Does Higher Education Expansion Necessarily Increase Intergenerational Occupational Mobility?

Peng Zhang *

Beedie School of Business, Simon Fraser University

WMC4323, 8888 University Drive, Burnaby, BC, Canada, V5A 1S6

pza25@sfu.ca

Tel: +1 7787825545

August 21, 2020

Abstract

Equalising educational levels among individuals from different social classes may not be enough to stimulate intergenerational occupational mobility, because the occupational returns to education can differ between individuals from different social classes. This paper provides both theoretical and empirical analysis on what drives the difference in occupational returns to education and how this difference affects the role of college expansion on intergenerational occupational mobility. Compared with individuals from less privileged families, those from upper-class families can secure upper-class jobs even without a college degree due to nepotism, making their college premium smaller. As both ability and nepotism are unobserved, I exploit cross-province variations in minimum passing standards in college entrance exams in China and an exogenous college expansion to show that college education increases the chance of getting an upper-class occupation by 9.5% for individuals from less privileged families who would not be able to get an upper-class job without a college degree. This is larger than the college premium of individuals from upper-class families with the same ability, suggesting that policies making college education accessible to individuals from less privileged families can largely enhance intergenerational occupational mobility and achieve both equity and efficiency.

Keywords: Intergenerational mobility; Occupational choice; College expansion; Contemporary China.

JEL classification: I24, J24, J62.

*I would like to thank Pramila Krishnan, Toke Aidt, Jane Cooley Fruehwirth, Melvyn Weeks, Kaivan Munshi, Coen Teulings, Hamish Low, Daniel S. Hamermesh, Simon Quinn and participants in Royal Economic Society Symposium and European Economic Association Annual Conference for very helpful suggestions. Yiyao Zhang provides excellent research assistance. Financial support from the Cambridge Overseas Trust and Luca D' Agliano Scholarship is highly acknowledged.

1 Introduction

Education is a key mechanism through which advantages in socio-economic status are transmitted from one generation to the next (Becker and Tomes, 1979; Becker, 1981). College education is important as it directly relates to labour market performances and a college degree is often required for occupations with higher statuses. Governments aiming at increasing intergenerational mobility might consider college expansion as a potential way to improve the socio-economic status of individuals from less privileged families.

However, college expansion may not necessarily reduce intergenerational mobility for two reasons. Firstly, individuals who get an increased chance of college education after the expansion might largely come from upper-class families. This can happen especially in a merit-based educational system where college admission is based on test scores instead of referrals or school zoning. As students from less privileged families might be more motivated to work hard to get higher scores, college expansion makes college education more accessible to upper-class children who would otherwise not be able to reach the minimum test scores for college admission. Secondly, individuals from less privileged families may have small returns to education due to labour market frictions. Even college expansion largely increases their educational attainments, they may still have lower socio-economic status than those from the upper class.

This paper analyses how college expansion affects intergenerational persistence by taking into account the above two aspects simultaneously with a thorough measure of socio-economic status. Define college premium to be the gap in occupational status one can achieve with and without a college degree. I investigate theoretically and empirically what drives the difference in college premium among individuals from different social classes and verify that individuals who benefit the most from college expansion indeed come from less privileged families (i.e. they have lower pre-college human capital and would not be able to go to college without the expansion). I use occupational status as a thorough measure of socio-economic status. It captures not only economic achievements but also social privilege (Ganzeboom, 1996).

I first propose a theoretical framework to explain why college premium might even be higher among individuals from less privileged families. Individuals from upper-class families can benefit from nepotism which channels them to upper-class occupations even without a college degree. Their college premium is therefore limited as they can always get upper-class occupations regardless of educational attainments. I further verify that this pattern is not simply

driven by diminishing marginal returns to pre-college ability.

There are two empirical challenges in identifying college premium for individuals from different social classes. Firstly, calculating college premium requires observing the occupational status of the same person with and without a college degree, but these two scenarios are not observed at the same time. As individuals with higher abilities are more likely to obtain higher education and higher occupational status, a simple comparison between college and high-school graduates cannot disentangle the effect of college education from that of underlying abilities. It is also hard to find a measure of ability that does not capture the effect of education (Chevalier et al., 2004).

Secondly, the model predicts that the differential college premium results from nepotism which is exclusive to individuals from upper-class families. But it is hard to observe nepotism in the data.

To overcome the first challenge, I make use of China's merit-based college admission system and explore the inter-province variation in minimum requirements in college entrance exams. Every year since 1978, high-school graduates need to take the college entrance exam and pass the minimum scores in order to be admitted by universities. Before 2002 the exam questions were centrally designed and universal for almost all provinces, making exam scores comparable nationwide. The minimum scores vary across provinces. A person can be admitted to college in a province with a low passing standard but someone with the same test score in a province with a higher passing standard would not be able to go to college. This generates variations in education levels among individuals with the same test score. Following Tyler et al. (2000), I assume that individuals with the same test score have the same ability. Comparing individuals with the same test score provides an equivalent way to compare people with the same ability.

To tackle the second challenge, I capture the existence of nepotism indirectly by exploring an unexpected policy change in China's higher education in 1999 which reduced minimum scores for all provinces and largely increased the college admission rate (from 34% in 1998 to 48% in 1999). The passing standards in provinces with high minimum scores at the baseline were still very high after the college expansion, restricting college education to individuals from the upper class. On the contrary, the same level of college expansion in provinces with low standards makes the minimum score low enough to provide college education to individuals from less privileged families. If they have higher college premium than those from upper-class families who rely on nepotism, we should observe that the increase in occupational status after the college expansion

is larger in provinces with low minimum scores than in those with high passing standards. This cross-province and cross-time comparison is reflected in a difference-in-difference approach.

I find that the college expansion indeed increases occupational status in provinces with low minimum scores more than the same level of expansion in provinces with high minimum scores and those who benefit from the college expansion are mainly from less privileged families in provinces with low minimum scores. This result is unlikely to be observed without the existence of nepotism with which individuals from upper-class families can secure upper-class jobs. The magnitude is not small: college expansion increases the chance of getting an upper-class occupation by 9.5% for individuals from less prestigious families.

