education. To improve the allocative efficiency in the labor market, countries have allowed for controlled and selected migration (Docquier & Rapoport, 2012). One step further in this process is the free allocation of labor regardless of skill levels, such as the free movement of workers in the European Union and the relaxed internal migration barrier in China. However, if the selective migration scheme has induced stronger incentives to invest in education, policies that remove migration restrictions may lead to lower levels of educational attainment. While extensive work has been conducted on the changes in skill compositions when a closed economy allows for selective emigration (as seen in the literature regarding debate over "brain drain" versus "brain gain"),[1] surprisingly there is little empirical evidence on the educational consequences of the shift from selected to free mobility. This paper aims to fill this gap with an analysis of the issue within the context of China. In particular, I investigate the impact of removing the selective internal rural-urban migration restrictions on the educational attainment of rural youth.

In China, rural-urban migrations are tightly restricted by the household registration system known as Hukou, a system that categorizes people as rural or urban at birth according to their parents' status. While rural people are nowadays allowed to temporarily seek employment opportunities in urban areas, migrants without local urban Hukou have limited job choices which mainly involve low paid work in poor conditions. More strikingly, while subject to the same taxes as legal urban residents, rural migrants (like illegal immigrants in other countries) cannot enjoy any urban benefits such as health care, unemployment insurance, housing subsidies, pensions, etc. To overcome the mobility restrictions, many rural youth strategically pursue post-compulsory education. Once enrolled in technical (vocational) high school or college, they are automatically granted urban Hukou. Such incentives to stay in school disappear after the removal of selective mobility restrictions.

In order to examine the impact of removing the rural-urban Hukou migration restriction on education, I analyze a change made to the Hukou inheritance law in September 1998. Before this change, individuals inherited their mother's Hukou status. After September 1998, it became possible for newborn children to inherit their father's status. In addition, children under the age of 18 year subsequently had the chance to transfer the status of their Hukou from that of their mother to that of their father, which differentially benefited individuals with a rural mother

[1] See Docquier & Rapoport (2012) for a detailed review of studies on "brain drain" versus "brain gain".

and an urban father. These individuals could obtain urban Hukou and its associated benefits without higher education. This is a non-trivial group given that one fifth of urban males marry rural females in China.[2] On the one hand, obtaining urban status via Hukou transfer eliminates these beneficiaries' incentives to pursue higher education for urban benefits. On the other hand, their wage returns to education may increase given better job opportunities brought by the urban status. The direction of the net impact is theoretically uncertain and is left for empirical study.

I apply a regression discontinuity (RD) approach in this study to estimate the net impact of the Hukou reform on high school attendance. The age eligibility rule of this policy change, i.e. less than 18 years old by September 1998, implies a birth eligibility cutoff of September 1980. Thus, I compare the high school attendance between cohorts born before and after September 1980. Nonparametric estimation results show that the high school attendance rate drops by 8.8 percentage points for barely eligible cohorts compared with those barely ineligible. These results are mainly driven by a reduction in technical high school enrollment. In addition, the effects are larger for males and for those able to obtain urban Hukou in relatively rich areas.

Note that the influence of the reform in determining the students' decision to attend high school is relative to whether the decision was made before or after the implementation of the new policy. If the 1998 Hukou reform was fully unexpected, then it only affects the high school attendance decisions of individuals who made such decisions after the reform. Given the substantial variations in the timing of the decision to attend high school within each birth cohort, only a proportion of eligible individuals were able to adjust their high school attendance choices according to the new policy. Hence, the results obtained above constitute a reduced form effect of eligibility for Hukou transfer. Unfortunately, the timing of the decision to attend high school is not reported in my data. I cannot consistently estimate local average treatment effect (LATE) of the ability for adjusting high school decision according to the new policy by "fuzzy" RD design that uses eligibility as an instrument for ability. To get an idea of how large the LATE would be, I rescale the reduced form estimate with an approximated proportion of individuals making their high school decision after the reform. The reduction in high school attendance enlarges to 17 percentage points after rescaling. All the findings above show that a removal of the selective mobility restrictions substantially lowers rural youth's educational attainment in China.

This research contributes to a main strand in the migration literature regarding

[2] Author's calculation based on the 2000 census data.

changes in skill composition in the process of labor market integration. The relaxation of mobility restrictions generally consists of two phases: (1) the shift from a closed economy to restricted migration, which is often selected on the basis of skill levels; and (2) the shift from restricted migration to free migration. In the first phase, "brain drain" supporters argue that selective migration extracts talented people from poor to rich countries (Bhagwati & Hamada, 1974). In contrast, some theoretical and empirical studies point out the possibility of "brain gain" since the future chance of emigrating to developed countries raises the expected returns to education.[3] This paper adds new findings to the above "brain drain" versus "brain gain" literature by investigating educational investment changes during the shift from a selective migration scheme to a free migration scheme (which no longer selects migrants on the basis of education). This shift represents a contemporary migration pattern in both developing and developed regions, as seen in the relaxed internal migration restrictions in China and in the free movement of workers in the enlarged European Union. This paper is among the first to empirically analyze changes in education decisions during the second phase of labor market integration.

In addition to contributing to the "brain drain" vs "brain gain" literature, this paper also adds new findings to the literature on the educational consequences of reforms that remove the "strategic" demand for education. Most of the work along these lines focuses on draft avoidance as an incentive to education (Angrist & Krueger, 1992; Card & Lemieux, 2001; Bauer et al., 2014). In many countries, government policy allows students to temporarily avoid compulsory military service by enrolling in higher education. As a consequence, such policy increases the demand for education among young men. Maurin & Xenogiani (2007) further show that the abolition of conscription in France results in a fall in men's educational attainment and a decrease in their entry wages relative to women. Pietro (2013), in contrast, finds no overall effect of the dismissal of mandatory military services on schooling in Italy. Instead of draft avoidance, this paper focuses on the educational consequences of removing policies that induce strategic investment in education for mobility purposes. In particular, this study documents a decline in enrollment in post-compulsory education that takes place after selective migration restrictions have been removed.

Most importantly, my analysis provides policy implications for contemporary China. In order to mitigate the unbalanced development between rural and urban areas, a

[3] See Mountford (1997), Stark, Helmenstein & Prskawetz (1997, 1998) and Vidal (1998) for theoretically arguments and Beine, Docquier & Rapoport (2001, 2008, 2010), Chand & Clemens (2008) and Batista, Lacuesta & Vicente (2012) for empirical evidence.

few provinces have used uniform Hukou identity to replace the original rural/urban dichotomy since 2002. The elimination of rural/urban Hukou status erases part of the returns to education for the previous rural Hukou holders, which may in turn negatively affect their investment in education. The policy implications of this may go beyond China. This study highlights the fact that higher education may serve as a means of escaping poverty if it increases the probability of obtaining legal residency in more developed areas. Any policy that removes or relaxes selective mobility restrictions needs to take this fact into account. It remains an open question, however, as to whether the effect on education will harm later labor market outcomes.

The rest of this paper is structured as follows: Section 2 provides the institutional background of the Hukou system and outlines the change of Hukou inheritance law in 1998. Section 3 describes the main data source used in this study. The identification strategy and main estimation results are provided in Section 4. In Section 5, I test assumptions required for a valid RD design, check if my results are driven by the school enrollment cutoff and discuss other reforms in the same study period. Section 6 briefly discusses policy implications, and section 7 concludes.

2. INSTITUTIONAL BACKGROUND

China's household registration system (the Hukou system) is one of the strictest population regulation mechanisms in the world.[4] The two most important pieces of information in a Hukou record are the Hukou status (urban/rural) and the legal residence address. Both of these registration records were passed on from mother to child until the policy was reformed in 1998, at which point these records could also be passed on from father to child. In either case, this information is registered at birth for every legal Chinese citizen, remains active during the entire lifetime of that person, and is extremely hard to change.

Until the 1980s, the Hukou system, combined with China's food rationing policy, effectively tied people to their registered place of residency. Rural people relied on their land to support themselves while the government provided health care services, unemployment insurance, housing subsidies, pensions, etc. to urban residents. It was almost impossible to migrate without legally changed Hukou because of rigid food rationing and the absence of commodity markets. As a result, the Hukou system has been criticized as a major cause of the undersized Chinese cities (Fujita et al., 2004; Au & Henderson, 2006*a*,*b*), the insufficient agglomeration in rural industries (Au & Henderson, 2006*b*), and the rising rural-urban inequality (Yang,

[4] See Wu & Treiman (2004) and Chan (2009) for a detailed description of the Hukou system.

