The Effect of Age at School Entry on Educational Attainment and Labor Market Outcomes: Evidence from China

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December 2017

< Preliminary and incomplete draft: Please do not quote or cite >

Abstract

The long-term economic impact of children's age at primary school entry is one of the primary concerns to policy-makers, educators, and families. Using China Family Panel Studies (CFPS), this paper is the first to explore these effects in the Chinese context with a regression discontinuity design, employing the threshold date for primary school entrance set by the 1986 Compulsory Education Law of China as a source of exogenous variation in the timing of school entry. First, this paper documents weak compliance with the school entry legislation. Individuals born just after the threshold date, are only 0.29 years older at school entry than their earlier born counterparts, whereas the predicted difference with perfect compliance is nearly one year. We find a significant effect on years of schooling using the full sample, with individuals born right after the threshold attaining 0.55 more completed years of schooling on average. Positive effect of delayed school enrollment on educational attainment is also significant for subsample with agricultural *Hukou* status. However, there is no evidence that school entry age affects labor market outcomes, such as personal income and probability of employment, in adulthood.

JEL Codes: I21, I26, J24

Keywords: Age at School Entry, Educational Attainment, Labor Market Outcomes

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1. Introduction

A key element in human capital investments for parents and policy makers to consider is at what age children should begin primary school. When making school enrollment decisions, parents from different countries often hold distinct views. In the United States, for example, the average entry age to kindergarten has been rising over the past few decades (Elder and Lubotsky, 2009) largely due to parents of children born prior to the school entry cutoff voluntarily postponing the school entrance of their children for a year. Quite the contrary, in many developing countries, such as China, most parents believe the old saying that "early bird catches the worm", and have been increasingly seeking to advance the enrollment year for their children, even violating the school entry law through bribery and social connections. Figure 1 shows that the average age at primary school entry in China has been constantly declining for more recent birth cohorts. The downward trend stems from both changes in voluntary decisions and variations in national and local legislations. It is quite possible that because of differences in culture and social structure, the effect of school entrance age in China substantially differs from that in the US, justifying parents' opposite behaviors in making enrollment decisions. However, little empirical evidence on the effects of school entry age, especially its long-term impacts, has been provided for China. In this paper, we investigate the effect of age at primary school entrance on educational attainment and labor market outcomes in the Chinese context. It is the first to investigate these long-term effects for China.

< Figure 1 about here >

There has been a plethora of studies examining the short-term effects of the school entry age on the academic performance of school-age children, the impacts on their labor market outcomes in adulthood, however, are largely understudied even in developed countries. These long-term effects are, in theory, ambiguous. On the one hand, the youngest students in a class are found to have higher educational attainment compared to older peers in the same cohort (Angrist and Krueger, 1991; Dobkin and Ferreira, 2000; Mayer and Knutson, 1999), and therefore are likely to earn higher income when reaching adulthood. On the other hand, enrolling children as soon as they are eligible may negatively affect their academic performance in school (Bedard and Dhuey, 2006**;** Datar, 2006**;** Elder and Lubotsky, 2009**;** Uphoff and Gilmore, 1985). Because younger students, with lower initial stock of skills at school entry, may not be mature and

malleable enough to effectively accumulate further skills from primary education, especially during early grades. Consequently, these early entrants to primary school may end up with lower earnings given the same educational attainment.

China had never established formal regulations on school entry until the passage of the 1986 Compulsory Education Law. Prior to 1986, the school entry age usually ranged from 7 to 11. This national law requires that any children who have reached the age of 6 (or the age of 7 in less developed areas) by August 31st of a calendar year should enter primary school in that year to finish the nine-year compulsory education. This implies that children who are born after this threshold date in a calendar year are normally held out of elementary school until the next September. The legislation explains the dramatic drop in the school entry age among those born in the early 1980s as shown in Figure 1. Our study takes advantage of the exogenous variation in school entry age generated by the threshold date for school entry within a regression discontinuity (RD) framework. Specifically, we employ a two-step procedure using data from the China Family Panel Studies (CFPS). The RD design lets us estimate the causal impact of the school entry age by comparing individuals who were born right before and after the threshold date.

We document three key findings:

(1) The first-stage estimates indicate a weak enforcement of the law- individuals born just after the threshold date, on average, are only 0.29 years older at school entry than their earlier born counterparts (as opposed to nearly a year under perfect compliance).

(2) School entry age significantly affect educational attainment in adulthood. Later entrance into primary school results in 0.55 more completed years of schooling. Separate estimation by *Hukou* (house registration) status at age 3 shows a similar 0.58 years' discontinuity for agricultural registered sample, whereas the result is not significant for those with non-agricultural *Hukou* status.

(3) Whether separating by demographic groups or regional groups, there is no evidence that the school entry age affects labor market outcomes, such as employment and earnings.

To our knowledge, this paper is the first to use the threshold date for school entry required by 1986 Compulsory Education Law to estimate how school entry age influences educational attainment and labor market outcomes in China. One recent study on Chinese educational equity argues that setting a threshold date and taking the age of 6 as the unified school age violate the

fairness of education (Yang and Huang, 2016). Our paper provides new insights into this "one size fits all" admission policy for parents, educators and legislators. Another contribution of this study is that it estimates the long-term effects on educational attainment and labor market outcomes, which are presumably of greater interest than short-term outcomes such as academic performance.

2. Literature Review

Since the pioneering analysis of human capital by Gary Becker (1962; 1964), the returns to education have been studied extensively under different contexts. Our study is based on the framework that school entrance age will affect education in both the short-term academic achievement and long-term completed years of schooling, which are also the two potential mechanisms through which the labor market outcomes can be affected. The conceptual framework is supported by existing literature.

The first channel linking school entrance age and labor market outcomes is the in-school academic performance. Cunha et al. (2006) states that economic returns to initial investments at early ages are higher compared to those at older ages, and suggest a strong skill multiplier effect of early investment. Early exposure to learning could help children with the same amount of schooling achieve more cognitive skills, thereby increasing productivity and wages in the long run. Mayer and Knutson (1999) find that younger children have higher test scores and less behavioral problems compared to older ones with same years of schooling. They additionally show that when holding education constant, a one standard deviation increase in test scores is associated with 7.5 percent higher weekly wages on average. Contrary effects are also found in other studies. Uphoff and Gilmore (1985) point out that older children are more likely to score above the average and less likely to be held back a grade. Datar (2006) documents that delaying kindergarten entrance increases test scores not only at kindergarten entry but also during the first 2 years in school, and argues that higher test scores at graduation may provide higher wages. Elder and Lubotsky (2009) provide similar conclusion that being one year older at the beginning of kindergarten leads to an increase in test scores, except that these achievement gaps tend to fade away as children progress through school. This finding corroborates the notion that there are no long-term beneficial effects on earnings from entering kindergarten at an older age.

The other, and more important, channel is through educational attainment. Children enrolled at a younger age are able to attain more years of schooling since they are required to stay in school longer until reaching the minimum lawful dropout age. An influential paper written by Angrist and Krueger (1991) finds that those who are required to attend school longer by the compulsory schooling laws have higher wages because they have obtained extra schooling. Mayer and Knutson (1999), following the strategy used by Angrist and Krueger, provide a similar argument that children enrolling earlier get more schooling, and the increase in earnings can be partly attributed to additional education. However, the exact opposite may be happening: older students in a cohort have higher educational attainment. Winship and Korenman (1999) state that individuals with greater early cognitive skills are more likely to attain more schoolings, and that schooling raises individuals' later cognitive ability. They examine the independent and composite effects of schooling and cognitive skills on family income and annual earnings, and claim that the interaction between these two channels yields a multiplier effect.

While the studies discussed above has extensively documented how being the youngest student in a class affects performance and educational attainment, the literature on the impact on labor market outcomes is limited and less conclusive. In terms of the U.S. education system, Angrist and Krueger (1991) and Mayer and Knutson (1999) find that starting school at a younger age leads to higher wages, while Dobkin and Ferreira (2000) document no statistically significant effect. There have been critiques on using season of birth as an instrument because salient seasonal changes are documented in the characteristics of mothers giving births throughout the year in the United States (Buckles and Hungerman, 2010). For countries without legal minimum dropout age requirement, such as Norway[2], Black et al. (2011) found positive earning effect at age 20s for being younger at school. Additionally, Fredriksson et al. (2006) and Zweimüller (2013) separately show negative earning effect for cohorts born after 1965 in Sweden, and young adults with no work experience before in Austria. Pohkonen (2015) concludes no effect for the Finnish scenario.

Most pertinent to this paper are those country-level studies by Dobkin and Ferreira (2010) for the United States, Black, Devereux and Salvanes (2011) for Norway, and Fredriksson and Öckert (2006) for Sweden. Dobkin and Ferreira (2010) exploit the case in Texas and California

[2] Compulsory primary and lower secondary schooling in Norway lasts for ten years and children start school the year they become six. Swedish compulsory schooling consists of three stages and nine years in total. It is mandatory for pupils in Austria and Finland to complete nine years of school.

where the threshold date for children being at least five years old to enroll in kindergarten is September 1st and December 2nd respectively. Making use of these dates, they employ a regression discontinuity framework to estimate the effect of the school entry laws on educational attainment, wages and employment. It is concluded that students that enroll in school at a younger age have slightly higher educational attainment. However, there is no evidence that school entry age would affect wages or employment. They argue that this might be because the positive impact of relative age on educational attainment offsets the negative impact on academic performance.