This paper contributes to the literature on the causal impact of education on intergenerational mobility (Bowles and Gintis, 2002; Currie and Moretti, 2003; Di Pietro and Urwin, 2003; Botticini and Eckstein, 2006; Mendolia and Siminski, 2017) by focusing on occupational status and the interventions in the college system, both of which are relatively less studied. Research on intergenerational persistence in socio-economic status has come a long way since the review in the Handbook of Labor Economics by Solon (1999) and has drawn extensive attention in recent years (Ermisch and Francesconi, 2002; Mazumder, 2005; Ng et al., 2009; Magruder, 2010; Black and Devereux, 2011; Long and Ferrie, 2013; Chetty et al., 2014, 2016; Chetty and Hendren, 2018a,b; Corak, 2019; Chetty et al., 2020; Bergman et al., 2020; Fagereng et al., 2020), but most of the studies focus on the intergenerational transmission of income or education. There is little literature on intergenerational occupational mobility (Black and Devereux, 2011). Evidence in developing countries is especially scarce. Current literature also focuses more on the causal impact of primary/secondary education, including compulsory schooling laws (Chevalier et al., 2004; Meghir and Palme, 2005; Oreopoulos et al., 2006; Carneiro et al., 2013), supply of schools (Assaad and Saleh, 2018), high school system (Pekkarinen et al., 2009; Lee, 2014; Bertrand et al., 2020) and schooling costs (Carneiro et al., 2013). The intervention in this paper occurs at a later stage and is more directly related to labour market outcomes.

Theoretically I contribute by showing that equalising educational levels is not enough to enhance intergenerational occupational mobility because occupational returns to college education can be different among individuals from different social classes. I propose that occupational returns can be higher among individuals from less privileged families because those from upper-class families have secured upper-class jobs due to nepotism even without a college degree.

Empirically I also contribute to a larger literature using natural experiments to estimate the

causal impact of education[1]. I simultaneously take into account two unobserved characteristics: precollege ability and nepotism. Although ability is unobservable, inter-province variation in minimum scores for college admission generates the variation in educational levels for individuals with the same ability. A further comparison on the change in occupational status between low and high standard provinces after a nationwide college expansion captures the college premium for marginal individuals who do not benefit from nepotism and would not be able to get an upper-class job without college degree. Unlike Tyler et al. (2000), this difference-in-difference approach does not require information on test scores for each individual. In fact, such information is not available in my data. A similar exogenous change in college admission requirement is also discussed in Maurin and McNally (2008) with only time variation, making it more difficult to disentangle the college admission effect from birth cohort effect.

I also show that a larger increase in occupational status in low score provinces indicates the existence of nepotism. Maurin and McNally (2008) suggest that a reduction in the requirement for college admission can increase the educational level of individuals from less privileged families, but do not discuss whether their occupational returns to education are the same as those from upper-class families. This paper explains the source of difference in occupational returns to college education by addressing the importance of nepotism.

The results in this paper have important policy implications both in and outside China. Since individuals from less privileged families have higher occupational returns to education, policies aiming at equalising educational levels among children from different family backgrounds would be sufficient to stimulate intergenerational upward mobility in China. This might explain the finding that China has a higher rate of intergenerational occupational mobility than many other developing countries (Takenoshita, 2007; Pakpahan et al., 2009; Chen, 2012; Hnatkovska et al., 2013). More importantly, policies making college education accessible to individuals from less privileged families can achieve both equity and efficiency. On the one hand, college expansion directly reduces inequalities by helping those from lower socio-economic background. On the other hand, such policies are efficient as the targeted group has higher occupational returns to college education than individuals from the upper class.

Furthermore, China's distinctive feature of the merit-based college admission system and the lack of the public/private division can work as a counterfactual setting for education policies in other countries such as the US. College entrance in the US depends not only on test scores but

[1]A detailed discussion is in Black and Devereux (2011) and Holmlund et al. (2011).

also referral letters which can be related to family background, and there is a large distinction between private (especially elite private) and public colleges. Recent research in the US found that even with the same level of SAT or ACT scores, children from lower-income families still have less chance of going to selective colleges than those from higher-income families (Chetty et al., 2020). A natural question to ask would be: what would happen to intergenerational mobility if college entrance were more merit-based? The answer can be partly reflected in this paper based on China's educational system where children who reach the minimum requirements in the college entrance exam can be admitted regardless of family background. The finding in this paper shows that a more merit-based system does provide a more meritocratic route for upward mobility.

The next section presents a theoretical framework which links college premium, college expansion and intergenerational occupational mobility. Section 3 discusses data and descriptive statistics. Details of the empirical strategy and results are reported in sections 4 and 5. Robustness checks and alternative explanations will be presented in section 6. There will be a detailed discussion on how this paper relates to and differs from existing papers on how the college expansion affects China's labour market and intergenerational persistence in the concluding part in section 7.

2 Theoretical Framework

Based on Becker and Tomes (1979) and Becker (1981), I propose a model where all intergenerationally transferable family characteristics are classified into two categories: precollege human capital (defined as ability) and nepotism. Ability determines both college education and occupational choice. Nepotism determines returns to college education.

Studies suggest that individuals make decisions on whether or not to attend college based on expected returns from college education (Neal and Johnson, 1996). Therefore, education and occupational decisions should be considered simultaneously (Gensowski and Piatek, 2015). Furthermore, unlike economic outcomes such as wage, occupational status in this model will capture both monetary and non-monetary returns to education.

Nepotism suggests that there is heterogeneity in occupational returns to college education. Individuals benefiting from nepotism can be channeled to an upper-class occupation even without a college degree and will therefore have smaller college premium. To study the impact of

college education, emphasis will be placed on marginal individuals who would not be able to get an upper-class job without a college degree.

2.1 Model setup

Suppose an individual has ability θ which refers to precollege human capital and is uniformly distributed from 0 to 1[2]. As individuals from upper-class families are likely to have higher ability (Neal and Johnson, 1996; Chetty et al., 2020), assume ability is $\underline{\theta} \leq \theta < 1$ for individuals from upper-class families and $0 \leq \theta < \underline{\theta}$ for those from outside upper-class families. This assumption will be verified in the empirical analysis .