1999; Wu & Treiman, 2004; Liu, 2005; Whalley & Zhang, 2007; Chan, 2009).

Higher education has been one of the few ways for rural Chinese to obtain urban Hukou.[5] After finishing 9 years of compulsory primary and middle school education, students can either attend high school or work directly. There are two types of high school: regular and technical (vocational). Even though obtaining a regular high school degree does not guarantee an urban Hukou, it provides an opportunity for tertiary education. Newly admitted students to technical high school, junior college and above are automatically granted urban Hukou.[6,7] For rural students, the returns to high school education include not only the higher future income, a frequent topic of study in the literature, but also potential dramatic welfare benefits associated with urban status.

There have been some studies that have analyzed the relation between Hukou status and educational attainment since the 1990s. Most of these have documented the importance of rural origin in determining lower levels of schooling (Wu, 2010; Wu & Treiman, 2004), and the importance of schooling itself, especially a high school or college degree, in transferring transfer Hukou from rural to urban areas (Wu & Treiman, 2004). The only study, however, to have treated education as a choice variable was made by Zhao (1997) who was the first to incorporate the schooling choice into the calculation of expected future income. She points out that the incentive for pursuing high school education is partly rooted in the chance of changing Hukou status. Her calculation shows that the rate of returns to high school education via promoting education was 4.3% in 1985. Even though her calculation takes into account some non-wage benefits brought about by urban status, such as food ration coupons and subsidized housing, data limitations mean that this calculation does not include other benefits, such as health care, pensions and benefits that are transferable across different generations. In addition, her paper does not empirically analyze how the additional migration-related returns affect educational attainment. A series of recent Hukou reforms allow me to directly address this question.

In China, the relaxation of the rural-urban mobility barriers consists of two main phases. In the first phase, the economic reform, launched in 1978, allowed rural

[5]Other ways of changing one's Hukou status from rural to urban have been mainly through a job assignment after military service or employment through the states. Both the Army and the government place significant emphasis on educational attainment.

[6]Admission to these schools are based on competitive exams, which are equally available to all Chinese citizens. However, rural children are less likely to attend these schools due to the inferior quality of compulsory education in rural areas.

[7]Even though the Hukou transfer is voluntary, most students accept urban Hukou given the enormous benefits associated with it. While rejection of urban Hukou is now rare, it was especially unusual in the last century when it played an even more significant role than it does today.

people to temporarily migrate to urban areas. They could apply for a temporary resident permit, which granted them legal residency for a few months and was subject to renewal. However, the relaxed migration restriction only guaranteed controlled and limited mobility for rural labor. Temporary migrants were highly discriminated against, both inside and outside of the labor market, and they normally took up low-paying jobs with poor working conditions. While subject to taxes, they were still denied access to urban social welfare benefits (Wang & Zuo, 1999).

The second phase of removing mobility restrictions in China aims to fully abandon the rural-urban dichotomy and the discrimination associated with it. A first attempt at introducing this phase was the change in Hukou inheritance law studied in this paper. Until this change in September 1998, newborn children in China had to inherit their mother's Hukou status (rural/urban). After this reform, newborn children were also allowed to inherit their father's Hukou status. While this Hukou reform was initially proposed by the Ministry of Public Security on June 23, 1998, and even though it was approved by the State Council a month later on July 22, it was not put into practice until the beginning of September. In addition, children who were under the age of 18 in September 1998 and had inherited their mother's Hukou then had the chance to change their status according to their fathers' Hukou. The beneficiaries of this reform were therefore those born in or after September 1980 and who had a mother who held a rural Hukou and father who helds an urban Hukou.

Obtaining urban Hukou may affect these beneficiaries' education decisions in various ways. On the one hand, directly granting individuals urban Hukou eliminates their incentive to pursue higher education with the aim of possible urban benefits. The decrease in gains from education may thus lower school enrollment. On the other hand, these individuals gain access to better job opportunities with urban status. The wage return to education may increase, which leads to higher school enrollment. The overall effect of obtaining urban Hukou on schooling is the combination of these effects. The sign of the net impact is ambiguous and is left for empirical study.

The study most related to my work is that of De Brauw & Giles (2008). While they show that allowing temporary migration significantly reduces high school enrollment in rural China, there are several differences between their work and mine. Firstly, De De Brauw & Giles (2008) only analyze the impact that a relaxation of the Hukou system has upon high school enrollment. This paper, in contrast, focuses on a complete removal of rural-urban Hukou restrictions. Secondly, the quasi-experimental empirical strategy adopted in this paper allows me to overcome the

problem of endogenous policy change and clearly identify the reform's causal effect on educational attainment. Moreover, De Brauw & Giles (2008) rely on a reform implemented in 1980s. The returns to education and overall school enrollment may differ a lot across time with improved economic conditions. My paper uses a more recent reform to identify the effect of removing selective mobility restrictions on education. In addition, the results of De Brauw & Giles (2008) are based on a survey which covers a few provinces. Using a national representative dataset, I am able to estimate the average impact for all provinces as well as possible heterogeneities across regions.

3. DATA

The data used in this paper come from the 0.095% sample of China's fifth wave population census conducted in 2000. The census collected individual level demographic information as of November 1, 2000, such as month of birth, gender, ethnic minority status, education level, employment status and occupation. Individuals also reported whether their Hukou status was rural or urban as well as Hukou location at province level.

To study the impact of obtaining urban status on high school enrollment decisions,[8] I focus on the subsample consisting of individuals born between September 1971 and August 1986 with an urban father and a rural mother. I further restrict my sample to those with at least some middle school education and drop those who hadn't made their high school decisions by the time of the census. Table 1 shows the summary statistics for my sample. These individuals have on average 1.36 siblings and 63% are male. 43% of these individuals attended high school, among which around one third attended technical high school and two thirds attended regular high school.

4. EMPIRICAL ANALYSIS

In this section, I first outline the RD setup and present the local linear regression results for the change in the high school attendance rate at the eligibility cutoff. Next, I show that individuals' ability to adjust their high school decision was influenced by whether the individual had sufficient time to respond to the 1998 Hukou reform

[8]High school includes both technical and regular high schools. I focus on enrollment in high school instead of college because many individuals in my sample had not made college decisions by the time of the census.

and I then exploit the local average treatment effect using limited information in the data on the timing of the decision to enroll in high school. At the end of this section, I examine heterogeneous impact on subgroups.

4.1 High school attendance change at the eligibility birth cutoff

According to the reform, children born in or after September 1980 who inherited their mother's Hukou status had a chance to change to their father's Hukou, which differentially benefited individuals with a rural mother and an urban father. Thus, the main focus of this study is to examine whether post-compulsory schooling decisions are different between cohorts born before and after September 1980 for individuals within this group. A natural approach to estimating this is a regression discontinuity (RD) design.[9]

In particular, I adopt a non-parametric approach with a triangular kernel suggested by Hahn, Todd & Van der Klaauw (2001) and Porter (2003) to estimate the relationship between an individual's eligibility for Hukou transfer and his/her high school attendance described in the following linear equation:

$$y_i = \alpha + x_i \times \beta + \epsilon_i$$

$$x_i = \begin{cases} 1 & \text{if } z_i \geq z_0 \\ 0 & \text{if } z_i < z_0, \end{cases}$$

where y_i is a binary variable taking the value of 1 if individual i attends high school and zero otherwise; z_i represents birth month of individual i with a cutoff value of z_0 =September 1980 and has been normalized to $z_0 = 0$[10] and x_i is the Hukou transfer eligibility taking the value of 1 if individual i was born after the policy birth cutoff, and it is 0 otherwise. I focus on this intent-to-treat (ITT) effect because the data are not informative about whether an individual utilizes this opportunity to transfer Hukou status or not.

To support this linear specification, I include dummies for each value of the birth month along with a piecewise linear control and test the joint significance of those dummies.[11] If they are jointly significant, then the piecewise linear regression is

[9] I also adopt the conventional difference-in-differences (DID) strategy using OLS, Probit and Klein and Spady semi-parametric estimations. Results are presented in Appendix.

[10] z_i now is the difference between original z_i and z_0, with a negative sign indicating "before". For example, $z_i = 2$ for individuals born in November 1980 and $z_i = -3$ for individuals born in June 1980.

[11] See Lee & Lemieux (2010) for a detailed discussion of this test. Using dummies for bigger bins

misspecified. The test statistic fails to reject the first order polynomial specification with a p-value of 0.6675. I choose a bandwidth of 41 months for the main results based on the leave-one-out cross-validation procedure proposed by Ludwig & Miller (2007) and Imbens & Lemieux (2008) and show that the results are not sensitive to the choice of bandwidth.