The research conducted by Black, Devereux and Salvanes (2011) is very similar to Fredriksson and Öckert's work. They attempt to examine the effect of school starting age within a cohort over time on long-term outcomes such as adult earnings and completed years of schooling with Norwegian Registry Data. Children must start school in the calendar year they turn the age of 7, and the threshold date for school entry is January 1st. They use the same instrument as used in Fredriksson and Öckert's empirical strategy for the actual starting age. It is concluded that starting school at older ages has little impact on educational attainment, but induces lower earnings. The negative effect on earnings fades away and becomes insignificant when people are getting older in their 30s.

To our knowledge, only one economic paper has ever studied the effect of school starting age in the Chinese context. A master's thesis, Chen (2016), investigates the causal impact of delayed enrollment on educational attainment in China using a difference-in-difference (DID) approach: the difference in school entry age between those born before and after the cutoff date should be greater for the post-1986 school entry cohort than those entering school before 1986. The paper documents an adverse relationship between age at school enrollment and high school attendance. Our paper has two major advantages over Chen (2016): first, our RD research method is presumably a more plausible identification strategy because the DID approach conducted by Chen (2016) rests on an untestable common-trend assumption— an individual only has one unique school entrance age whose counterfactual, the entrance age in the absence of the compulsory schooling law, is unobserved. Second, in addition to educational attainment, we also examine the effects on labor market outcomes.

3. Institutional Background

3.1 China's Educational System

China has the largest educational system in the world with almost 260 million young people enrolled and 15 million teachers employed in about 514,000 schools at or below the undergraduate level.[3] The educational system in China is composed of four stages: preschool, primary, secondary and postsecondary. Children usually enroll in pre-schools or kindergartens at the age of two or three, and many of these schools are privately owned. Primary school education are typically started at age six (or seven in less developed areas), and mostly span six years (although some schools still provide five-year cycle for primary school). Primary schooling is followed by secondary education, which consists of two parts: junior secondary education and senior secondary education. Junior secondary education normally requires three years of study, together with the six years in primary school, constituting the nine-year compulsory education. After finishing compulsory education, students could choose whether to enter three-year senior secondary schools such as general (academic) senior secondary (known as *putong gaozhong*), vocational senior secondary (known as *zhongzhuan*), or technical secondary (known as *jixiao*). Postsecondary education, or higher education as it is usually called, includes three levels: bachelor's degrees, master's degrees and doctoral degrees. Undergraduate degrees last four years, and are followed by two to three years of study in master's degrees. The completion of a master's degree is required for admission to a doctoral program, which takes three to five years to complete depending on the majors.

Students are admitted to senior secondary schools based on their test scores in a city-level entrance exam named *Zhongkao*. Acceptances to undergraduate programs entirely depend on test scores in the National College Entrance Examination, known as *gaokao*. Admissions to graduate programs are also commonly determined by grades on a series of entrance exams, administered either at the national level or by the corresponding programs.

3.2 The Compulsory Education Law in China

The Compulsory Education Law in China took effect on July 1, 1986, and was amended at the 22nd Session of the Standing Committee of the Tenth National People's Congress (NPC) on

[3] See OECD. (2016). Education in China: A Snapshot. Available at https://www.oecd.org/china/Education-in-China-a-snapshot.pdf.

June 29, 2006, and the 14th Session of the Standing Committee of the Twelfth NPC on April 24, 2015.[4] It creates a system of 9-year compulsory education across the whole country, which does not charge any tuition or miscellaneous fees.[5] Article 11 of the Law states that, "Any child who has attained to the age of 6, his/her parents or other statutory guardians shall have him/her enrolled in school to finish compulsory education. For the children in those areas where the conditions are not satisfied, the initial time of the schooling may be postponed to 7 years old." According to the interpretation of Article 11 from Legislative Affairs Commission of the NPC Standing Committee, children reaching age 6 by August 31st should enroll in the primary school.[6] We further confirm the threshold date requirement with the Ministry of Education of China. A recent document from the General Office of the Ministry of Education considers children under age 6 before August 31st of that year "underage for primary school enrollments".[7] We also contacted the Department of Education for municipalities and provinces, and assure that August 31st is the threshold date for primary school entry. The actual implementation date of the Compulsory Education Law variates by province or municipalities, which is shown in Table 1. The majority of them implemented the Law from 1986-1988. And generally, the first birth cohort affected by the Law are those born after 1980.

< Table 1 about here >

3.3 The Hukou System in China

Hukou is the system of house registration and social identity that origins in ancient China and functions for population management. Contemporary *Hukou* records resident's identifying information from birth such as name, date of birth, family relations and address. Based on the place of residency (rural or urban) and kinship at birth, individual's *Hukou* status can be either agricultural or non-agricultural. For example, if a child was born in the urban area while both of his parents have agricultural *Hukou* status, then he will have an agricultural *Hukou*. Difference in *Hukou* status also marks the different social benefits an individual has, ranging from education, health insurance, retirement pension to land use right. For education, schools usually give priority of enrollment to children with a local *Hukou*. As a result, the majority of children with

[4] See http://www.gov.cn/flfg/2006-06/30/content_323302.htm, and http://news.xinhuanet.com/politics/2015-04/24/c_1115085400.htm.
[5] See http://www.moe.edu.cn/publicfiles/business/htmlfiles/moe/moe_2803/200907/49979.html.
[6] Chunying Xin. (2012). The Interpretation of Compulsory Education Law of the People's Republic of China (中华人民共和国义务教育法释义).
[7] See http://www.moe.edu.cn/srcsite/A06/jcys_xjgl/201606/t20160627_269836.html.

agricultural *Hukou* status reside in rural areas for their local education, even though their parents could be migrant workers in cities. As inequalities of education exist between rural and urban areas, in the later estimation, we also look at heterogeneous results based on agricultural and non-agricultural *Hukou* status of individuals.

4. Data and Descriptive Statistics

The data we use is China Family Panel Studies (CFPS), which is a nationally representative, annual longitudinal survey of Chinese families and individuals conducted by the Institute of Social Science Survey (ISSS) of Peking University, China. The baseline survey was launched in 2010, with three waves of full sample follow-up surveys implemented in 2012, 2014, and 2016. The CFPS baseline sample covers 25 provinces, representing 95% of the Chinese population. A total of 14,960 households and 42,590 individuals was interviewed in the 2010 baseline survey.[8]

The biggest advantage of CFPS data is that it provides information on each individual's birth year and birth month, as well as their primary school entry year. Accordingly, we are able to deduce each person's actual primary school entry age by subtracting birth year from entry year. Other individual characteristics at birth include province of birth, *Hukou* status, parental educational attainment, gender, and ethnicity.[9] Time-varying demographic characteristics were also collected at the time of the survey, such as whether enrolled in school, age, marital status, urbanicity, and current *Hukou* status. For each individual, we observe both highest level of education they have achieved, and their employment and income information such as their employment status, the after-tax wage of their main job last year, and total personal income last year.

We use wave 2012 in our analysis, which has a sample size of 35,719 for adults.[10] We keep those birth cohorts who were affected by the 1986 Compulsory Education Law based on the

[8] For more details about CFPS dataset, see http://www.isss.pku.edu.cn/cfps/EN/ for official website and http://www.isss.pku.edu.cn/cfps/d/file/p/dc865c7f22a353eade26a534eedf92ba.pdf for latest version of user's manual.
[9] Due to data limitation, we use *Hukou* status at age 3 as a proxy for *Hukou* status at birth. Also, highest level of education completed by parents when individuals were 14 is used to approximate parents' education levels at birth.
[10] There are two reasons why we choose to use wave 2012 only. First, we have more observations to use in our analysis in wave 2012 compared to other waves after cleaning the data. Second, wave 2012 provides parental information when individuals were at age 14.

actual implementation date for each province.[11] Furthermore, we restrict the sample to individuals over age 21 because most of the respondents in the data have completed their education by then. To address concerns about reporting and measurement errors in actual primary school entry age, we also eliminate the less than 2 percent of individuals with entry age younger than 4 or older than 9. Our final sample consists of 4,029 individuals born in the period between 1979 and 1992.

According to the national Compulsory Education Law, when children have reached the age of 6, their parents shall send them to school to receive and complete compulsory education.[12] Below gives an example to gain a better understanding of this article. If a person born in August complies with the law, he or she could enter primary school at age 6.08.[13] However, a complier born in September has to wait until next year and then enter the primary school because he or she doesn't attain to age of 6 by August 31st in that calendar year. Therefore, the entry age for this counterpart person is at exactly age 7. Following the same logic, the dashed line in Figure 2 shows how predicted school entry ages trend by birth month based on this law requirement.

< Figure 2 about here >

Unfortunately, the actual primary school entry age for each individual is not directly reported in our data. However, we can manually calculate the entry age by using information on birth year and birth month, as well as each person's primary school entry year.[14] The formula we use to calculate the precise actual entry age is:

$$Entry\_Age_i = (Entry\_Year_i - Birth\_Year_i) + \left(\frac{9 - Birth\_Month_i}{12}\right)$$

where $Entry\_Age_i$ is the precise actual primary school entry age for individual i, $Entry\_Year_i$ is the primary school entry year, $Birth\_Year_i$ is the birth year, and $Birth\_Month_i$ is the birth month. For instance, if a person was born in October 1980 and entered primary school in 1987, then her actual entry age is equal to: $(1987 - 1980) + \left(\frac{9-10}{12}\right) \approx 6.92$. We plot the calculated average actual primary school entry age by birth month, and connect them using solid line as

[11] Please refer to Table 1 for more details about the actual implementation date of Compulsory Education Law by province.
[12] See http://old.moe.gov.cn/publicfiles/business/htmlfiles/moe/moe_2803/200907/49979.html and http://www.npc.gov.cn/englishnpc/Law/2007-12/12/content_1383936.htm.
[13] 6.08 is calculated based on: $6 + \frac{9-8}{12}$.
[14] In China, the school year for primary education generally starts on September 1st.

shown in Figure 2.[15] This line in essence provides a view of the first-stage figure—the relationship between the actual age at primary school entry (which is the outcome variable in the first-stage regression) and birth month (which is the running variable).