I focus on individuals with at least a senior high school degrees[3] and assume the cost of senior high school education is 0. The opportunity cost of obtaining a college degree is written as $C(\theta, C)$ and $\frac{\partial C(\theta,C)}{\partial \theta} < 0$. The model in this paper does not rely on second order conditions of the cost function. That is, $\frac{\partial^2 C(\theta,C)}{\partial \theta^2}$ can be larger, smaller or equal to 0.

Occupational status is viewed as the utility from monetary returns (wage) and non-monetary returns (prestige). Profit-maximising firms set wage equal to marginal revenue product. Normalising prices to 1, the monetary return of each occupation equals marginal productivity, which is a function of ability θ and educational achievement EDU and can be written as $MPL(\theta, EDU)$. $EDU = C$ if the individual has a college degree and $EDU = NC$ if the individual only has a senior high school degree. Marginal productivity increases with both ability and educational attainment: $\frac{\partial MPL(\theta,EDU)}{\partial \theta} > 0$, $MPL(\theta, C) > MPL(\theta, NC)$. As high school graduates are more likely to perform routine jobs with homogenous productivity, I also assume ability improves marginal productivity among college graduates more than high school graduates: $\frac{\partial MPL(\theta,C)}{\partial \theta} > \frac{\partial MPL(\theta,NC)}{\partial \theta}$. The last condition implies that the monetary college premium, $MPL(\theta, C) - MPL(\theta, NC)$, is an increasing function of ability θ.

$V(H)$ represents utilities from social returns (prestige, reputation, etc.) of upper-class occupations. $V(L)$ is the corresponding measure for other occupations and $V(H) > V(L)$. Status of a particular occupation is a combined utility from monetary and social returns and is written as $MPL(\theta, EDU) + V(j)$, where $j = H$ for an upper-class occupation and $j = L$ for others.

Nepotism works when upper-class families can provide direct support or referrals, mak-

[2]This can be extended to other distributions such as normal distribution. Also, it should be written as θ_i for individual i. I omit subscript i for simplicity.

[3]This means a senior high school degree only and college degree. A college degree in this paper includes both an undergraduate degree and a postgraduate degree.

ing upper-class jobs available to their less qualified children. I assume there is a minimum threshold of productivity $\underline{MPL}$ required for upper-class jobs. For individuals outside upper-class families who cannot benefit from nepotism, they can get an upper-class job only when $MPL(\theta, EDU) > \underline{MPL}$. For individuals from upper-class families, they benefit from nepotism which adds a constant amount μ to their productivity. They can get upper-class jobs as long as $MPL(\theta, EDU) + \mu \geq \underline{MPL}$. The additive separability demonstrates the substitutability between productivity and nepotism, which is consistent with Munshi (2011) and indicates the source of intergenerational persistence in upper-class occupations[4].

$\underline{MPL}$ can be achieved by either high ability or high education or both. For simplicity, assuming nepotism is strong enough so that $MPL(\theta, NC) + \mu \geq \underline{MPL}$ for all $\underline{\theta} \leq \theta < 1$. That means individuals from upper-class families have a guaranteed upper-class job even without a college degree. Individuals from non-upper class families have $MPL(\theta, NC) < MPL(\underline{\theta}, NC) < MPL(\underline{\theta}, NC) + \mu = \underline{MPL}$, which indicates that they must obtain a college degree to be qualified for upper-class occupations.

Individuals simultaneously choose education and occupations based on ability θ:

- If $\underline{\theta} \leq \theta < 1$:

This individual will get an upper-class job regardless of education. He/she will choose to obtain a college degree if $MPL(\theta, C) - C(\theta, C) > MPL(\theta, NC)$. That is, $MPL(\theta, C) - MPL(\theta, NC) > C(\theta, C)$.

- If $0 < \theta < \underline{\theta}$:

This individual will get an upper-class job only if he/she has a college degree. He/she will choose to obtain a college degree if $MPL(\theta, C) + V(H) - C(\theta, C) > MPL(\theta, NC) + V(L)$. That is, $MPL(\theta, C) - MPL(\theta, NC) + V(H) - V(L) > C(\theta, C)$.

In both cases, an individual will choose to go to college when the college premium is larger than the cost of college education. Figure 1.1 plots the college premium and the cost of college as a function of ability θ. I draw linear curves for demonstration but the results are applicable to any types of curvature, as long as the college premium increases with ability and the cost of college education decreases with ability.

[4] Alternatively, family resource and network can contribute directly to marginal productivity because individuals from upper-class families can bring in additional resources such as political ties that will benefit companies. For example, an individual from an upper-class family can get an upper-class job if $MPL(\theta, EDU, \mu) \geq \underline{MPL}$. The structure and key predictions of the model will be consistent with the current one.

Insert figure 1.1 about here

2.2 Challenges in capturing college premium

As θ is not observed, there are two challenges in capturing college premium. First, calculating college premium requires observing the occupational status of a college graduate as well as the occupational status of a high school graduate with the same θ. As individuals with higher abilities are more likely to obtain better education and higher occupational status, a simple comparison between college and high-school graduates cannot disentangle the effect of college education from that of underlying abilities.

Second, I should be able to identify individuals with $\theta < \underline{\theta}$ who do not benefit from nepotism and verify that they indeed come from less prestigious families.

To tackle the first challenge, following Tyler et al. (2000), I assume individuals with the same test scores in the national standard college entrance exam have the same θ and exploit the cross-province variation in minimum passing standards. Comparing the occupational outcomes of individuals with the same test scores but different educational levels due to different provincial standards provides an estimate on college premium among individuals with the same ability.

Suppose there are two provinces: province 1 with a high minimum admission score and province 2 with a low score. Province 1 imposes larger costs of college education and leads to a composition of college students with higher abilities than province 2. From figure 1.1, individuals will be able to go to college if $\theta > \theta_1$ in province 1 and $\theta > \theta_2$ in province 2 ($\theta_1 > \theta 2$).