Before proceeding to formal analysis, I plot the proportion of students who ever attended high school against month of birth for a sample consisting of those with a rural mother and an urban father. I restrict the sample to individuals with at least some middle school education and exclude those still in middle school at the time of the census.[12] As shown in Figure 1, there is a clear decrease in the high school attendance rate at the cutoff value 0, which represents September 1980.

The local linear regression result presented in Table 2 Row 1 Column 1 is consistent with this visual evidence. Among those attended middle school, the high school attendance rate significantly decreases by 8.8 percentage points for cohorts born just after the threshold of September 1980 compared to those born just before. As the 1998 policy change took place after the annual high school entrance exam in June, there was no time for students to adjust the effort level in middle school. Therefore, this result can be viewed as a short-term effect. In the long term, the negative impact on high school enrollment might be even larger since individuals had the chance to adjust time and money spent on their middle school education. I check the sensitivity of the result to the choice of bandwidth by estimating the same regression using bandwidths ranging between 3 and 70 months. As shown in Figure 2, the estimate is robust to these alternative bandwidths. I will further show other test results for the validity of the RD in Section 5.

The attendance reduction may differ according to high school types. Even if technical high school graduates earn slightly more than regular high school graduates (Li, 2003; Xiu & Gunderson, 2013; Li, Liu & Zhang, 2012), the wage returns to regular high school may well be above that of technical high school when including the option value of college education.[13] Nevertheless, more than one third of high school attendees still chose technical high school in the studied sample before the policy reform.[14] The popularity of technical high school may be a result of the large

generates similar results.

[12]Most of the individuals who are still in middle school were born in 1984 or later. Including them will result in a low high school enrollment rate for later birth cohorts. Nonetheless, the estimated discontinuity at the cutoff of September 1980 is unchanged with these additional observations.

[13]For example, the wage premium of regular high school, technical high school and college degree holders, compared to primary school graduates, were 54%, 68% and 91% in mid-1990s, respectively (Li, 2003). According to the China Education Yearbook, the transition rate from regular high school to college was 49.9% in 1995.

[14]Family backgrounds are similar between technical and regular high school attendants in general.

associated urban benefits.

To investigate if the decrease in attendance rate is different between regular and technical high schools, I estimate the same local linear regression for each school type separately. As shown in Table 3, the technical high school attendance rate decreases significantly by 8.8 percentage points for those eligible for the Hukou transfer. Even though the overall change in regular high school attendance is small and not significant, it does not necessarily mean that regular high school enrollment decisions are not affected when obtaining urban Hukou. The results in Table 3 represent the net effect of switching from technical high school to work, from regular high school to work and from technical to regular high school.

The sample in the high school attendance estimation includes those with at least some middle school education. The estimated drop in high school attendance rate can be divided into two parts: (1) a lowered middle school graduation rate for those ever attended middle school, and (2) a decreased high school enrollment rate for middle school graduates. Since part of the returns to middle school education stems from the option value of attending high school, the reduced benefits associated with a high school degree is expected to weaken the incentive to graduate from middle school.

To test to what extent the change in middle school graduation rate can explain the decreased high school attendance, I run a local linear regression for the middle school graduation rate using the same sample. I use the same bandwidths of 41 months to be consistent with previous analysis. According to the regression results shown in Table 4, the change in the middle school graduation rate at the eligibility cutoff of September 1980 is small and not statistically significant. The unchanged middle school graduation rate may result from the fact that primary and middle school in China is compulsory.

One concern for the estimation strategy is the potential bias due to the "crowding in" effect in high school admission. Since the incentive to pursue high school education weakens for the group consisting of individuals born in or after September 1980 with a rural mother and an urban father, high school enrollment for other groups may increase if admission requirements are less competitive. One of these groups includes individuals born before September 1980 with a rural mother and an urban father. In this case, RD may overestimate the true impact of obtaining urban Hukou on education. However, the policy-affected group is relatively small, constituting only 4.9% of the population. Thus, such "crowding in" effect is small and can be ignored.

To sum up, removing selective rural-urban migration restrictions via the change of Hukou inheritance law in 1998 discouraged rural youth from pursuing post-compulsory education in China. In particular, this reform led to a substantial reduction in technical high school enrollments among middle school graduates, which in turn was responsible for the decline in over all high school attendance rate.

4.2 Timing of decision to enroll in high school and LATE

Note that the influence of the reform in determining the students' decision to attend high school is relative to whether the decision was made before or after the implementation of the new policy. If the 1998 Hukou reform was fully unexpected, then it only affects the high school attendance decisions of individuals who made such decisions after the reform (as illustrated in Figure 3). Since the Hukou policy reform was announced in July 1998, which took place after the high school entrance exam in June and before the high school start date in September, this condition is equivalent to making high school decisions in or after 1998. The variation in the timing of the decision to attend high school within each birth cohort is substantial in China. As shown in Figure 4, which is based on data from the China Health and Nutrition Survey (CHNS), most of the cohort born between September 1980 and August 1981 made their decision to attend high school in 1996, 1997 or 1998 when they were between 15 to 17 years old.[15] Hence only a proportion of eligible individuals were able to adjust their high school attendance choices according to the new policy (shown as the shaded area in Figure 4). Because census data did not report when the decision was made to attend high school, I cannot consistently estimate local average treatment effect (LATE) of the ability for adjusting high school decision according to the new policy by "fuzzy" RD design that uses eligibility as an instrument for ability.

Importantly, when the attendance decisions were made needs to be kept in mind when interpreting the findings from the main estimation strategy outlined in Section 4.1. In particular, the reported results constitute a *reduced form* effect—the effect of eligibility for Hukou transfer regardless of ability to adjust high school decisions. These results therefore underestimate the impact of granting urban status, thus providing a lower bound of the LATE.

I exploit the school status information reported in the 2000 census to get an idea of how large LATE would be. I first calculate the proportion of individuals making

[15]Age here is defined as the age at one's last birthday. For example, the age of a child born on September 1, 1980 is 17 on any date between September 1, 1997 and August 31, 1998. His/her age reaches 18 on September 1, 1998.

their decision to attend high school after the reform for the Sept. 1980-Aug. 1981 cohort, which is equivalent to making high school decisions at an age of 17 or older. Each individual reported the school status of "in school", "finished" or "dropout" in addition to highest education level attended. If individuals born between September 1983 and August 1984 were still in middle school when the census took place in November 2000, they decided whether to enroll or not in high school in or after 2001. Assuming the age distribution at high school decision year is the same across birth cohorts, the proportion of the Sept. 1983-Aug. 1984 cohort who decided on their high school enrollment in or after 2001, which is 28.5% in my sample, can be used to infer the proportion of the barely eligible cohort (Sept. 1980-Aug. 1981) making a high school decision in or after 1998. This proportion then can be used as a rescaling factor for the "raw" discontinuity obtained in Section 4.1 to estimate the local average treatment effect of obtaining urban status on high school attendance.[16] After rescaling, the reduction in high school attendance rate enlarges from 8.8 to 31 percentage points.

The estimated impact would be biased if the proportion of late high school decider differs by cohorts. Figure 5 plots the proportion of those making high school decisions at an age of 17 or older across cohorts using data from the CHNS. This sample includes all individuals born between September 1980 and August 1984 regardless of their parents' Hukou status. This proportion exhibits a downward trend. Assuming the time trend is the same for the CHNS sample and the census subsample consisting of only those with a rural mother and an urban father, I obtain the "biased-corrected" LATE of 17 percentage points.

The effect obtained here can be interpreted as the local average treatment effect for individuals making their high school decisions at an age of 17 or older. This group is not rare given the common school starting age of 6 or 7 and a large fraction of Chinese students repeated one grade or more in primary or middle school.[17] As grade repetition is negatively associated with ability, this group is expected to have lower educational attainment in the absence of the reform. Figure 6 confirms this projection. Thus I cannot be confident about the external validity of the results for early high school deciders. It is likely that these late high school deciders attend high

[16]This rescaling method follows that of Hahn, Todd & Van der Klaauw (2001). When the discontinuity of treatment probability is less than one, they show that the local treatment effect can be estimated by the ratio of the discontinuity in an outcome to the discontinuity in the treatment probability.

[17]According to the Educational Statistics Yearbook of China, the primary and middle school repetition rate in 1990 was 6.1% and 2.2% respectively. The potential fraction of students who ever repeated a grade can be as much as 43.2% if no one repeated more than one grade. In addition, Chen et al. (2010) show that 35% of rural primary school students in Shaanxi province repeated at least one grade using survey data conducted in 2006.

school mainly for the associated urban benefits, and that the 1998 Hukou policy change affected them more than those making high school decisions earlier.