Table 2 reports the summary statistics of the key variables used in the paper for the whole sample. Panel A describes the key dependent variables we are interested in. The average primary school entry age is about 7.2, with standard deviation of 0.9. Individuals complete 10.3 years of schooling, indicating that they just finish junior high school on average. Personal annual income and current employment status are the main labor market outcomes of interest. People on average earn 19,755 RMBs, of whom 67% are currently employed.

< Table 2 about here >

Panel B of Table 2 shows descriptive statistics for individual predetermined characteristics and time-varying demographics. 85% of the sample have agricultural *Hukou* at age 3; however, this fraction decreases to 72% at the time of survey. Years of schooling completed for fathers and mothers are 7.7 and 5.7 respectively, which is consistent with the fact that a majority of people in our sample are inherited agricultural *Hukou* at childhood. Almost everyone belongs to Han ethnicity (94%).[16] Finally, half of adults in our sample are female, and half are residing in urban areas.

5. Empirical Methods

In this section, we discuss the identification strategy and empirical models used to identify the long-term impact of primary school entry age. Our main aim is to examine how age at primary school entry would affect educational attainment and labor market outcomes in adulthood. In the first step, we estimate OLS model with a set of control variables:

$$Y_i = \pi_0 + \pi_1 Entry\_Age_i + \delta X_i + \mu_i \quad (1)$$

[15] The pattern of this line is consistent with the findings of Chen (2016).

[16] There are 56 ethnic groups in China, among which Han has the largest population. Based on 2010 Population Census Data, the Han majority represents 91.6% of the total population, the remaining 8.4% being composed of 55 ethnic minorities. See http://english.gov.cn/archive/china_abc/2014/08/27/content_281474983873388.htm and http://www.stats.gov.cn/tjsj/pcsj/rkpc/6rp/indexch.htm for more details.

where i indexes individuals. Y_i denotes the long-term outcomes including years of schooling completed, personal annual income, and probability of employment for individual i. $Entry\_Age_i$ is a continuous variable of the actual primary school entry age. X_i is a set of control variables such as birth year fixed effects, birth region fixed effects, *Hukou* status at age 3, parental education, gender, and ethnicity. μ_i is an error term with mean zero, which represents unobservable factors affecting dependent variable. The coefficient of interest in the baseline OLS regression is π_1.

Interpreting an OLS estimate of π_1 as the causal effect of primary school entry age on educational attainment and labor market outcomes is problematic, however, because of the possibility of unobserved omitted variables correlated with both actual entry age and long-run outcomes in adulthood. Such omitted variables could include, for example, parental preference and attitude regarding children's education. In general, richer families might delay children's enrollment in primary school until kids are more mature both physically and mentally, and these parents have more resources to make significant long-term investments in the development of their children such that they will have higher education level and better labor market performance. On the other hand, however, children in poor households may also experience delayed entry because their parents prefer them to help with housework. These kids would drop out of school once they reach the minimum legal age to work, and their lack of education would negatively affect future career. Additionally, actual age at school entry are likely measured with error such that OLS estimates are biased towards zero.[17]

We use an alternative strategy to address these concerns. Our identification strategy takes advantage of the nationwide school entry law in China that mandates the entry age and the cutoff date at which students should enroll in primary school. We utilize this cutoff date as a source of exogenous variation in the timing of school entry. Specifically, we apply a regression discontinuity (RD) framework[18] to this policy context, which allows us to examine the effects by comparing "all else equal" individuals with different actual entry ages due to the 1986 Chinese Compulsory Schooling Law. Formally, we estimate the following two equations:

$$Entry\_Age_i = \alpha_0 + \alpha_1 After_i + \alpha_2 Month_i + \alpha_3 (After_i \times Month_i) + \theta X_i + u_i \qquad (2)$$

[17] We assume that reporting errors in birth year and birth month, as well as primary school entry year, are random. Therefore, the calculated actual primary school entry age only contains classical measurement error. Namely, the measurement error is independent of the true actual primary school entry age and of the error term μ_i. This is also called the attenuation bias.

[18] A comprehensive description of the RD design can be found in Imbens and Lemieux (2008), and Lee and Lemieux (2010).

$$Y_i = \beta_0 + \beta_1 After_i + \beta_2 Month_i + \beta_3 (After_i \times Month_i) + \gamma X_i + \varepsilon_i \quad (3)$$

where i indexes individuals. Eq.(2) and Eq.(3) are the first-stage equation and reduced-form equation respectively. Independent variables are exactly the same in both equations. $Entry\_Age_i$, Y_i, and X_i follow the same notation as above. $After_i$ is a dummy variable indicating whether an individual i was born in or after September. $Month_i$ is the running variable, and represents the number of months between individual i's birth month and August. It is equal to zero for those born in August, positive for those born in or after September in a calendar year, and negative for individuals born prior to August. u_i and ε_i are the error terms. We cluster standard errors at the birth-year-birth-month level, as suggested in Lee and Card (2008).

The key identifying assumption underlying an RD design is that all predetermined individual characteristics vary smoothly across the mandated cutoff date. If this is satisfied, unbiased estimates could be obtained by simply comparing the average outcomes just to the left and just to the right of the cutoff date. In our models as shown above, the coefficients of interest are α_1 and β_1, which indicate the discontinuity at the threshold for first-stage and reduced-form regressions respectively. If the actual primary school entry age is the only mechanism through which mandated cutoff date affects the adult outcome, then β_1/α_1 would be the unbiased estimation of the causal effect of age at school entry on educational attainment and labor market outcomes.

6. Specification Checks of Regression Discontinuity

One potential threat to our identification strategy is the possibility that parents finely manipulate the month in which their child is born through conception or birth decisions. Parents who believe in "the early bird catches the worm" may wish that their child enroll in primary school at a younger age, and therefore plan for the delivery with the hope that their child could be born before September.

First, we ask whether there is any evidence of sorting around the cutoff month. Under our identifying assumption, there should be no such manipulation. In contrast, if there is manipulation as discussed above, we expect to see too many observations just to the left of the cutoff, and too few observations just to the right of the cutoff.

Results are shown in Figure 3, which indicate the density of individuals born right around the cutoff month. This figure shows clear evidence that there is no density discontinuity around the cutoff, consistent with the identifying assumption.

< Figure 3 about here >

In addition, we explore the magnitude of potential manipulation in our sample by testing whether observable individual pre-birth (predetermined) characteristics are smooth across the cutoff. If the identifying assumption holds, we should see all such variables vary smoothly through the cutoff month. Covariates in our data set include *Hukou* status, parental education, and ethnicity.

As shown in Figure 4, there is little evidence that these predetermined characteristics vary discontinuously across the threshold. Therefore, we are confident enough that there is no perfect manipulation and treatment is as good as randomly assigned on either side of the cutoff in our sample.

< Figure 4 about here >

7. Main Results

7.1 OLS Regression Results

Table 3-5 report results from the least squares estimation of Eq.(1), which serve as a benchmark for the RD estimates. Table 3 presents the results with dependent variable being years of schooling completed. The unconditional correlation between actual primary school entry age and years of schooling (Column 1) is similar to the estimate when including birth year fixed effects and birth region fixed effects (Column 2). However, when adding *Hukou* Status at Age 3 and parental education into the regression (Column 3), the magnitude of the estimate decreases by half (from -0.619 to -0.352). The estimate remains the same when adding gender and ethnicity as control variables (Column 4). The coefficient in Column (4) implies that a one-year increase in actual school entry age is associated with 0.352 years decrease in years of schooling completed on average. The coefficients on actual primary school entry age remain statistically significant at the 1% level for all columns in Table 3.

< Table 3 about here >

< Table 4 about here >

< Table 5 about here >

The pattern in terms of how the coefficients on actual school entry age change across different specifications in Table 4 and 5, is consistent with what we have discussed above in Table 3. However, in Table 4 where the dependent variable is the log personal annual income, when including *Hukou* Status at Age 3 and parental education (Column 3) and when adding gender and ethnicity (Column 4) into the regression as control variables, the significance level changes from 1% to 10%. In Table 5 where employment status serves as the dependent variable, the estimates are not statistically significantly different from zero except for the specification with only birth year fixed effects and birth region fixed effects as controls (Column 2).

OLS results suggest negative impacts of actual school entry age on educational attainment and labor market outcomes. This seems to be consistent with the belief that "the early bird catches the worm" since early enrollment in primary school would increase years of schooling and personal income, as well as the probability of employment according to the results in Table 3-5. However, we are still concerned about making a causal interpretation based on OLS estimates. Most importantly, if unobserved determinants of dependent variables (educational attainment, personal annual income and employment status in our sample, to be specific), are correlated with actual school entry age, then these omitted variables would generate biased estimates of the impact of primary school entry age. For example, parental attitude towards education, is correlated with children's years of education. Parents who undervalue education might delay children's enrollment of primary school, and these children might start to work once they reach the legal working age under the pressure of their parents. Furthermore, the OLS estimates are likely biased towards zero as it is possible that actual age at school entry contains random measurement error.