In province 1, the number of college graduates is $1 - \theta_1$ and the average occupational status (i.e. expected occupational status given the distribution of abilities) is:

$$y_H = \int_0^{\underline{\theta}} MPL(\theta, NC) + V(L)d\theta + \int_{\underline{\theta}}^{\theta_1} MPL(\theta, NC) + V(H)d\theta + \int_{\theta_1}^{1} MPL(\theta, C) + V(H)d\theta \quad (1)$$

In province 2, the number of college graduates is $1 - \theta_2$ and the average occupational status is written as:

$$y_L = \int_0^{\underline{\theta}} MPL(\theta, NC) + V(L)d\theta + \int_{\underline{\theta}}^{\theta_2} MPL(\theta, NC) + V(H)d\theta + \int_{\theta_2}^{1} MPL(\theta, C) + V(H)d\theta \quad (2)$$

2.3 College expansion, college premium and intergenerational occupational mobility

The second challenge is to identify the marginal individuals who do not benefit from nepotism and would not be able to get an upper-class occupation without a college degree. This can be done by comparing the change in average occupational status in province 1 and 2 in response to the same level of college expansion.

The college expansion reduces the minimum requirements for college entrance, which reduces the cost of college education for individuals at each ability level (i.e. shift the cost curve down). The new minimum score after the expansion stays high in province 1, which still largely restricts college education to individuals from upper-class families who would anyway get an upper-class occupation due to nepotism. However, the minimum score after the expansion in province 2 may be low enough to make college education accessible to those marginal individuals from less privileged families. Therefore, the differential increase in occupational status between province 1 and 2 after the expansion largely captures the college premium of marginal individuals.

For province 1, the minimum ability of individuals who are able to go to college is reduced from θ_1 to θ_1'. It is reasonable to assume $\theta_1' > \underline{\theta}$ as the new minimum score after the expansion policy is still high. The number of college graduates is $1 - \theta_1'$ and the average occupational status after the college expansion policy becomes:

$$y_H' = \int_0^{\underline{\theta}} MPL(\theta, NC) + V(L)d\theta + \int_{\underline{\theta}}^{\theta_1'} MPL(\theta, NC) + V(H)d\theta + \int_{\theta_1'}^{\theta_1} MPL(\theta, C) + V(H)d\theta + \int_{\theta_1}^{1} MPL(\theta, C) + V(H)d\theta \quad (3)$$

Equation 3 - 1 gives:

$$y_H' - y_H = \underbrace{\int_{\theta_1'}^{\theta_1} MPL(\theta, C) - MPL(\theta, NC)d\theta}_{\text{average college premium for high ability individuals}} \quad (4)$$

This provides an estimate of the average college premium of individuals with $\theta > \underline{\theta}$.

For province 2, the minimum ability of individuals who are able to go to college is reduced from θ_2 to θ_2'. $\theta_2' < \theta_2$ but there are three possible scenarios:

- Scenario 1: College expansion in a "low score" province benefits individuals outside the

upper class. The new cost curve for province 2 intersects the college premium curve at θ_2' and θ_3'. $\theta_3' < \underline{\theta} < \theta_2'$.

A comparison of the increase in average occupational status after the college expansion between provinces 1 and 2 gives the lower bound of the college premium of individuals from less privileged families:

$$\begin{aligned}(y_L'-y_L)-(y_H'-y_H) = &\int_{\theta_2'}^{\theta_2} MPL(\theta,C)-MPL(\theta,NC)d\theta - \int_{\theta_1'}^{\theta_1} MPL(\theta,C)-MPL(\theta,NC)d\theta \\ &+ \underbrace{\int_{\theta_3'}^{\underline{\theta}} MPL(\theta,C)-MPL(\theta,NC)+V(H)-V(L)d\theta}_{\text{average college premium for individuals with marginal ability}} \\ &< \underbrace{\int_{\theta_3'}^{\underline{\theta}} MPL(\theta,C)-MPL(\theta,NC)+V(H)-V(L)d\theta}_{\text{average college premium for individuals with marginal ability}} \quad (5)\end{aligned}$$

The proof is in the Appendix A.

- Scenario 2: College expansion in a "low score" province benefits individuals outside the upper class. The new cost curve for province 2 intersects the college premium curve at θ_2' only. $\theta_2' < \underline{\theta}$.

Insert figure 1.2 about here

A comparison of the increase in average occupational status after the college expansion between provinces 1 and 2 gives the lower bound of the college premium of individuals from less privileged families:

$$\begin{aligned}(y_L'-y_L)-(y_H'-y_H) = &\int_{\underline{\theta}}^{\theta_2} MPL(\theta,C)-MPL(\theta,NC)d\theta - \int_{\theta_1'}^{\theta_1} MPL(\theta,C)-MPL(\theta,NC)d\theta \\ &+ \underbrace{\int_{\theta_2'}^{\underline{\theta}} MPL(\theta,C)-MPL(\theta,NC)+V(H)-V(L)d\theta}_{\text{average college premium for individuals with marginal ability}} \\ &< \underbrace{\int_{\theta_2'}^{\underline{\theta}} MPL(\theta,C)-MPL(\theta,NC)+V(H)-V(L)d\theta}_{\text{average college premium for individuals with marginal ability}} \quad (6)\end{aligned}$$

The proof is in the Appendix A.

- Scenario 3: College expansion in both provinces only benefit individuals from the upper class. The new cost curve for province 2 intersects the college premium curve at θ_2' only. $\theta_2' > \underline{\theta}$.

Insert figure 1.3 about here

A comparison of the increase in average occupational status after the college expansion between provinces 1 and 2 gives:

$$(y_L'-y_L)-(y_H'-y_H) = \int_{\theta_2'}^{\theta_2} MPL(\theta,C)-MPL(\theta,NC)d\theta-\int_{\theta_1'}^{\theta_1} MPL(\theta,C)-MPL(\theta,NC)d\theta < 0 \tag{7}$$

The proof is in the Appendix A. Unlike the previous two scenarios, this difference-in-difference approach indicates that the increase in average occupational status in provinces with low minimum scores should be smaller than that in provinces with high minimum scores. The following empirical analysis will show that this is not the case in reality.

The importance of nepotism and alternative theories. The above model requires that nepotism helps individuals from upper-class families. A similar model without nepotism is provided in the Appendix A whose predictions will be proved to contradict the empirical finding. This shows that the existence of nepotism is important if we observe that the college expansion benefits provinces with low minimum scores more than those with high scores. Appendix A also rules out some alternative theories. One may also argue that a larger college premium among individuals from less privileged families is due to diminishing marginal returns to ability, not nepotism. This will be tested in the empirical analysis.