Note again that the "biased-corrected" estimate of 17 percentage points via simple extrapolation may still be biased, thus it only serves as a proxy of the local average treatment effect of the reform. We still thus focus on the reduced form results in the remaining analysis.

4.3 Heterogeneous effect on subgroups

The educational response to the Hukou policy change may differ by gender. Table 2 Column 2 and 3 reports the estimation results for male and female separately using a same bandwidth of 41 months. The estimated reduction in the high school attendance rate is 11.7 percentage point points for males, which is statistically significant and is bigger than the average effect. In contrast, the effect on females is relatively smaller and is no longer statistically significant. This response difference likely reflects a higher value of the urban status to males. One possible explanation for the difference in the value of urban status between genders is that males are more likely to find a job in China and better utilize urban Hukou status. Among those aged 25 and above, the employment rates for male and female are 91% and 77%, respectively.[18] Another possible explanation of males' higher valuation on the urban Hukou stems from the unbalanced sex ratio in contemporary China. Wei & Zhang (2011) show households with a son raise their savings to improve their son's relative attractiveness for marriage. Urban status serves the same purpose. Urban Hukou holders have relatively stable income both during work age and after retirement. Compared to saving or income, Hukou status is easier to observe and serves as a signal of wealth in the dating stage. Thus, males with urban Hukou are more likely to succeed in the highly competitive marriage market.

Heterogeneous effects can also occur between the different urban Hukou locations that one can obtain. As the specific urban benefits depend on the budget of local government, the value of an urban Hukou in a big coastal city is different from obtaining an urban Hukou in a small town in the relatively poorer western China. In order to test this hypothesis, I rank all provinces in China according to their urban per capita income in 1998 and categorize the top 50% as the rich region and the rest as the poor region. I then group individuals into these two regions according to their father's urban Hukou locations. Table 2 Column 4 and 5 shows

[18] Author's calculation according to "China 2000 Population Census Data Assembly", National Bureau of Statistics of China.

the different effects for the two groups. The likelihood of enrolling in high school significantly decreases by 12.6 percentage points for individuals eligible for urban Hukou in relatively rich areas. In contrast, obtaining an urban Hukou in relatively poor areas does not greatly affect one's decision to attend high school.

5. ROBUSTNESS AND VALIDITY

In this section, I first present test results for the underlying assumptions required for a valid RD design and check the robustness of my results to parametric specifications. I then show the main results are not driven by the August-September school enrollment cutoff. I also carry out a placebo test for a group that was not affected by the 1998 Hukou reform to show that the drop in high school attendance rate for the group with a rural mother and an urban father is not likely to be a result of other nationwide policy changes.

5.1 RD Validity

A valid RD design requires a smoothness in potential high school attendance outcomes around the birth month threshold of September 1980 without the intervention of the 1998 Hukou reform (Hahn, Todd & Van der Klaauw, 2001; Porter, 2003). I assess the validity of this assumption in two ways. First, I check for manipulation of the assignment variable (birth month) and possible sorting at the cutoff (Lee, 2008). Because the births of affected individuals occurred years prior to the policy change, the birth months of individuals around the cutoff can hardly be manipulated. Consistent with this argument, the density of birth months around the cutoff date displays no noticeable jump when I plot the number of observations of each birth month in Figure 7. The density smoothness test proposed by McCrary (2008) fails rejection at September 1980, providing additional support for continuous density of birth month.

Second, I check if covariates such as parents' education,[19] number of siblings and gender are smooth at the cutoff.[20] Figure 8 graphically presents the mean value of each covariate in 6 month bins separately with a quadratic fit. The visual evidence shows no significant discontinuity before and after September 1980 for all of these variables. As suggested by Lee & Lemieux (2010), I test the joint significance of

[19] Parents' education are measured by dummy variables for fathers and mothers holding middle school degrees and above, respectively

[20] All these variables are statistically significant at 1% level in the DID regression results reported in Appendix.

all the discontinuities at the threshold in a Seemingly Unrelated Regression (SUR), where each equation regresses one covariate on a threshold dummy, a constant and a fourth order polynomial of birth month. The coefficients of polynomials are allowed to be different on each side of the threshold and errors are allowed to be correlated across equations. I do not find evidence of discontinuity in these covariates. In addition, the main results are also robust to the inclusion of these additional controls as reported in Table 2.

As a further robustness check to the non-parametric results, I also provide results obtained from parametric regressions in Table 5 as suggested by Lee & Card (2008) for RD cases with discrete assignment variables. I estimate the impact of Hukou transfer eligibility on high school attendance with both quadratic and quartic specifications[21] where the coefficient of the polynomials are allowed to differ on either side of the cutoff and the error terms are clustered at the birth month level. The estimated reductions in high school attendance are all similar in magnitude to those obtained from the local linear regressions.

5.2 School enrollment cutoff

The official starting age for compulsory education in China is 6 or 7 years, depending on county policies. Those children who reach the local school starting age before September 1 can enroll in primary school in the same year and those who do not do so have to wait for another year to start school. Children who reach schooling age in September will therefore be older than their classmates while children who reach this age in August will be younger. This age difference due to the school enrollment cutoff may lead to a different performance in school. For example, Dobkin & Ferreira (2010) use U.S, data to find that students who are the youngest in their school cohort have a slightly higher level of educational attainment. However, this may be due to age-based mandatory school attendance laws in U.S.: children starting primary education at earlier ages have to stay enrolled longer before reaching the legal school leaving age of 16.

Unlike the U.S., China has compulsory school laws based on years of schooling and not on age. Europe shares these same features in mandatory school policy and as a consequence research results using European countries' data are more suitable to make inferences for China. Black, Devereux & Salvanes (2011) find no effect of school starting age on educational attainment in Norway and Fertig & Kluve (2005)

[21] Both second and fourth order polynomials pass the goodness-of-fit test proposed by Lee & Card (2008).

observe similar results in Germany.

To further test if the main results of this study are driven by the August-September school enrollment cutoff rule, I run a local linear regression with the same bandwidth of 41 months using the same sample but a different cutoff of September 1976, which is four years before the true cutoff. There is no significant change in the high school enrollment rate at this threshold.[22] The probability jump of high school enrollment at September 1980 is therefore not likely to be caused by the school entry cutoff date.

5.3 Other simultaneous national reforms

Policies in China have changed drastically in the last two decades. One may argue that the drop in high school enrollment is a result of other changes, such as the tuition reform and college expansion in the late 1990s or the rising unemployment rate for college graduates in the 2000s. On average, a cohort born in August enrolls in school and enters the labor market a year earlier than one born in September. These two cohorts may face differences in tuition, school quality and funding, and immediate job market opportunities.

A placebo test for individuals with both parents holding urban Hukou, however, suggests that the reduction in the high school enrollment rate is not caused by other nationwide changes. In theory, such individuals should not be affected by the 1998 Hukou reform since the ability to transfer the status of their Hukou from that of their mother to that of their father did not apply to them. I test for possible discontinuity in their high school attendance at the same threshold of September 1980. If there were other factors only affecting individuals born after September 1980, the high school attendance rate of this placebo group should decrease as well. Nonetheless, the change in the high school enrollment rate at September 1980 is small and not statistically significant for this placebo group.

Note that individuals within the "urban-urban" placebo group are generally from wealthier families than those individuals with a rural mother and an urban father. If the "rural-urban" group is credit constrained and the decreased high school attendance rate is driven by increased tuition, the "urban-urban" group surely would respond less. To test if the reduced high school enrollment is a result of tuition reform, I use an alternative placebo group with both parents holding rural Hukou. Again, I find no significant changes in high school enrollment for this "rural-rural" group. Therefore, the reduction in high school attendance rate for the beneficiaries

[22] The point estimate is 0.026 with a standard error of 0.043.

of the 1998 Hukou reform is not likely to have been caused by other nationwide reforms.

6. DISCUSSION

This study estimates the impact of removing migration selectivity on the education decisions of a subgroup of rural Hukou holders. Compared with a typical rural child whose parents both hold a rural Hukou, individuals with an urban father and a rural mother are more likely to come from an advantaged background and are more likely to have better educated parents, especially fathers, on average.[23] Thus, I cannot be confident about the external validity of the results for typical rural youth. Nonetheless, one conclusion that can be drawn from this study is that the Hukou system creates stronger incentives for at least a significant subgroup of rural Hukou holders to invest in human capital in China. Individuals with a rural mother and an urban father constitute 4.9% of the population which has at least some middle school education. Under the conservative assumption that obtaining urban status only affects the high school attendance of this subgroup, simple calculation shows that a removal of the selective migration restriction in China decreases the transition rate from middle school to high school by 0.4 percentage points. This impact would be much larger if the other rural youth were also affected.