7.2 Regression Discontinuity Regression Results

To address the concerns in OLS estimation, we employ the RD approach that exploits the mandated cutoff date as exogenous variation in the timing of primary school entry. Figure 5 plot

the unconditional average actual primary school entry age, average years of schooling completed, average log personal annual income, and average probability of employment respectively against birth month. Each figure shows the linear fit of the mean values, and displays the estimated discontinuity as well as related standard error. We can observe from Figure 5 that there are discontinuities at the cutoff for both actual primary school entry age and years of schooling completed, but not for log personal annual income and probability of employment. We also residualize each variable on the y-axis in Figure 5 respectively by all controls employed in OLS regression (Column 4 of Table 3-5), and plot the residuals against birth month separately as shown in Figure 6. It is clear that the results on whether discontinuity is significant at the cutoff for each scenario are consistent with Figure 5.

< Figure 5 about here >

< Figure 6 about here >

In the remaining part of this section, we will first discuss the first-stage and reduced-form effects separately, and then check the robustness of our main results by restricting bandwidth to a narrow window around the cutoff value. We also explore whether the impact of mandated cutoff entry date differs by *Hukou* status at age 3, gender, or birth region.

7.2.1 The Impact of Mandated Cutoff Entry Date on Actual Primary School Entry Age

We run regressions to explore the first-stage effects of mandated primary school cutoff entry date based on Eq.(2). Specifically, we examine whether individuals born right after the cutoff date are enrolled at an older age than their counterparts born right before the threshold. Table 6 reports the estimates for α_1 of Eq.(2). All specifications lead to statistically significant and robust estimates of the discontinuity at the 1% significance level, but the discontinuity is only around 0.28 years. This implies that the cutoff entry date mandated by the compulsory education law does result in a noticeable jump in individuals' primary school entry age but the compliance with the law is far from being perfect—the predicted discontinuity with perfect compliance is nearly one year. To interpret the results, as the consequence of the compulsory schooling law, individuals who were born right after the cutoff date, on average, are nearly 3 months older at primary school entry than their counterparts born right before the threshold. An alternative way to

understand the coefficient, is that the compliance rate of the school entry cutoff article is only around 28%.

< Table 6 about here >

7.2.2 The Impact of Mandated Cutoff Entry Date on Educational Attainment

So far, we provide evidence that the school entry requirement does induce significant gaps in the actual school entry ages of individuals born around the cutoff date. These differences in the timing of school enrollment can then affect adults' final educational attainment through a couple of channels. In China, parents and children typically prefer to complete their education at an early age. Given a certain targeting age, say 25, early enrollment allows an individual to pursue more years of schooling. In this case, individuals born prior to the law cutoff date secure an inherent advantage in terms of educational attainment. In addition, the legal minimum working age in China is 16. Those who wish to start working as soon as possible end up with more years of schooling if they started school at a younger age. Both cases suggest a positive effect of younger primary school entry age on total years of schooling. We refer to this channel as the "timing effect". On the other hand, the literature on developed countries (Bedard and Dhuey, 2006) have documented the adverse effects of early enrollment on academic performance. If this is the case, due to poorer academic achievement in early school years, individuals enrolling in primary school earlier may not be able to pursue as much education as those entering school at an older age. The latter mechanism is referred to as the "academic performance effect". We test these two opposing hypotheses discussed above by gauging the net effect of the school entry age on years of schooling. In particular, we estimate Eq.(3) for the full sample, where the dependent variable Y_i is years of schooling completed.

The estimated discontinuities are presented in Table 7. Without controlling for any covariates (Column 1), we find a positive and statistically significant 0.624 years discontinuity in educational attainment right at the cutoff value. This suggests that individuals born right after the cutoff date, on average, obtain 7.5 months of schooling more than those born right before the cutoff. The implied conclusion is that the "timing effect" is dominated by "academic performance effect" in our sample.

< Table 7 about here >

7.2.3 The Impact of Mandated Cutoff Entry Date on Labor Market Outcomes

Resting on the evidence on adult educational attainment, we further investigate the long run impact of the school entry age on adult labor market outcomes. There are two major channels through which the school entry age could affect labor market outcomes. One channel is through an increase in educational attainment analyzed above— all else equal, more years of schooling would have a positive impact on employment and earnings. The other mechanism is through superior academic performance— students with higher test scores are more likely to find a job and earn a higher salary. Plus, as documented by prior literature, younger students in a class on average have poorer academic performance.

Due to data limitation, we are only able to test the first channel. Table 8 and 9 separately present the effects on labor market outcomes including personal annual income and employment status. Based on the results, we find no statistically significant effects on either outcome- we cannot distinguish the discontinuities at the cutoff from zero.

< Table 8 about here >

< Table 9 about here >

7.2.4 Robustness Checks

For each outcome discussed above, we show how the discontinuities vary according to the bandwidth chosen when we include all control variables in the specification. Panel A of Table 10 shows the robustness of the first-stage results, while Panel B shows the robustness of the results for educational attainment, and Panel C and D for labor market outcomes. In Panel A and B, the estimates are robust to bandwidth choices. However, Panel C and D present big changes in the magnitude of discontinuities, even though almost none of them are statistically significantly different from zero.

< Table 10 about here >

7.2.5 Effect Heterogeneity

In Table 11, we show the estimated impact of mandated cutoff entry date on each outcome for various groups. Panel A shows that the discontinuity for individuals with agricultural *Hukou* at age 3 is smaller than those with non-agricultural *Hukou* at age 3. Males have higher compliance rate (31.6%) than females (26.0%). Individuals born in eastern region have higher compliance rate (33.5%) compared to those born in central (25.9%) and western region (24.7%).

< Table 11 about here >

Panel B presents the heterogeneous effects on years of schooling completed for different subgroups. For individuals with agricultural *Hukou* at age 3, those born right after the cutoff date will attain 0.575 years of schooling more than those born right before the cutoff. The discontinuity for individuals with non-agricultural *Hukou* at age 3 is 0.472; however, this estimate is not statistically significantly different from zero. The magnitude of the effect on years of schooling completed is bigger for males (0.614 years) than females (0.471 years). The discontinuity is similar for all three birth regions, but only statistically significant for eastern region.

Panel C and D show the heterogeneity results for labor market outcomes. We can observe clear heterogeneity across different groups. However, these differences are not informative because of the big standard errors related to each discontinuity.

8. Conclusion

This paper is the first to use the threshold date for primary school entry set by the 1986 Chinese Compulsory Education Law to study the impact of the school entry age on educational attainment and labor market outcomes. Within a regression discontinuity framework, we exploit the exogenous variations created by the threshold date for primary school entrance in China. The study also contributes to the existing literature by estimating the long-term effects on educational attainment and labor market outcomes, which are of greater interest than short-term outcomes such as academic performances.

In this paper, we first investigate the compliance rate of the school entry law using the adult sample from the CFPS dataset. The first-stage estimates indicate a weak enforcement of the law— individuals born just after the threshold date, on average, are only 0.29 years older than

their earlier born counterparts at primary school entry. We then estimate the impact of the law on adult educational attainment. With controls, the estimates with the full sample show a significant 0.55 discontinuities in years of schooling completed. When breaking down the analysis by *Hukou* status, we find a positive 0.58 years discontinuity in educational attainment for agricultural *Hukou* sample, and a positive but not significant result for non-agriculturally registered individuals. The effect is also stronger for male gender and population residing in eastern region. Finally, whether separating by demographic or regional groups, we find no evidence that the school entry age affects labor market outcomes such as employment status and earnings. This implies that the long run net effect of school entrance age on the job market outcomes in China is nearly zero.

Our paper provides supportive evidence that there exists a significant positive causal effect of later primary school entrance on years of schooling. The Ministry of Education of China recently issued a document in February 2017 to relax the birth date cutoff at school entrance[19], leaving it a decision for provincial level education ministries to make according to actual situations. Based on our study, we believe that making the cutoff date requirement flexible will allow parents to make better decision for their children. And in light of the recent change, starting primary school education when the children are more mature intellectually would be a choice that benefit the children more in the long-run education attainment.

[19] See: (Chinese) http://www.moe.gov.cn/srcsite/A06/s3321/201702/t20170222_297025.html