Summary. The above difference-in-difference framework in scenarios 1 and 2 gives an estimate of the lower bound of the college premium for marginal individuals who were not able to go to college and get an upper-class job without the college expansion. This provides implications on how the college expansion affects intergenerational occupational mobility. If ability is indeed correlated with family background and marginal individuals mainly come from less advantaged families, a college expansion policy can increase intergenerational mobility by providing marginal individuals with more human capital to be qualified for upper-class occupations.

3 Intergenerational Occupational Mobility and College Expansion in Contemporary China

3.1 Data

The primary data source is the individual-level data from the nationwide China General Social Survey (CGSS). This is a biannual (annual in 2005 and 2006) repeated cross-sectional database compiled by the Survey Research Center of the Hong Kong University of Science and Technology. The CGSS project targets at adults aged 18 and older. In accordance with the sampling process in China's fifth census in 2000, a national sample of 5,900 urban households was interviewed in the 2003-2006 phase, with modifications in the 2008-2015 wave due to community development (Bian and Li, 2012). I use data in 2003, 2005, 2006, 2008, 2010, 2011, 2012, 2013 and 2015. As there is systematic rural-urban division in occupational structure, I focus only on urban samples.

I restrict the sample to individuals with at least a senior high school degree (including senior high-school graduates, college graduates and postgraduates). Educational attainment is measured by the highest education ever achieved. I restrict the sample to adults born between 1975 and 1982 to avoid other possible confounding policy changes. First, a large scale reform in college entrance exams took place in 2002 when many provinces started to write their own exam papers with different difficulty levels. This makes the exam scores less comparable across provinces for individuals taking the college entrance exam after 2002 (i.e. born after 1982). Second, to achieve universal compulsory education, China launched its Compulsory Education Law on July 1, 1986, which made 9 years of education (6 years of primary school plus 3 years of junior high school) compulsory for students nationwide. All children at age six (or five or seven in some cases) should have the right and obligation to finish at least junior schooling regardless of gender, ethnicity and family background (Fang et al., 2012). As students make the decision of going to junior high school before age 11 (5+6=11), individuals aged 11 or younger in 1986 (born in or after 1975) would be equally affected by the compulsory schooling law. Third, individuals born between 1975 and 1982 all entered the labour market after 1978 when the reform towards a marketised economy was launched. To make sure individuals in our sample finished their whole education, I restrict the sample to people aged above 25.

CGSS data has three advantages in capturing occupational status. First, it collects information on the last job for currently unemployed respondents, which partly deals with potential

bias from labour force participation. I proxy the occupational status of currently unemployed respondents by coding their last jobs. Second, it provides retrospective information on the overall employment history of each individual, which makes it possible to track their first jobs and current jobs as individuals may experience job mobility. Third, the CGSS survey also contains detailed information on parents' occupation when each individual was 18 years old [5], which is roughly the time when parents and children make decisions on higher education and/or labour market.

I use a pooled sample of both men and women. Although some studies restricted the sample to men, other research pointed out that this might bias the results because changes in the supply of and demand for female labor over time will also affect men's choice in the job market (Kreidl et al., 2014). This distortion is larger in China's context where male and female labor forces are competing. For example, the manual sector is highly sex-segregated in many countries, but female participation in this sector is not highly restricted in China partly because women were involved in military production and manual work in heavy industries in the 1950s and 1960s (Chen, 2012). The proportion of female who stay at home for housework is less than 2% among Chinese women under 30 years old. I also run regressions by splitting the sample into men and women and found that the sign of these coefficients remain the same across genders.

Summary statistics of the national sample are presented in table A1. The gender ratio is more or less balanced. The average age is between 26.38 and 36.29 years, which is when respondents are at an early or mid stage of their occupation. Variations of these socio-economic variables across waves and provinces indicate that the province fixed effect and survey year fixed effects should be controlled in the empirical analysis.

Occupations in CGSS are classified based on ISCO-88 (International Standard Classification of Occupations 1988) from 2006 and CSCO (Chinese Standard Classification of Occupations) in 2003 and 2005. I convert CSCO to ISCO-88 classifications to make the measurements in each wave comparable [6]. ISCO-88 is a hierarchical four-digit system of nested classification of occupations based on skill requirements (Ganzeboom, 1996). For example, 1120 stands for "Senior government officials", 2110 for "Physicist, chemist and related professionals" and 8111 for "Mining plant operators" [7].

[5] The 2005 wave asked questions on parents' occupation when the respondents were 14 years old.

[6] The code is provided by China Family Panel Studies. The codebook is available at http://www.isss.edu.cn/cfps/sj/data2010/2013-07-11/180.html

[7] ISCO-88 does not acknowledge self-employment, ownership, and supervising status. Self-employers and small shop owners are classified with workers managing establishments on someone else's behalf. Members of the Armed

One remaining problem is that there might be changes in occupations since 1978. For example, new occupations have emerged after the process of marketisation and globalisation. To prove that this does not severely affect my results, I assume that the emerging occupations which are not included or cannot be integrated into the existing categories are classified as the category "hard to classify" in ISCO-88. Figure A1 in the Appendix shows the proportion of respondents whose occupations are "hard to classify" in each year. As this proportion is very small and not always increasing over time, there is no clear evidence that the classification of new occupations is a serious problem. In addition, individuals in the sample were all born in a narrow window (1975 to 1982), so that the labour market conditions they faced were very similar.

To measure occupational status, I convert ISCO-88 codes to the Socio-Economic Index of Occupational Status (ISEI) to map each occupation into its occupational standing, following Deng and Treiman (1997)[8]. ISEI is an optimal scaling which ranks occupations according to their skill levels and income status. More precisely, it is a ranking of attributes of different occupations based on their potential of converting individuals' educational attainment to expected earnings (Ganzeboom, 1996). ISEI scores are created by computing a weighted sum of socioeconomic characteristics of each occupation.