The reduced educational attainment that followed the 1998 Hukou reform does not necessarily disavdantage the affected students. The pre-reform Hukou system introduced additional incentives to pursue post-compulsory education in China. It is reasonable assumed that such distortion has caused over-investment in education as many students usually stay in school longer just to obtain the urban status and associated benefits. In this context, additional schooling is a waste of time if it does not improve students' cognitive skills.[24] A removal of the Hukou restriction then simply brings schooling back to the optimal level.

However, several studies have argued that students are unable to make optimal schooling decisions that maximize their lifetime welfare. There are a number of reasons that adolescents may under-invest in education: a high discount rate of future earnings (e.g. O'Donoghue & Rabin, 1999), culture or peer pressure (e.g. Ak-

[23] I define educated parents as those with at least some middle school education. For children with an urban father and a rural mother, 69% of them have an educated father and 34% have an educated mother according to my data. These proportions drop to 54% and 28%, respectively, for children with both parents holding rural Hukou.

[24] See Hanushek & Woessmann (2008) for a comprehensive discussion of the differences between cognitive skills and school attainment in explaining individual income and economic growth.

erlof & Kranton, 2002), misprediction of future returns, ignorance of non-pecuniary benefits (Oreopoulos, 2007) or credit constraints. Scholars have documented an increase in wages when students were forced to stay in school longer through changes in compulsory education laws (Meghir & Palme, 2005; Oreopoulos, 2006). Additional compulsory schooling also brings non-pecuniary benefits on health, life satisfaction and marriage (Lleras-Muney, 2005; Oreopoulos, 2007). Oreopoulos & Salvanes (2009) further point out an ironic explanation of why students leave school early in spite of high returns: that they lack the decision making skills that more schooling would help improve. All these empirical findings indicate potential underinvestment issues in education. Unfortunately, it is not possible to use my data to test whether this is the case for China as a large proportion of individuals in my sample were still in school.

From society's point of view, the optimal level of schooling also depends on externalities. Economists argue that the social benefits from education may significantly exceed the private benefits given substantial positive externalities of knowledge (Weisbrod, 1962; Acemoglu, 1996, 1998; Lucas Jr, 1988). When taking into account the spill-over effect, social returns may be well above private returns even if the government subsidy is included in the calculation (Psacharopoulos & Patrinos, 2004). This is likely to be the case in China given its low level of education subsidy.[25] Liu (2007) is the first to empirically test for a human capital spill-over effect in China using individual level data. He finds substantial external benefits of an additional year of schooling. These range from an 11% to a 13% increment in wages caused by externalities, which is at least as great as the private benefits. His finding, combined with a low subsidization index[26] of 1.04 to 1.31 in China,[27] implies that the social returns exceed the private returns to education. The social return will be even bigger when taking into account non-pecuniary externalities such as crime reduction, better family decision-making and improved voting behavior (Hanushek, 2002; Lochner & Moretti, 2004). This perception is in line with Heckman (2003)'s argument that China invested too little in human capital when compared to its investment in physical capital. Thus, the additional incentive to stay in school brought by the Hukou system may partially correct the potential underinvestment problem in China.

[25] As one indicator, according to United Nations Educational, Scientific, and Cultural Organization (UNESCO) Institute for Statistics, the Chinese government spent 1.9% of GDP on Education in 1999. This figure is well below the world average of 4.2%.

[26] The index of public subsidization on education shows the ratio of social costs to private costs.

[27] The subsidization indices estimated by Hossain (1997) are 1.25, 1.04 and 1.31 for primary, secondary and higher education respectively.

7. CONCLUSION

This paper provides evidence that removing selective mobility restrictions lowers migrants' educational attainment. Using data from China, I analyze the impact of a removal of selective rural-urban migration restrictions on rural youths' post-compulsory education decisions. I find that directly granting urban residency decreases rural residents' high school attendance rate substantially by 8.8 percentage points.

In order to mitigate the unbalanced development between rural and urban areas in China, a few provinces have used a uniform identity since 2002 to replace the original rural/urban dichotomy. This new policy reform is analogous to the one examined in this paper, which impairs educational outcomes, but on a larger scale. Even though individuals with rural origin are able to enjoy urban benefits instantly, their potential for career development and long-term income may be restricted by limited education.

This paper also helps further understand the challenges faced by countries who have removed or relaxed mobility restrictions. Free migration has been fundamental to the European Union, which has undergone several enlargements since its inception in 1957 (the largest of these in 2004 which incorporated 10 new member countries). Free movement of workers was also introduced between India and Nepal in the 1950s. An integral role would also be played by the free movement of labor in the long-planned and hypothetical North American Union. If mobility restrictions used to be selective, open border policies may have unexpected impact on education.

Given data limitations, I cannot assess the long-term effects of removing migration selectivity. While migrants do receive legal residency and related benefits, their educational attainment is lowered. Are these schooling decisions myopic or optimal in their lives? Post-migration outcomes such as employment perspectives, wage earnings or marriage market performance are important aspects for future research.

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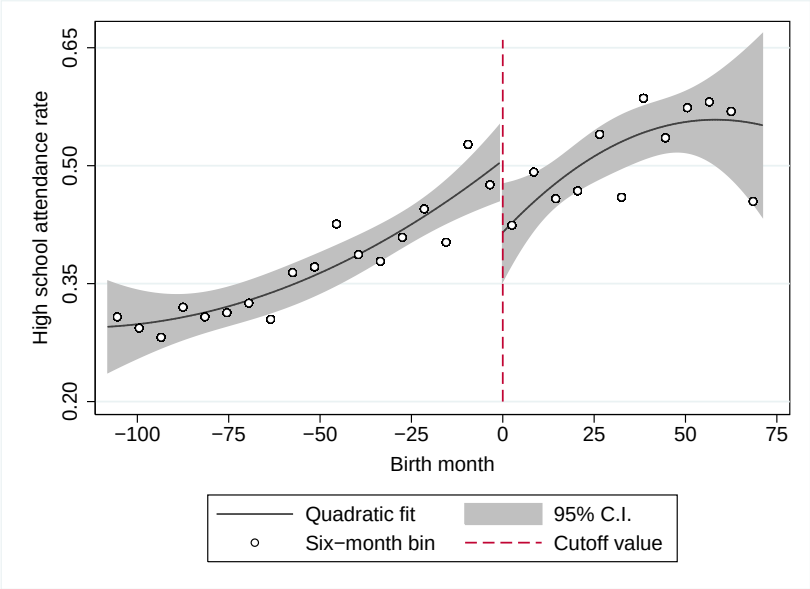
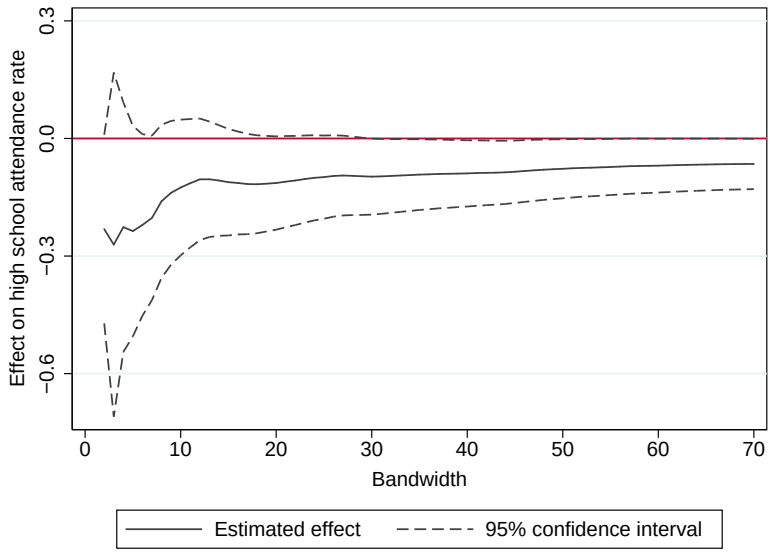
Figure 1: Discontinuity in High School Attendance Rate