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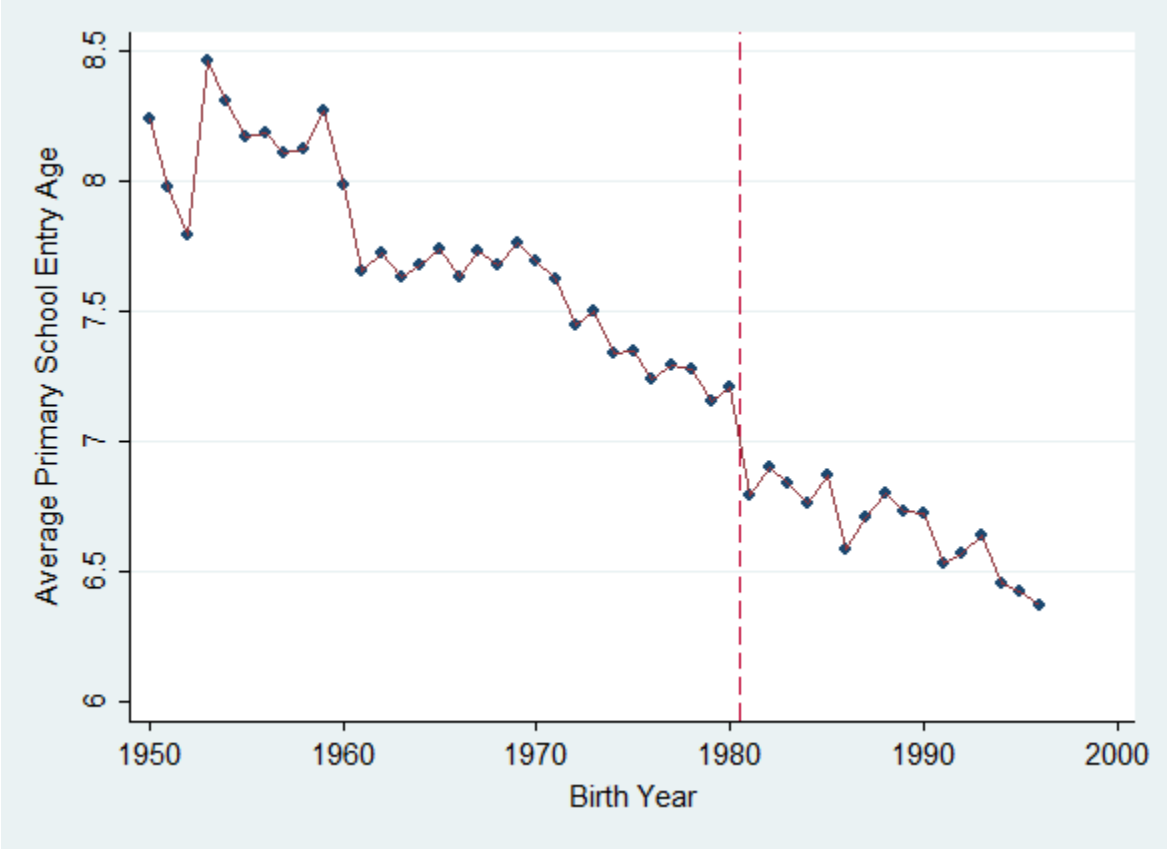
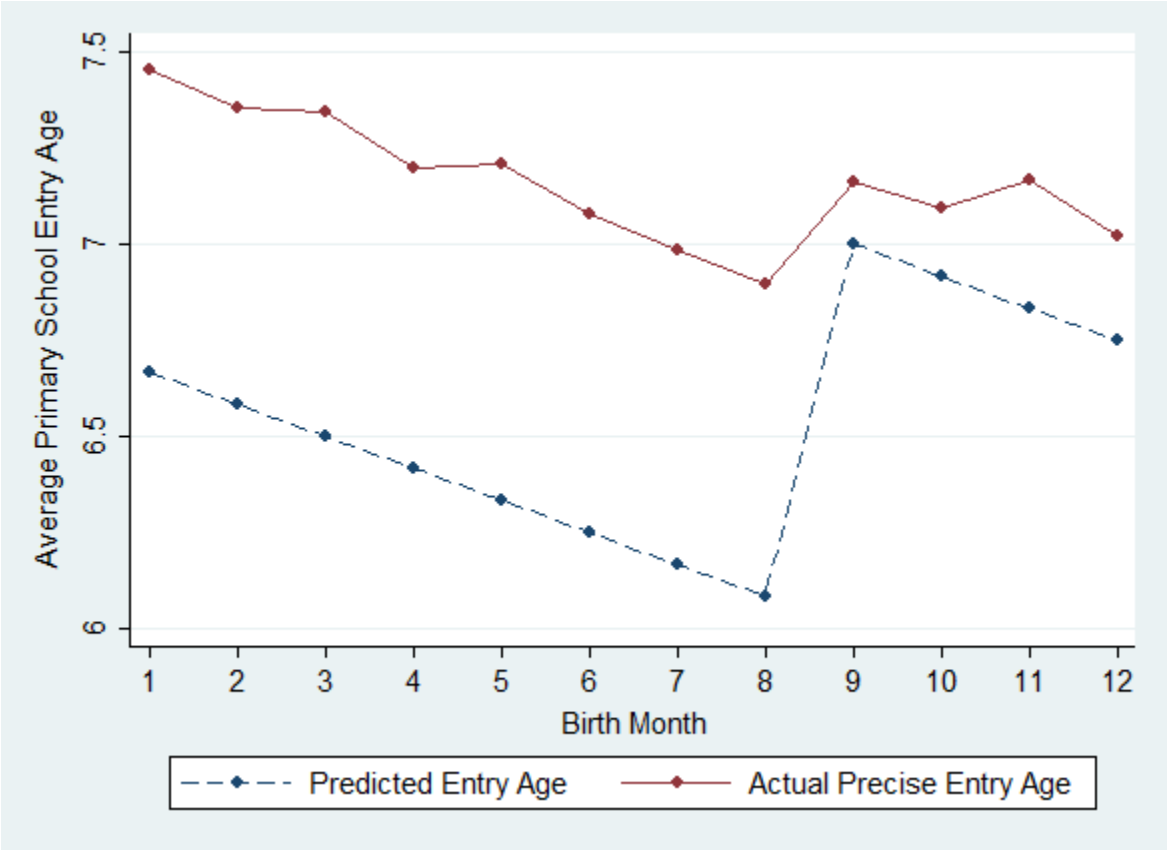
1. Figures

Figure 1: Average Primary School Entry Age by Birth Year



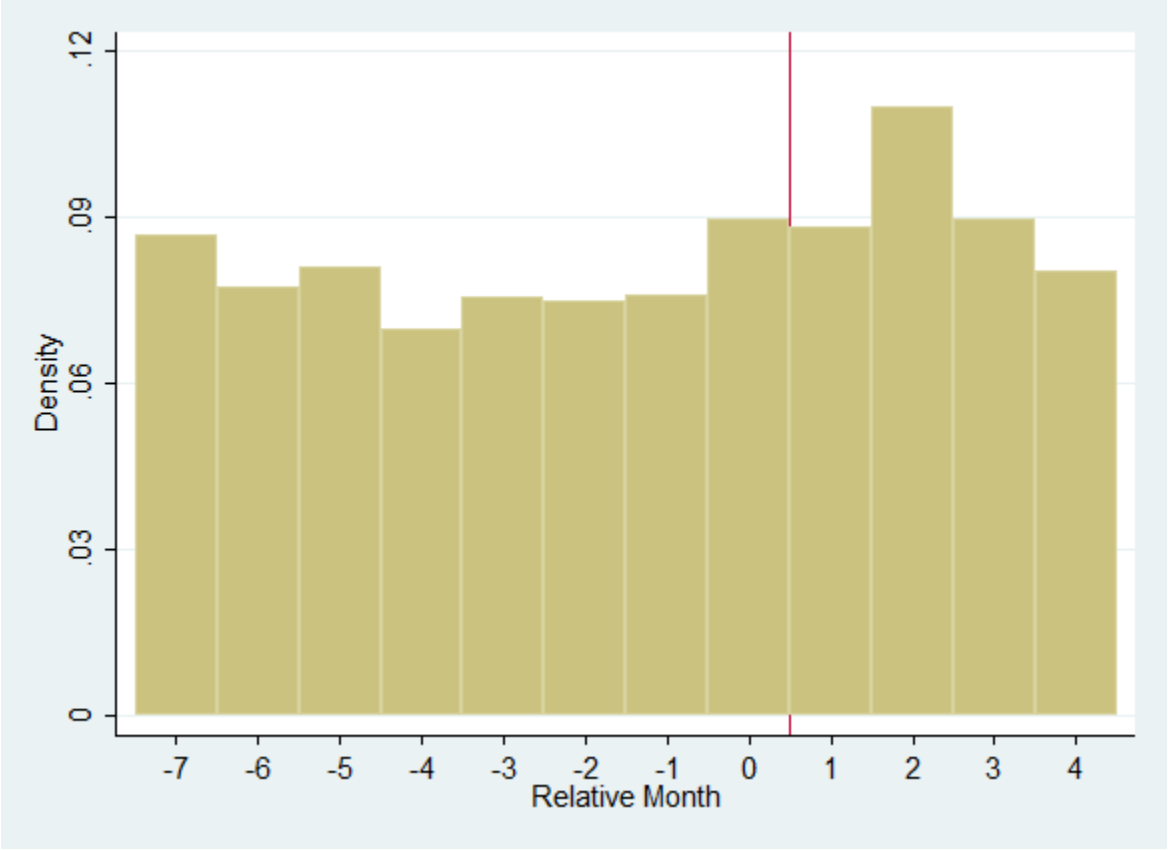
Note: Data comes from the adult sample with individuals born in and after 1950 (with 19,730 observations), China Family Panel Studies (CFPS), Wave 2012.