ISEI scores can be viewed as a continuous and comprehensive measure of the socio-economic status including both the monetary and non-monetary benefits. Consistent with the theoretical model, it is equivalent to $MPL(\theta, EDU) + V(H)$ for upper-class occupations and $MPL(\theta, EDU) + V(L)$ for others. It captures the attributes of occupations that can convert education into income, and therefore directly reflects the monetary prospects of each occupation. Conceptually those attributes also relate to non-monetary benefits such as occupational prestige. Occupations with higher educational requirements and higher income have more power resources, making them more prestigious (Ganzeboom et al., 1992).

Operational procedures for coding can be found in Ganzeboom (1996) and detailed comparisons of ISEI and ISCO-88 are in its appendix. The code of converting ISCO-88 to ISEI

Forces are excluded from the sample as working in the army is a temporary job.

[8]There are two additional scales used to measure socio-economic status of different occupations in sociology (Xie, 2012). Treiman's Standard International Occupational Prestige Scale (SIOPS) is largely based on prestige measures and reputation. Ganzeboom et al. (1992) has a thorough discussion on why ISEI is better than SIOPS in capturing socio-economic status. Erikson and Goldthorpe's class categories (EGP) map the ISCO-88 occupation categories into a discontinuous 10-category classification, which loses a lot of information on the status of individual occupation.

in China's context is provided by the China Family Panel Studies[9]. The resulting ISEI scores range from 16 to 90, with judges (ISCO-88 is 2422) gaining the highest score. The lowest score is held by domestic helpers and cleaners (ISCO-88 is 9130). A higher ISEI score represents higher occupational status[10].

One advantage of ISEI scaling is that ISEI was developed without interference from criterion external to the process of stratification itself. As a result, although ISEI was first created to study occupational stratification in the US, it can also be applied to China's context. It is arguably the best available international standard ranking of occupations (Ganzeboom et al., 1992).

Another advantage of the ISEI ranking system is that it has a relatively stable distribution across contexts and is robust to changes in the distribution of occupations as long as the underlying stratification principles remain the same (Kreidl et al., 2014). Thus the potential changes in occupational structure since 1978 become less of an issue. Research in sociology also suggests that the ISEI scale is less error prone than other similar scales in studying intergenerational occupational mobility (Ganzeboom, 1996).

The theoretical framework shows that college expansion can have very different implications on individuals from upper class and other families because resources (such as nepotism) exclusive to the upper class can channel their children into upper-class occupations even if they do not have a college degree. The remaining task is to distinguish upper class and other families.

I define family background based on the information on fathers. As mentioned by Lin and Bian (1991), fathers' occupational status, compared with mothers' resources, is more crucial in determining children's job market performance in urban China where male-superior social norm dominates. I run similar regressions by including both parents' occupational status and find that the coefficients of mothers' background are not significant. I replace father's occupational status with the highest occupational standing of either the father or the mother and find that the magnitude and significance of core variables do not change much.

Based on fathers' ISEI scores, I create a dummy variable to divide upper-class and other families. The threshold can be obtained from the distribution of ISEI scores across the whole

[9]The codebook is available at http://www.isss.edu.cn/cfps/sj/data2010/2013-07-11/180.html.

[10]The skill-level distinctions embedded in the logic of ISCO-88 are also reflected in the ISEI scale. For example, associate professionals average 16 points less (5 points more) than professionals (clerical workers). The manual/nonmanual divide (between clerical and skilled-crafts occupations) is 11 points. In the manual ranks, craft workers are only 3 points higher than machine operators, which are 11 points more than elementary occupations (Ganzeboom, 1996).

sample. Figure A2 shows that there is a discontinuity in fathers' ISEI scores around 60 which can be used as the threshold. This threshold also has economic intuitions because 60 is the mean value of ISEI scores of upper-level and middle-level professional workers who are viewed as the lower-upper-class occupations. In the appendix B, I also map ISEI scores to another well-known scale for social classification to confirm that 60 can be used as the threshold to divide upper-class and other families in the ISEI system. Therefore, an individual comes from an upper-class family if his/her father's ISEI status is above 60[11].

3.2 Intergenerational Occupational Mobility and the Role of Education

Summary statistics of occupational status and family background are in table 1. For each individual, I consider both the first job and the current job. ISEI scores of current occupations are only slightly higher than those of first occupations, which indicates the job mobility is not significant.

Insert table 1 about here

There is intergenerational persistence in occupational status as individuals from upper-class families still have a higher chance of getting an upper-class job in table 1. Details can be reflected from the transition matrix in table A3.1 where the rows are fathers' occupational categories and the columns are the corresponding categories for children. Intergenerational persistence exists as the rate of ending up in a particular occupational category is the highest when one's father also works in the same category. It is also hard for people from non-upper-class families to have an upper-class job. For example, the probability of becoming a professional is 27% when the father is also a profession. However, this rate decreases to 14% (9%) when the father is a clerk (has an elementary job). Similar patterns can be found when mobility is measured by the odds ratio in table A3.2[12]. The larger the odds ratio is, the more difficult it is for class mobility.

This persistence might be reduced by making college education more accessible to individuals outside the upper class, as college education can significantly increase the possibilities of

[11] A discrete measure of parental social classes is better than a continuous measure since the occupational returns to education differ most at the watershed between upper-class and other families, instead of a small increment of occupational status.

[12] The odds ratio gives the chances for an individual whose father is in occupation i ending up in i rather than in j, relative to the same chances for an individual whose father is in j, which is calculated as:

$$odds\_ratio_{ij} = \frac{f_{ii} \ / \ f_{ij}}{f_{ji} \ / \ f_{jj}}.$$

obtaining an upper-class job (Bian and Li, 2012). In figure 2, college graduates on average have 42% chance of getting an upper-class job while the corresponding number for high school graduates is only 9%. This gap persists across all cohorts born between 1975 and 1982 in the CGSS sample. This college premium suggests that higher education may be a way for children from less privileged families to achieve upward mobility.

Insert figure 2 about here

3.3 College Entrance Exam System and the Natural Experiment

China has a primarily merit-based higher education system since 1978[13]. All high-school students need to take the standard and highly competitive national college entrance exam to be admitted to college regardless of their family background (Li et al., 2013).