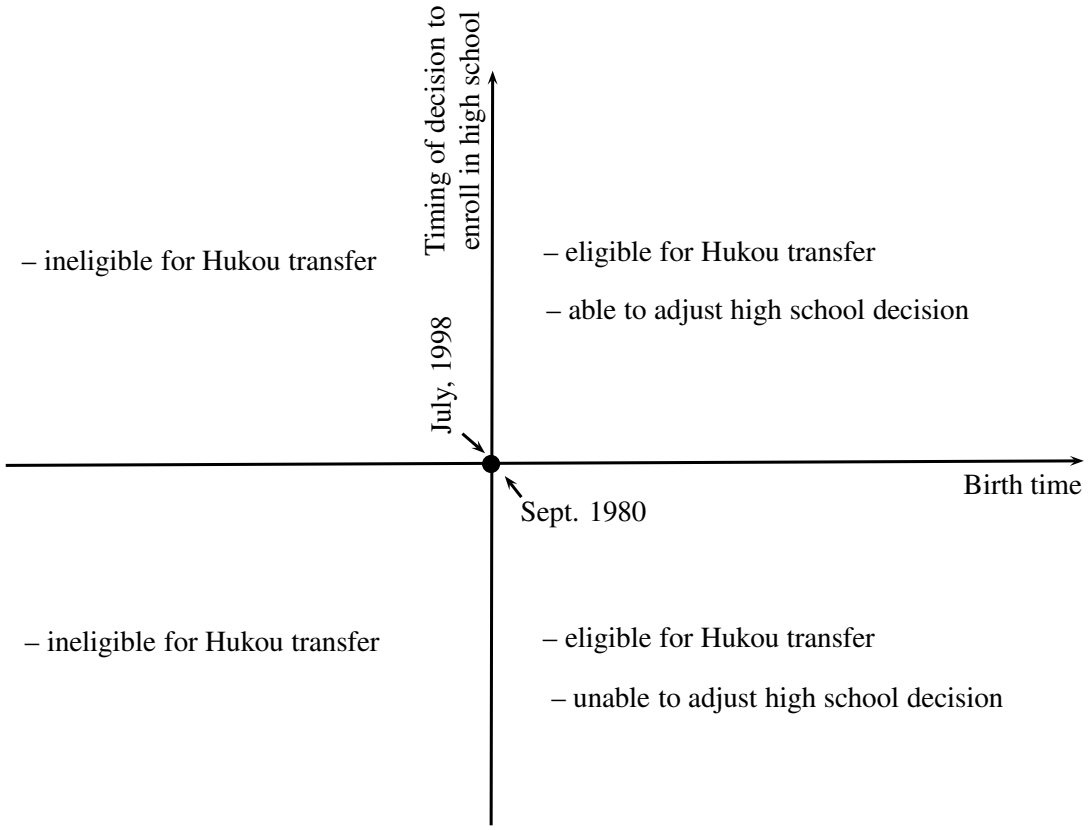
Notes: Figure shows the high school attendance rate for children with a father holding urban Hukou and a mother holding rural Hukou. Sample used here includes individuals born between September 1971 and August 1986 with at least some middle school education. Those still in middle school are excluded. Birth month is normalized with $Sept.1980 = 0$.

Figure 2: Effects on High School Attendance, by varying bandwidths



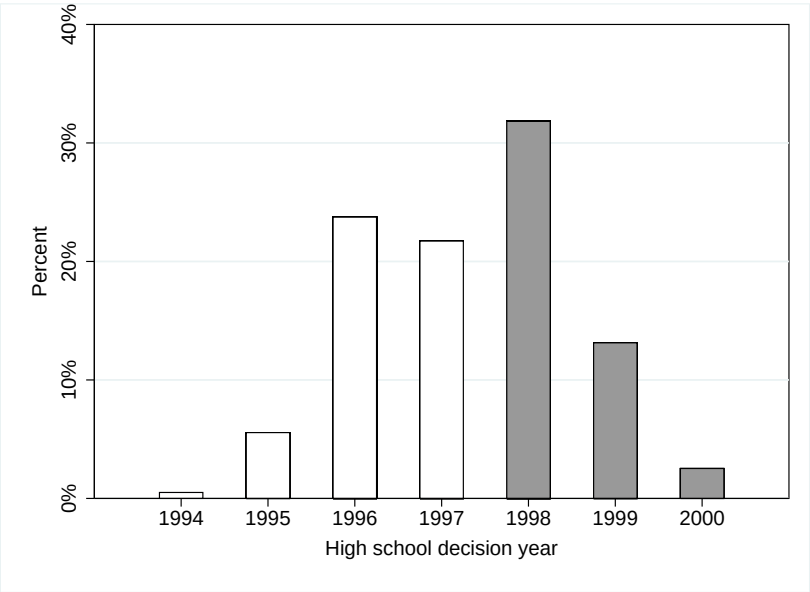
Notes: Figure shows the estimated impact of Hukou transfer eligibility on high school attendance using different bandwidths ranging between 3 to 70 months.

Figure 3: Ability to Adjust High School Decisions in Response to the Reform



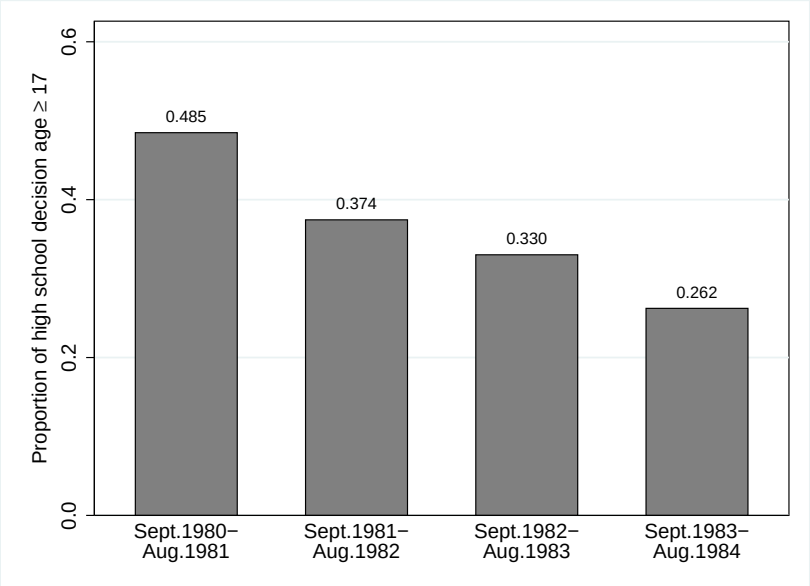
Notes: According to the 1998 Hukou reform, individuals born in or after September 1980 who inherited their mother's Hukou would be eligible to adopt their father's Hukou. Thus, children born in or after September 1980 with a mother holding rural Hukou and a father holding urban Hukou then had the chance to obtain urban status immediately. However, not all eligible individuals' high school enrollment decisions would be affected by this policy change. If the policy change was fully unexpected, only those making high school enrollment decisions after the reform had the chance to adjust their decision according to the new policy.

Figure 4: Distribution of Timing of Decision to Enroll in High School



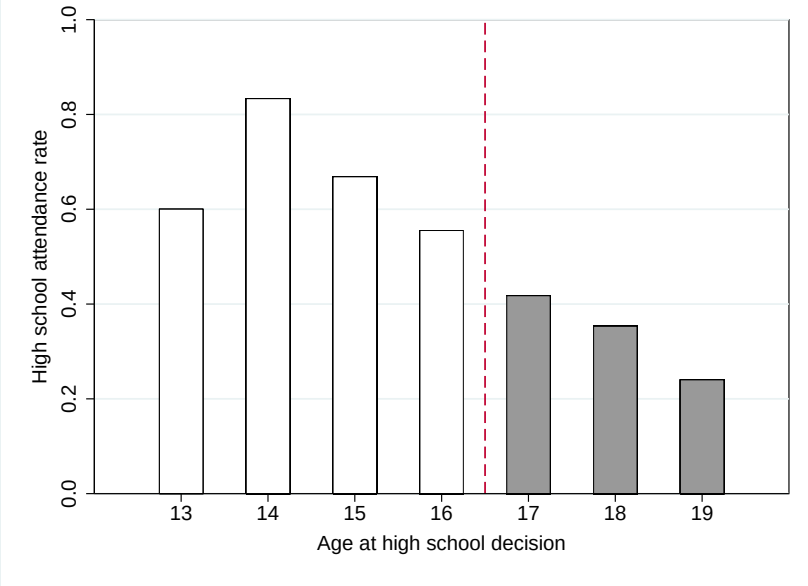
Notes: Figure shows in which year the decision was made to enroll in high school for the cohort born between September 1980 and August 1981. For the purpose of illustration, this distribution is drawn according to the China Health and Nutrition Survey and may thus differ from the distribution for the 2000 census sample. Among all individuals eligible to inherit the urban Hukou status from their fathers, only those making high school enrollment decisions in or after 1998 had the chance to adjust their decisions according to the new policy as indicated in the shaded areas in this graph.