Figure 2: Predicted and Actual Primary School Entry Ages by Birth Month



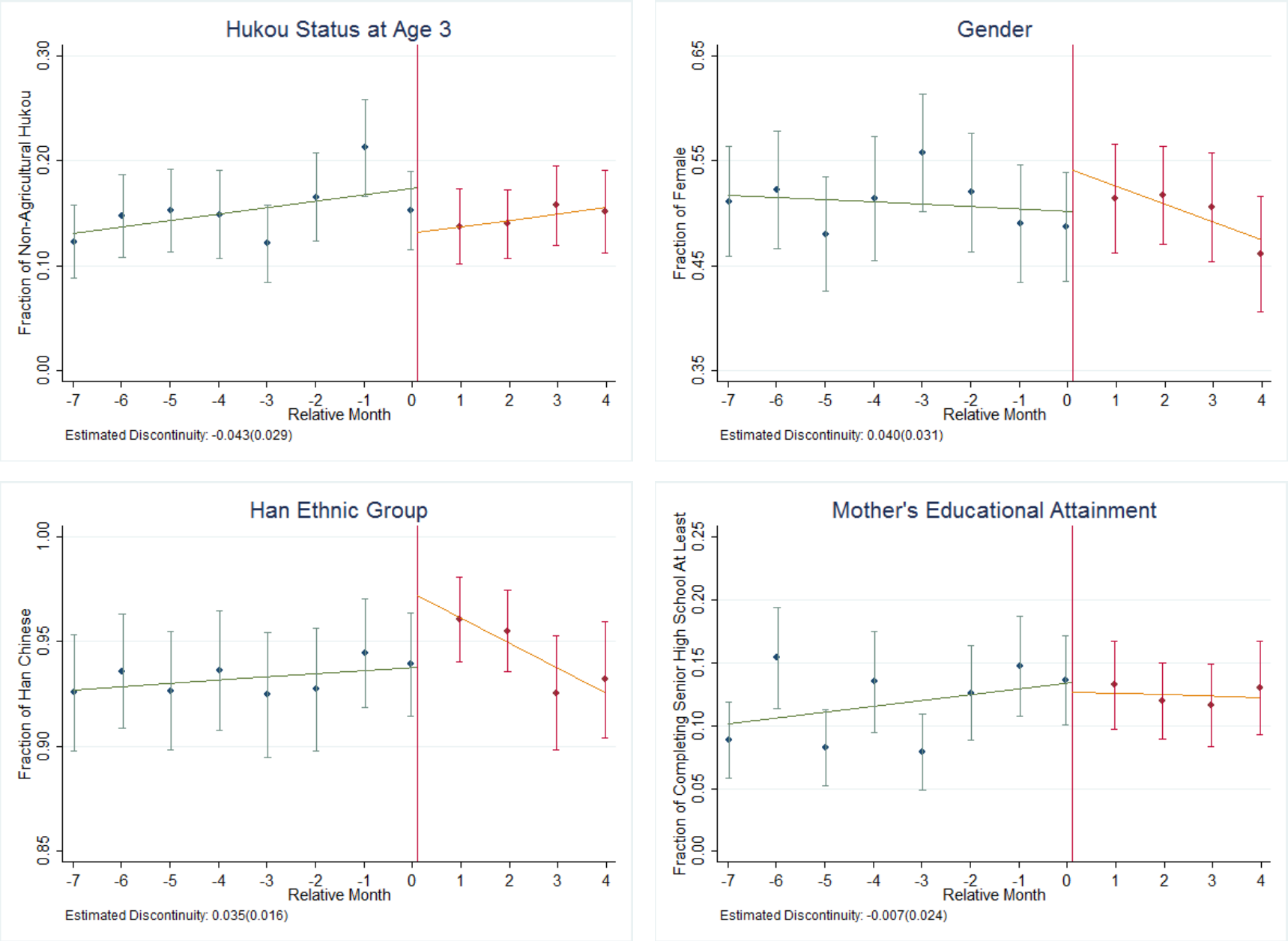
Note: Data comes from the adult sample used in the analysis (with 4,029 observations), China Family Panel Studies (CFPS), Wave 2012.

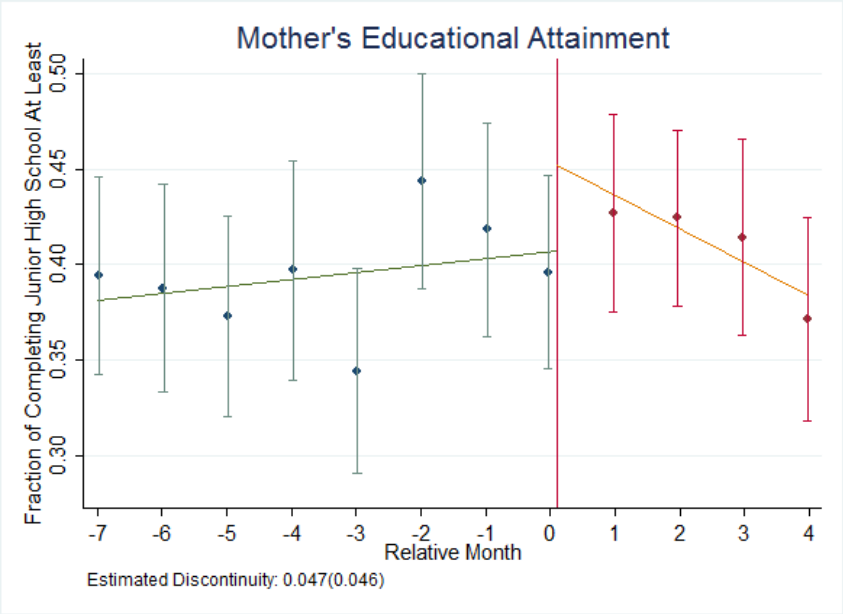
Figure 3: Histogram Test of Running Variable

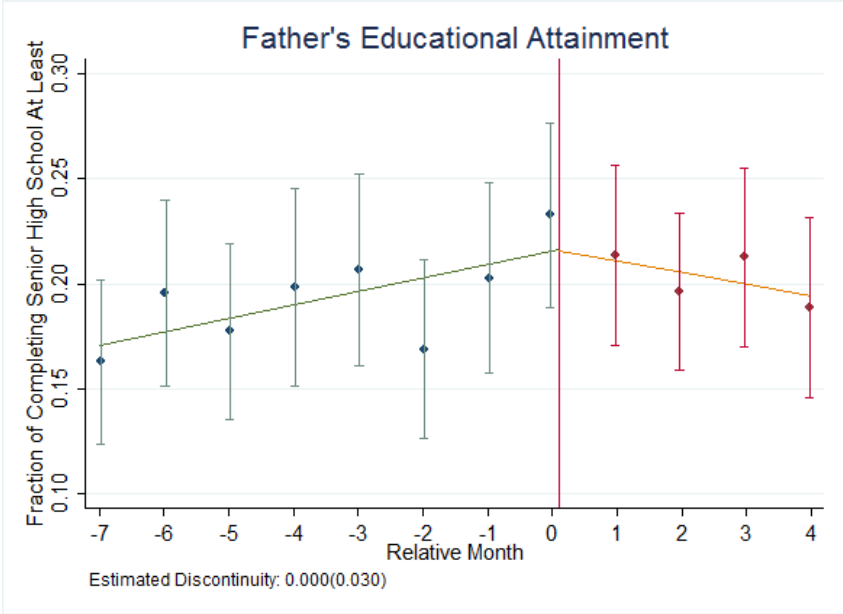


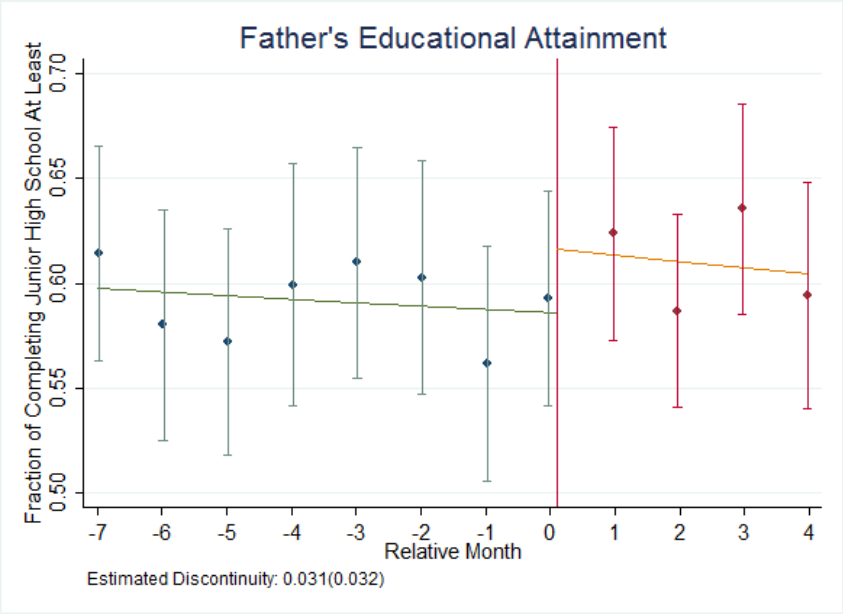
Note: This figure shows the density of individuals born in each month. Birth month is the running variable. Relative month indicates the number of months between individual *i*'s birth month and August. Therefore, "-7" for relative month refers to January for birth month; "0" for relative month refers to August for birth month; "4" for relative month refers to December for birth month.

Figure 4: Covariate Smoothness Tests









Note: The above figures provide tests of covariate balance around our discontinuity cutoff.