I use the exam score as a proxy for ability. The advantage is that almost all provinces used the same exam papers before 2002. The only exception is Shanghai which adopted its own exam paper from 1985. However, their innovation in exam questions mainly aimed at experimenting different formats, instead of deliberately increasing or decreasing the difficulty of exams. And the results remain consistent if Shanghai is excluded from the analysis. There are also standard answers to each question in each subject. The standard answers were designed by the national authority and provincial exam markers should strictly obey the standards. All this makes exam scores in different provinces directly comparable.

The variation in the minimum scores across provinces allows for a comparison of individuals with the same ability but different educational levels. A person whose score is below the minimum requirement for college admission and therefore can only get a high school degree in one province would be admitted to college in another province with a lower minimum admission score.

The minimum scores for each province depend on the quota assigned by the Ministry of Education, conditional on the distribution of exam scores among students. The quota is determined by: a) the historical quota; b) population size (in particular the number of high school graduates who attend the college entrance exam); c) the capacity of all universities in each province and d) the quality of primary and secondary education. Provinces with more quota historically will get more, which indicates that the minimum scores are not simply based on

[13]The merit-based higher education system has a long history in China. It was however disrupted by the social chaos during the Cultural Revolution. Colleges were closed until 1978 when Deng Xiaoping reinstated the National College Entrance Examination.

current socio-economic conditions. Provinces with more high school graduates and more (or larger) universities will get more quota. Furthermore, more quota relative to the number of high school graduates would be given to less developed provinces to make up for the inadequate resources in primary and secondary schools (Wang and Chan, 2005; Li, 2010).

Although each criterion for the quota has a clear target, the minimum scores resulting from all these criteria are a combination of different factors and do not have monotonic relationships with socio-economic factors such as the level of economic development. For example, economically developed provinces such as Jiangsu and Zhejiang consistently have very high minimum requirements, while other developed places such as Beijing and Shanghai have much lower minimum scores. Minimum scores are low in some of the less developed provinces like Xinjiang and Tibet, but are high in others such as Guangxi and Henan. Province fixed effects will be included in regression models to account for the systematic difference across provinces.

I collected data on the minimum scores for all provinces in three years before the college expansion policy: 1991, 1993 and 1998 [14]. To make the scores comparable across years and provinces, minimum score is defined as a percentage of the full mark instead of an absolute value. If the minimum score is 535 and the full mark is 750, the minimum score after the recalling is $535/750 * 100 = 71.3$. In the following text, I use *"minimum score"* to refer to the minimum score as a percentage of the full mark. To avoid the discrepancy of exam scores in a particular year, I calculate the average minimum score over all three years for each province.

There are two tracks for high school students: science and arts. All students have to take exams on Chinese literature, mathematics and English, but a science student has to choose two from physics, chemistry and biology while an arts student chooses two from history, political science and geography. The minimum scores are separate for science and arts students for each province in each year, but are highly correlated (the correlation is 0.9), indicating it is very rare for a province to have a high minimum score in one track and a low score in the other track.

A province is defined as a "*high score province*" if its average minimum score over the three years are *above* the medium level for both science and arts students. Other provinces are defined as "*low score province*". Define a dummy $D_j = 1$ if it is a "*low score province*" and $D_j = 0$ if it is a "*high score province*". In the robustness check I also use a continuous measure of minimum scores instead of this binary division.

[14] The provincial level minimum score in other years are not systematically accessible and therefore incur many missing values.

The higher education system in China is hierarchical. There are two minimum scores for each province in each year: a lower one for the admission to the second-tier universities and a higher one for the first-tier universities[15] and these two minimum scores are highly correlated (the correlation is 0.9). A province with a higher minimum requirement for the first-tier universities will also have a higher minimum score for the second-tier universities. However, the information on the minimum scores for the second-tier universities is missing for 10 out of 31 provinces while there is no missing value for the first-tier universities. I therefore use the minimum score for the first-tier universities to get the best coverage of sample. But given the information above, this minimum score should not simply be interpreted as the minimum score only for first-tier universities, but a reflection of the minimum standard for all types of universities.

Students can go to universities in any province but must take the college entrance exam in the province where their "hukou" (i.e. household registration) is registered (Wang and Chan, 2005). One limitation of the CGSS data is that we only observe people's residence at the time of the survey rather than the time when they took college entrance exams. However, CGSS data asks a series of retrospective questions to identify people's migration history and changes in "hukou". In particular, for individuals who moved across provinces, there is information on which provinces they resided in before migration and when the migration took place. For each individual, I can resume the province of "hukou" registration when he/she participated in the college entrance exam in the following four ways: a) if individuals reported they never moved, they took the college entrance exam in the province where their current "hukou" is; b) if individuals reported they had moved but only within provinces, the province where they took the college entrance exam is the same as the current one; c) if individuals moved from another province before the age of 16 (this is usually the youngest age when people take college entrance exams), the province where they took the exam is the same province as the current one; d) if individuals moved from another province after the age of 16, they took the college entrance exam in the province where they lived before coming to the current one.

I use the largely unexpected college expansion as a natural experiment to capture the college premium for marginal individuals who would not have got a college degree and an upper-class job without the expansion policy. In June 1999, the central government increased the number of students admitted to tertiary education by 0.55 million, the largest increase since 1978. In

[15]In recent years there are additional minimum scores for provincial third-tier and local four-year colleges (Jia and Li, 2020). But there were only two levels when individuals included in my sample took the exam.

addition, the admission rate increased from 34% in 1998 to 48% in 1999 (Yeung, 2013). This made year 1999 a milestone in the history of China's higher education. More importantly, the timing was unexpected to high school graduates and their families as the announcement was made less than one month before the college entrance exams, which did not dramatically change the behaviour of high school graduates given the short notice.

The drastic increase in the college admission rate in 1999 is reflected in panel 3a in figure 3 for the national sample based on China Statistic Yearbook. Meanwhile, the promotion rates at other educational levels do not change. The primary school admission rate, the promotion rate from primary to junior high schools and the promotion rate from junior high school to senior high schools remain almost constant before and after the college expansion, indicating that restricting my sample to individuals with at least a senior high school degree does not lead to selection bias on the composition of individual ability at the high school level.