Figure 5: Proportion of High School Decision Age $\geq$ 17 across Cohorts



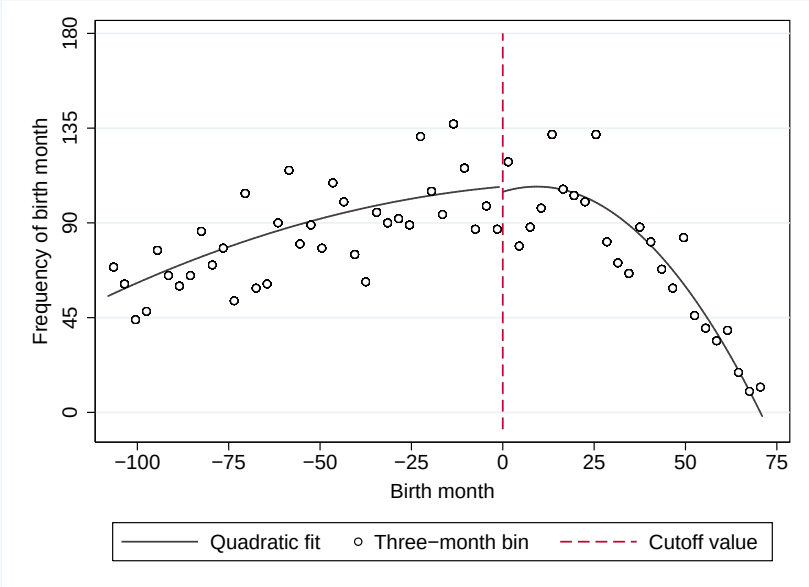
Notes: The figure is based on the China Health and Nutrition Survey. The sample includes all individuals born between September 1980 and August 1984 regardless of their parents' Hukou status.

Figure 6: High School Attendance rate by Age at High School Decision



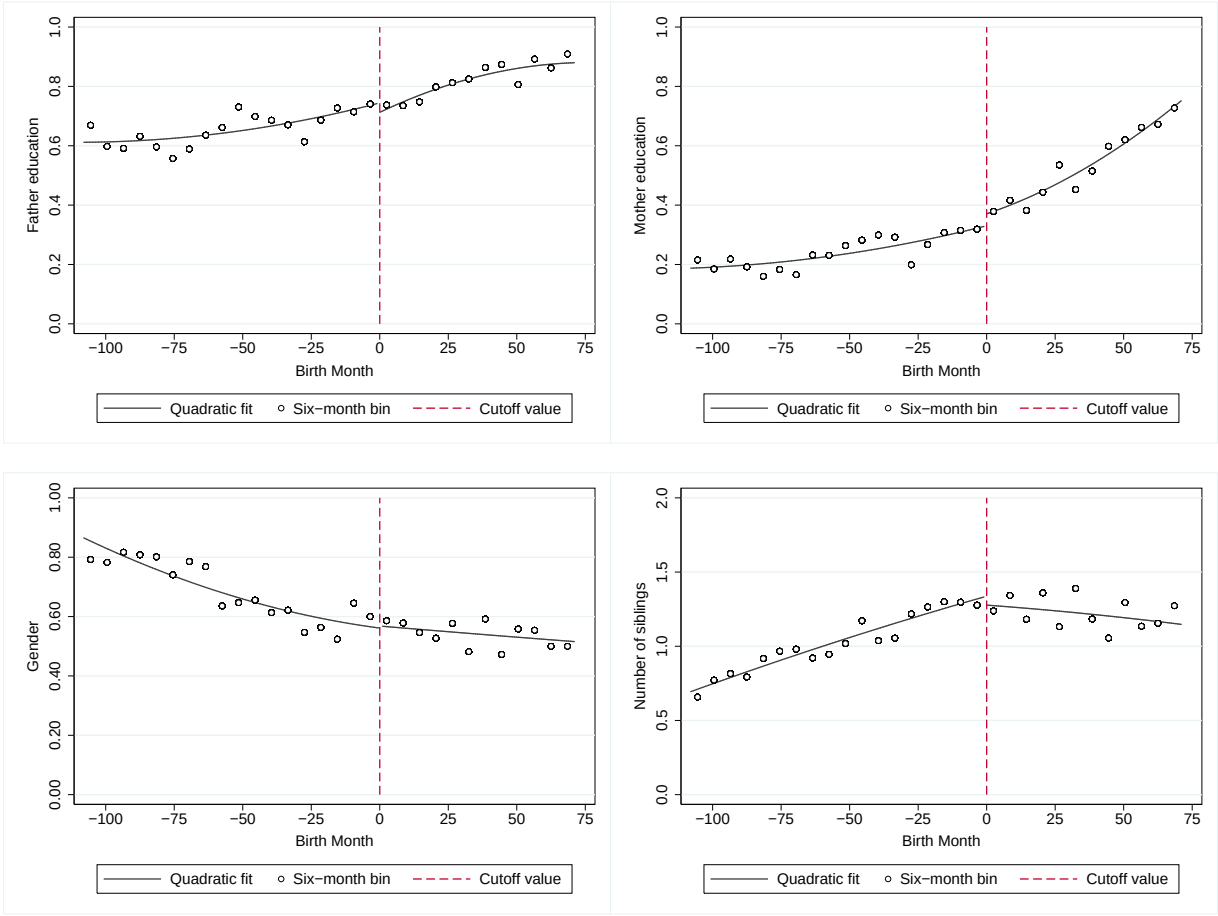
Notes: The figure is based on the China Health and Nutrition Survey. The sample includes all individuals born between September 1980 and August 1984 regardless of their parents' Hukou status.

Figure 7: Density Continuity for Birth Month



Notes: Figure shows the birth month density for children with a rural mother and an urban father. Birth month is normalized with $Sept.1980 = 0$. Sample includes individuals born between September 1971 and August 1986 with at least middle school education. Those still in middle school are excluded.

Figure 8: Covariates Continuity



Notes: Figure shows continuity in covariates for the high school attendance analysis for the group with a rural mother and an urban father. Sample used here includes individuals born between September 1971 and August 1986 with at least some middle school education. Those still in middle school are excluded. Birth month is normalized with $Sept.1980 = 0$.

Table 1: Summary Statistics

SAMPLE/VARIABLE	MEAN	STANDARD DEV.	N
Educational outcomes			
High school attendance rate	0.43	(0.49)	4772
Regular high school attendance rate	0.29	(0.45)	4772
Technical high school attendance rate	0.14	(0.34)	4772
Personal characteristics			
Father education (middle school and above)	0.71	(0.45)	4772
Mother education (middle school and above)	0.34	(0.47)	4772
Gender (male=1)	0.63	(0.48)	4772
Number of siblings	1.13	(0.99)	4606

Note: Data are drawn from the 0.095% sample of the 2000 census. The subsample used in this study consists of individuals born between September 1971 and August 1986 with a father holding urban Hukou and a mother holding rural Hukou. I exclude respondents with an education level lower than middle school and those still in middle school.

Table 2: Reform Impact on High School Attendance Rate

		By Gender		By Region	
	All	Male	Female	Rich	Poor
Without controls	-0.088**	-0.117**	-0.054	-0.126**	-0.049
	(0.043)	(0.055)	(0.067)	(0.059)	(0.061)
N	2655	1510	1145	1366	1289
With controls	-0.087**	-0.104*	-0.067	-0.137**	-0.037
	(0.041)	(0.054)	(0.063)	(0.057)	(0.059)
N	2639	1503	1136	1355	1284
Bandwidth (months)	41	41	41	41	41

Note: Table shows the estimated discontinuity in the high school attendance rate at the eligibility birth month threshold of September 1980. The sample is restricted to individuals with at least some middle school education, excluding those still in middle school. Asterisks *, ** and *** denote significant levels of 10%, 5% and 1% respectively.

Table 3: Reform Impact on High School Attendance Rate by School Type

	Regular High School		Technical High School	
Reform Impact	0.000	0.002	-0.088***	-0.088***
	(0.038)	(0.038)	(0.034)	(0.034)
Controls	No	Yes	No	Yes
Bandwidth (months)	41	41	41	41
N	2655	2639	2655	2639

Note: Table shows the estimated discontinuity in regular and technical high school attendance rates at the eligibility birth month threshold of September 1980. The sample is restricted to individuals with at least some middle school education, excluding those still in middle school. Asterisks *, ** and *** denote significant levels of 10%, 5% and 1% respectively.