Figure 5: Unconditional Scatterplot

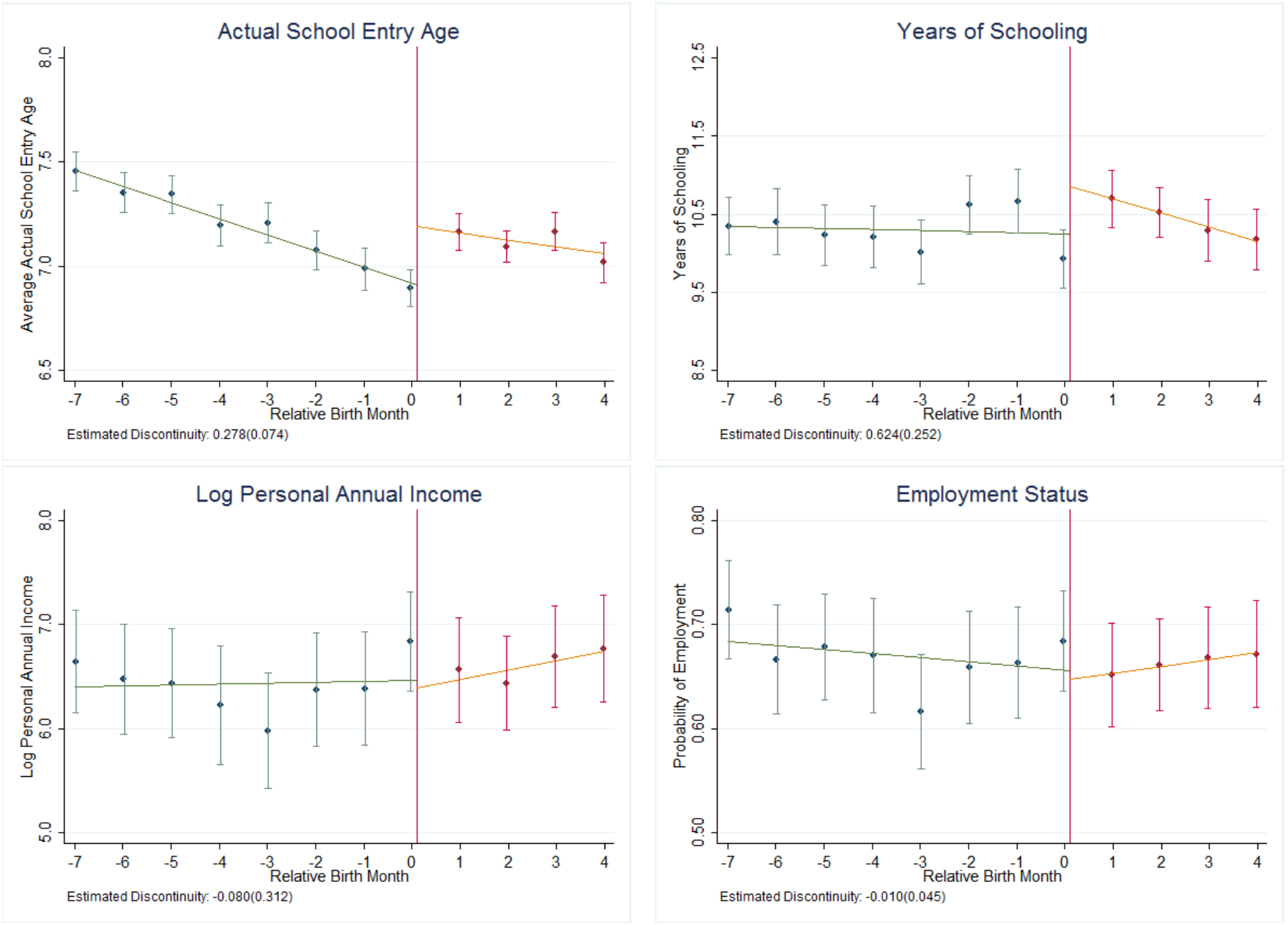
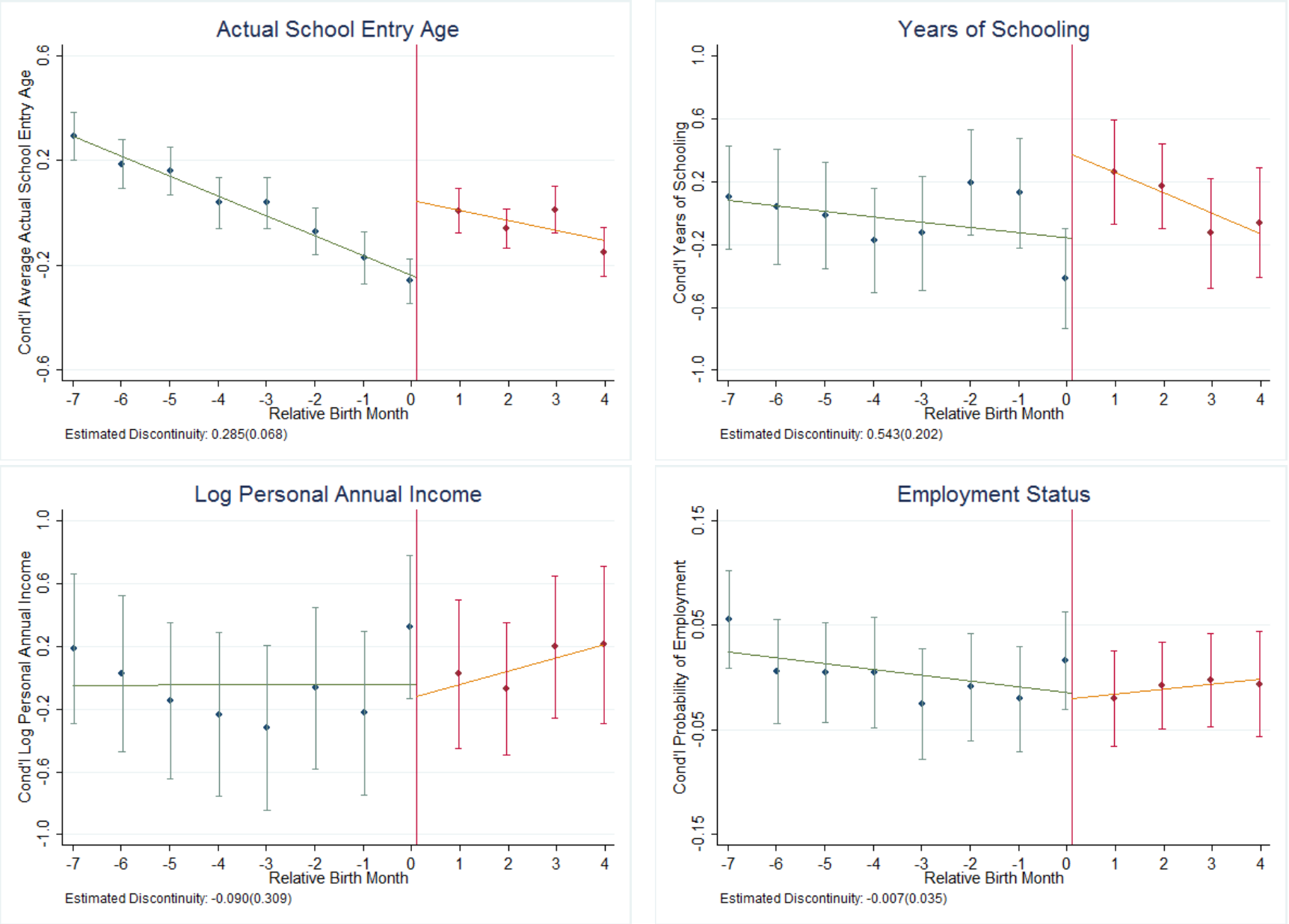


Figure 6: Conditional Scatterplot



2. Tables

Table 1: Implementation Date of Compulsory Education Laws by Province

Province	Implementation Date of CEL
Jiangxi	2/1/1986
Hebei	7/1/1986
Shanxi	7/1/1986
Liaoning	7/1/1986
Heilongjiang	7/1/1986
Shanghai	7/1/1986
Zhejiang	7/1/1986
Chongqing	7/1/1986
Sichuan	7/1/1986
Ningxia	7/1/1986
Beijing	7/8/1986
Jiangsu	9/9/1986
Shandong	9/12/1986
Henan	10/1/1986
Guangdong	10/7/1986
Yunnan	10/29/1986
Tianjin	11/6/1986
Jilin	2/9/1987
Hubei	3/1/1987
Anhui	4/29/1987
Shaanxi	9/1/1987
Guizhou	1/1/1988
Xinjiang	5/28/1988
Fujian	8/1/1988
Inner Mongolia	9/15/1988
Qinghai	10/1/1988
Gansu	9/3/1990
Hunan	9/1/1991
Guangxi	9/1/1991
Hainan	12/16/1991
Tibet	6/1/2008

Table 2: Summary Statistics

	Mean	SD
Panel A: Key Dependent Variables of Interest		
Primary School Entry Age	7.161	0.870
Years of Schooling Completed	10.347	3.552
Personal Annual Income (in RMBs)	19755.528	41711.877
1 If Currently Employed	0.668	0.471
Panel B: Individual Characteristics		
1 If *Hukou* Status at Age 3 is Non-Agricultural	0.150	0.357
1 If in Eastern Region at Birth	0.447	0.497
1 If in Central Region at Birth	0.340	0.474
1 If in Western Region at Birth	0.213	0.409
Father's Years of Schooling	7.676	3.723
Mother's Years of Schooling	5.707	4.336
1 If Female	0.507	0.500
1 If Han Ethnic Group	0.937	0.244
1 If Currently Attending School	0.014	0.119
1 If Current *Hukou* Status is Non-Agricultural	0.284	0.451
1 If Urban	0.476	0.499
1 If Married Currently	0.633	0.482
Age	25.587	3.296
Observations	4029	

Note: Han ethnic group has the largest population among the total 56 ethnic groups in China. The eastern region includes: Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan. The central region includes: Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, and Hunan. The western region includes: Inner Mongolia, Sichuan, Chongqing, Guizhou, Yunnan, Shannxi, Gansu, Qinghai, Ningxia, Xinjiang, Guangxi, and Tibet. The eastern region is the most developed region in China, while the western region is the least developed.