Table 4: Reform Impact on Middle School Graduation Rate

	Middle School Graduation Rate	
Reform Impact	-0.008	-0.009
	(0.011)	(0.011)
Controls	No	Yes
Bandwidth (months)	41	41
N	2655	2639

Note: Table shows the estimated discontinuity in the middle school graduation rate at the eligibility birth month threshold of September 1980. The sample is restricted to individuals with at least some middle school education, excluding those still in middle school. Asterisks *, ** and *** denote significant levels of 10%, 5% and 1% respectively.

Table 5: High School Attendance Rate (Parametric Specifications)

	Quadratic		Quartic	
	No Controls	With Controls	No Controls	With Controls
Sample	(1)	(2)	(3)	(4)
All	-0.092**	-0.087**	-0.127**	-0.131***
	(0.037)	(0.035)	(0.054)	(0.049)
By Gender				
Male	-0.116**	-0.103**	-0.163**	-0.166**
	(0.049)	(0.047)	(0.074)	(0.071)
Female	-0.060	-0.067	-0.077	-0.090
	(0.066)	(0.062)	(0.101)	(0.093)
By Region				
Rich	-0.115**	-0.123**	-0.129*	-0.158**
	(0.054)	(0.053)	(0.076)	(0.069)
Poor	-0.061	-0.047	-0.127*	-0.107
	(0.053)	(0.053)	(0.076)	(0.078)

Note: Table shows the estimated discontinuity in the high school attendance rate at the eligibility birth month threshold of September 1980 using various of parametric specifications. Standard errors are clustered at the birth month level. Asterisks *, ** and *** denote significant levels of 10%, 5% and 1% respectively.

Appendices

DIFFERENCE IN DIFFERENCES ESTIMATION

According to the Hukou reform of 1998, children who were under the age of 18 in September 1998 and had followed their mother's Hukou then had the chance to change their status according to their father's Hukou. Therefore, those born in or after September 1980 with their mother holding rural Hukou and their father holding urban are beneficiaries of this reform. Nevertheless, their high school attendance decisions would only be affected if they were made after the reform, assuming that the 1998 Hukou policy change is fully unexpected.

The fraction of beneficiaries varies across different birth cohorts. The majority of Chinese students finish middle school at actual ages between 15 and 17, where the actual age is defined as the age at one's last birthday.[28] In the following analysis, I use a census sub-sample consisting of those born between September 1979 and August 1983 with at least some middle school education. The 1998 Hukou reform affected the high school decisions of most of the Sept.1982-Aug.1983 cohort (hereafter referred to as "1982-1983" cohort), part of the Sept.1980-Sept.1981 and Sept.1981-Sept.1982 cohorts (hereafter referred to as "1980-1981" and "1981-1982" cohort), and none of those born between September 1979 and August 1980 (subsequently referred to as "1979-1980" cohort). The effect of policy change could be identified by comparing high school attendance rates of the cohort born in the first academic year in the sub-sample and of those born in the last.

I use a difference in differences strategy to estimate the impact of obtaining urban Hukou on high school attendance. The control group includes children born between September 1979 and August 1983 who have both parents holding urban Hukou and who should not be affected by the 1998 Hukou reform. I also include year dummies and province dummies as additional controls. As shown in Figure A.1, the high school enrollment gap between the treatment and control groups increased from around 26 percentage points to 35 percentage points across birth years.

I estimate the effect of obtaining urban Hukou on education using the following

[28] For example, the actual age of a child born in September 1, 1980 is 17 on any date between September 1, 1997 and August 31, 1998. His/her actual age reaches 18 on September 1, 1998.

regression model:

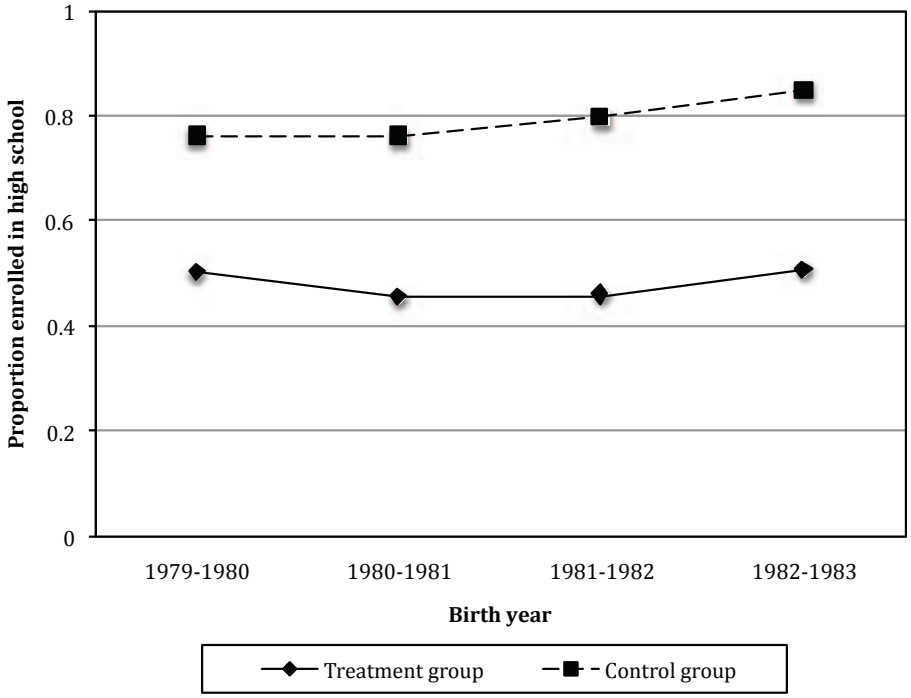
$$Y_{itj} = \alpha \times \sum t_i + \beta * \sum (t_i \times I_i(j = rural)) + \gamma \times I_i(M = rural) + \eta \times \sum PROV_I + \delta \times x_{itj} + \epsilon_{itj}, \quad \text{(A.1)}$$

where t_is are birth cohort dummies indicating if individual i belongs to 1979-1980, 1980-1981, 1981-1982 or 1982-1983 cohort with the oldest cohort as default, Y_{itj} is a binary variable taking the value of one if individual i of cohort t whose mother's Hukou type is j attends high school and zero otherwise, I_i is an indicator function taking the value of 1 if the mother of individual i holds rural Hukou and zero otherwise, $PROV_i$ is a set of province dummies of high school entrance exam locations for individual i, capturing variation in the level of competition in high school admission across provinces, and X_{itj} is a vector of individual characteristics including gender, minority status, number of siblings, parent's education and occupation of father. The interaction term $\sum(t_i \times I(j = rural))$ for t_i=1982-1983 is the variable of interest. Its coefficient captures the effect of the policy change on high school decision. I estimate equation (A.1) using OLS, Probit and semi-parametric Klein and Spady estimator.

As shown in Table A.1, all three methods show a significant reduction of 7.4 to 10 percentage points in the high school attendance rate for rural individuals eligible for the urban status. These results are consistent with those obtained from the regression discontinuity design in general, although the magnitude of the difference in differences estimates lies around the reduced form effect estimated by the regression discontinuity design. To be unbiased, the difference in differences estimator requires the assumption that the time trends in high school attendance rate are the same for individuals with a rural mother and an urban father and those with both parents holding urban Hukou. If this assumption does not hold, the difference in differences estimates may diverge from the regression discontinuity estimates.[29]

[29] See Lemieux & Milligan (2008) for a detailed comparison of the estimation results obtained from these two methods.

Figure A.1: High School Attendance Rate by Birth Year



Notes: The treatment group consists of individuals with a rural mother and an urban father. The control group consists of individuals with both parents holding urban Hukou. Cohorts are grouped by academic years instead of calendar years. Eg. 1979-1980 denotes Sept. 1979 to Aug. 1980.

Table A.1: Estimation Results of Difference in Differences Approach

	OLS	PROBIT		KLEIN & SPADY
	(1)	(2)	(3)	(4)
Y82-83*treatment	-0.074*	-0.321***	-0.097	-0.100
	(0.041)	(0.119)	—	—
Controls	Yes	Yes		Yes
N	8478	8477		8478
(Pseudo) R^2	0.204	0.200		—

Notes: Coefficients reported in Column 3 are calculated marginal effect for corresponding Probit model. Asterisks *, ** and *** denote significant levels of 10%, 5% and 1% respectively.