Table 3: The Impact of Primary School Entry Age on Years of Schooling Completed (OLS)

	(1) Years of Schooling Completed	(2) Years of Schooling Completed	(3) Years of Schooling Completed	(4) Years of Schooling Completed
Primary School Entry Age	-0.575***	-0.619***	-0.352***	-0.352***
	(0.069)	(0.068)	(0.060)	(0.060)
Birth Year FE	No	Yes	Yes	Yes
Birth Region FE	No	Yes	Yes	Yes
Hukou Status at Age 3	No	No	Yes	Yes
Parental Education	No	No	Yes	Yes
Gender	No	No	No	Yes
Ethnicity	No	No	No	Yes
Observations	4029	4029	4029	4029
R^2	0.020	0.055	0.239	0.240

Note: Standard errors in parentheses are clustered at birth-year-birth-month level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: The Impact of Primary School Entry Age on Log Personal Annual Income (OLS)

	(1) Log Personal Annual Income	(2) Log Personal Annual Income	(3) Log Personal Annual Income	(4) Log Personal Annual Income
Primary School Entry Age	-0.244***	-0.281***	-0.171*	-0.160*
	(0.087)	(0.087)	(0.089)	(0.085)
Birth Year FE	No	Yes	Yes	Yes
Birth Region FE	No	Yes	Yes	Yes
Hukou Status at Age 3	No	No	Yes	Yes
Parental Education	No	No	Yes	Yes
Gender	No	No	No	Yes
Ethnicity	No	No	No	Yes
Observations	4029	4029	4029	4029
R^2	0.002	0.019	0.045	0.108

Note: Standard errors in parentheses are clustered at birth-year-birth-month level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: The Impact of Primary School Entry Age on Probability of Employment (OLS)

	(1) 1 If Currently Employed	(2) 1 If Currently Employed	(3) 1 If Currently Employed	(4) 1 If Currently Employed
Primary School Entry Age	-0.011	-0.017*	-0.008	-0.008
	(0.009)	(0.009)	(0.009)	(0.009)
Birth Year FE	No	Yes	Yes	Yes
Birth Region FE	No	Yes	Yes	Yes
Hukou Status at Age 3	No	No	Yes	Yes
Parental Education	No	No	Yes	Yes
Gender	No	No	No	Yes
Ethnicity	No	No	No	Yes
Observations	4029	4029	4029	4029
R^2	0.000	0.035	0.048	0.102

Note: Standard errors in parentheses are clustered at birth-year-birth-month level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: The Impact of Mandated Cutoff Entry Date on Primary School Entry Age (RD)

	(1) Primary School Entry Age	(2) Primary School Entry Age	(3) Primary School Entry Age	(4) Primary School Entry Age
Discontinuity	0.278***	0.284***	0.287***	0.287***
	(0.074)	(0.069)	(0.068)	(0.068)
Birth Year FE	No	Yes	Yes	Yes
Birth Region FE	No	Yes	Yes	Yes
Hukou Status at Age 3	No	No	Yes	Yes
Parental Education	No	No	Yes	Yes
Gender	No	No	No	Yes
Ethnicity	No	No	No	Yes
Observations	4029	4029	4029	4029
R^2	0.031	0.043	0.067	0.067

Note: Standard errors in parentheses are clustered at birth-year-birth-month level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: The Impact of Mandated Cutoff Entry Date on Years of Schooling Completed (RD)

	(1) Years of Schooling Completed	(2) Years of Schooling Completed	(3) Years of Schooling Completed	(4) Years of Schooling Completed
Discontinuity	0.624**	0.561**	0.565***	0.548***
	(0.252)	(0.218)	(0.203)	(0.203)
Birth Year FE	No	Yes	Yes	Yes
Birth Region FE	No	Yes	Yes	Yes
Hukou Status at Age 3	No	No	Yes	Yes
Parental Education	No	No	Yes	Yes
Gender	No	No	No	Yes
Ethnicity	No	No	No	Yes
Observations	4029	4029	4029	4029
R^2	0.002	0.033	0.233	0.234

Note: Standard errors in parentheses are clustered at birth-year-birth-month level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: The Impact of Mandated Cutoff Entry Date on Log Personal Annual Income (RD)

	(1) Log Personal Annual Income	(2) Log Personal Annual Income	(3) Log Personal Annual Income	(4) Log Personal Annual Income
Discontinuity	-0.080	-0.088	-0.126	-0.090
	(0.312)	(0.331)	(0.322)	(0.305)
Birth Year FE	No	Yes	Yes	Yes
Birth Region FE	No	Yes	Yes	Yes
Hukou Status at Age 3	No	No	Yes	Yes
Parental Education	No	No	Yes	Yes
Gender	No	No	No	Yes
Ethnicity	No	No	No	Yes
Observations	4029	4029	4029	4029
R^2	0.000	0.017	0.044	0.108

Note: Standard errors in parentheses are clustered at birth-year-birth-month level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: The Impact of Mandated Cutoff Entry Date on Probability of Employment (RD)

	(1) 1 If Currently Employed	(2) 1 If Currently Employed	(3) 1 If Currently Employed	(4) 1 If Currently Employed
Discontinuity	-0.010	-0.013	-0.014	-0.007
	(0.045)	(0.039)	(0.038)	(0.035)
Birth Year FE	No	Yes	Yes	Yes
Birth Region FE	No	Yes	Yes	Yes
Hukou Status at Age 3	No	No	Yes	Yes
Parental Education	No	No	Yes	Yes
Gender	No	No	No	Yes
Ethnicity	No	No	No	Yes
Observations	4029	4029	4029	4029
R^2	0.000	0.035	0.049	0.102

Note: Standard errors in parentheses are clustered at birth-year-birth-month level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 10: Robustness Checks for RD Estimates

Panel A: Impact on Primary School Entry Age

	(1) Aug-Sep	(2) Jun-Nov	(3) Apr-Dec	(4) Feb-Dec	(5) Jan-Dec
Discontinuity	0.255***	0.244**	0.297***	0.286***	0.287***
	(0.050)	(0.093)	(0.069)	(0.069)	(0.068)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	717	2130	3040	3679	4029
R^2	0.087	0.056	0.050	0.057	0.067

Panel B: Impact on Years of Schooling Completed

	(1) Aug-Sep	(2) Jun-Nov	(3) Apr-Dec	(4) Feb-Dec	(5) Jan-Dec
Discontinuity	0.691***	0.820***	0.530**	0.533**	0.548***
	(0.130)	(0.228)	(0.209)	(0.205)	(0.203)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	717	2130	3040	3679	4029
R^2	0.256	0.248	0.239	0.238	0.234

Panel C: Impact on Log Personal Annual Income

	(1) Aug-Sep	(2) Jun-Nov	(3) Apr-Dec	(4) Feb-Dec	(5) Jan-Dec
Discontinuity	-0.393*	-0.436	-0.324	-0.169	-0.090
	(0.208)	(0.334)	(0.274)	(0.298)	(0.305)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	717	2130	3040	3679	4029
R^2	0.125	0.122	0.116	0.112	0.108

Panel D: Impact on Probability of Employment

	(1) Aug-Sep	(2) Jun-Nov	(3) Apr-Dec	(4) Feb-Dec	(5) Jan-Dec
Discontinuity	-0.042	-0.041	-0.024	-0.017	-0.007
	(0.031)	(0.040)	(0.034)	(0.035)	(0.035)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	717	2130	3040	3679	4029
R^2	0.131	0.129	0.109	0.108	0.102

Note: Standard errors in parentheses are clustered at birth-year-birth-month level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Heterogeneous Treatment Effects for Sub-samples

Panel A: Impact on Primary School Entry Age

	(1) Agricultural *Hukou* at Age 3	(2) Non-Agricultural *Hukou* at Age 3	(3) Male	(4) Female	(5) Eastern Region at Birth	(6) Central Region at Birth	(7) Western Region at Birth
Discontinuity	0.277***	0.316**	0.321***	0.260***	0.335***	0.259***	0.247*
	(0.077)	(0.123)	(0.093)	(0.091)	(0.086)	(0.096)	(0.138)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3424	605	1988	2041	1801	1371	857
R^2	0.067	0.072	0.071	0.079	0.086	0.062	0.088

Panel B: Impact on Years of Schooling Completed

	(1) Agricultural *Hukou* at Age 3	(2) Non-Agricultural *Hukou* at Age 3	(3) Male	(4) Female	(5) Eastern Region at Birth	(6) Central Region at Birth	(7) Western Region at Birth
Discontinuity	0.575**	0.472	0.614**	0.471*	0.590**	0.560	0.528
	(0.229)	(0.542)	(0.252)	(0.272)	(0.277)	(0.372)	(0.598)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3424	605	1988	2041	1801	1371	857
R^2	0.117	0.246	0.225	0.248	0.259	0.204	0.205

Panel C: Impact on Log Personal Annual Income

	(1) Agricultural *Hukou* at Age 3	(2) Non-Agricultural *Hukou* at Age 3	(3) Male	(4) Female	(5) Eastern Region at Birth	(6) Central Region at Birth	(7) Western Region at Birth
Discontinuity	-0.262	0.737	0.416	-0.693	0.102	-0.230	-0.369
	(0.358)	(0.749)	(0.407)	(0.514)	(0.421)	(0.562)	(0.736)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3424	605	1988	2041	1801	1371	857
R^2	0.107	0.146	0.058	0.080	0.101	0.121	0.125

Panel D: Impact on Probability of Employment

	(1) Agricultural *Hukou* at Age 3	(2) Non-Agricultural *Hukou* at Age 3	(3) Male	(4) Female	(5) Eastern Region at Birth	(6) Central Region at Birth	(7) Western Region at Birth
Discontinuity	-0.028	0.101	0.063	-0.079	0.050	-0.044	-0.072
	(0.038)	(0.071)	(0.042)	(0.050)	(0.058)	(0.058)	(0.066)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3424	605	1988	2041	1801	1371	857
R^2	0.103	0.137	0.059	0.061	0.098	0.095	0.087

Note: Standard errors in parentheses are clustered at birth-year-birth-month level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.