Potential concerns of the exogeneity of this natural experiment arise from the following aspects. First, some high school graduates who were expected to take college entrance exams in 1998 may have been able to anticipate the expansion policy in the next year and thus postponed their exams to 1999. This is not very likely as the expansion policy was announced very shortly before the exam and students usually made decisions on which year they should take the exam well before that. Second, students who failed the exam in 1998 may retake the exam in 1999, which lowers the average ability of candidates in 1999. However, it does not affect the results because re-examination happens every year, which cannot explain the sharp gap in educational achievements between cohorts born before and after 1979. Third, this college expansion was achieved by lowering the minimum requirement of exam scores for college admission, and students could adjust the efforts they took in the exam. If they noticed the minimum score was lower than before, they could exert less efforts to narrowly reach the minimum standard. However, access to higher education is still a competitive process in and after 1999, described as "thousands of troops crossing a single-log bridge" in the public media (Yeung, 2013). Students still have to exert a lot of efforts to pass the threshold and better scores lead to better universities. More importantly, the minimum scores are announced after the exam is finished. By the time students take the exam, there is very limited information on the passing score, and historical records are not always helpful. As the college expansion continued in years after 1999, students who took the college entrance exam in recent years might change their behaviours and incentives (as suggested in Lee (2015)). However, my sample only

includes students who were born before 1982 and were therefore less likely to take the exam after 1999.

One empirical challenge is that the CGSS data does not record information on when each individual took the college entrance exam. I proxy this with information on individuals' year of birth. After the 1986 compulsory schooling law, students in China are required to go to primary schools at age 6 or 7. They will be 18 or 19 years old when taking the college entrance exam (Fang et al., 2012). Given some students manage to go to school earlier than 6 years old and some students take additional years in school due to grade repetition, I assume in most cases individuals graduate from high school and take the college entrance exam between the age of 17 and 20. It is therefore plausible to assume that students born between 1979 and 1982 (at the age of 17 - 20 in 1999) were the most affected by the expansion policy. Individuals were not potentially affected by the expansion policy if they were born between 1975 and 1978.

I create a dummy T_t which equals 1 for those born between 1979 and 1982 and $T_t = 0$ for the other birth cohorts. Panel 3b in figure 3 replicates panel 3a using this CGSS sample and also shows a spike in the college admission rate for cohorts who took the college entrance exam in 1999 (i.e. born between 1979 and 1982).

Figure 3 also suggests that the promotion rate from high school to college is far from 100% even after the expansion, indicating that college admission is still competitive and highly correlated with ability. It is reasonable to assume that many individuals who benefit from the college expansion in provinces with high minimum scores are still the ones with high ability and would get an upper-class job even without a college degree. But the college expansion in provinces with low minimum scores made a college degree more accessible to marginal individuals who would not be able to obtain an upper-class occupation without a college degree.

Insert figure 3 about here

4 Empirical Strategies

4.1 College premium for marginal individuals and the baseline diff-in-diff regression

Let Y_{ijt} indicate the occupational status of individual i taking the college entrance exam in province j at year t. Equation 5 and 6 provide a fundamental framework for the following diff-in-diff empirical specification:

$$Y_{ijt} = \alpha + \phi T_t * D_j + \beta X_i + v_j + w_t + u_{ijt}. \quad (8)$$

Y_{ijt} relates to whether the province has a high or low minimum score for college admission ($D_j = 1$ if the minimum score in a province is lower than the median), and whether the person took the exam before or after the college expansion ($T_t = 1$ if an individual is born in or after 1979). The key parameter is ϕ, which captures the lower bound of the average college premium for marginal individuals who would not have attended college and got an upper-class job without the college expansion policy. ϕ is positive if these marginal individuals have higher college premium than those from the upper class. X_i includes a series of control variables to account for individuals' preference over occupations such as gender and ethnicity (i.e. whether one is from an ethnically minority group). Furthermore, fathers' age when children were born may affect children's preference over occupations as this can lead to children's different life experiences. Fathers' communist party membership is also important in determining occupational preference as the communist ideology prefers certain occupations over others (Bian, 1997). I also control for calendar effects and trends in reported education and occupation by adding dummies on the year each survey was conducted. u_{ijt} is a random factor such as luck during job application.

I also include province fixed effects v_j and birth year fixed effects w_t. Province fixed effects take into account the intrinsic difference between provinces in occupational structure. Metropolitan cities such as Beijing and Shanghai and economically advanced provinces in east China may provide better job opportunities than others. Birth year fixed effects control for the systematic difference between each birth cohort, as different cohorts may face different macroeconomic background and opportunities for occupation.

4.2 Social class, education, intergenerational mobility and the diff-in-diff-in-diff regression

The theoretical framework relies on the assumption that individuals from upper-class families have higher pre-college human capital. If that is true, we should observe that individuals with marginal ability in the province with a low passing standard who benefit the most from the college expansion are indeed from less privileged families.

Individuals come from two social classes based on fathers' occupational status: upper class (h) and others (l). Y_{ijt}^k indicates the occupational status of individuals from social class k,

$k \in \{h, l\}$. Similar to equation 8, occupational status is determined by:

$$Y_{ijt}^k = \alpha^k + \phi^k T_t * D_j + \beta X_i + v_j^k + w_t^k + u_{ijt},\ with\ k \in \{h, l\}.$$

If marginal individuals are mainly from less prestigious families, we would expect $\phi^h \approx 0$ and $\phi^l > 0$[16].

Let S_{hi} be a dummy variable which equals 1 if an individual is from an upper-class family and $\alpha^h = \alpha^l + \delta_h$, $\phi^h = \phi_1 + \phi^l$, $v_j^h = v_j^l + \eta_1 D_j$, $w_t^h = w_t^l + \gamma_1 T_t$. We have:

$$Y_{ijt} = Y_{ijt}^h S_{hi} + Y_{ijt}^l (1 - S_{hi})$$

$$Y_{ijt}^h = (\alpha^l + \delta_h) + (\phi_1 + \phi^l) T_t * D_j + \beta X_i + (v_j^l + \eta_1 D_j) + (w_t^l + \gamma_1 T_t) + u_{ijt}$$

$$Y_{ijt}^l = \alpha^l + \phi^l T_t * D_j + \beta X_i + v_j^l + w_t^l + u_{ijt}$$

Whether or not the college expansion will increase intergenerational mobility can be revealed from a single diff-in-diff-in-diff regression:

$$Y_{ijt} = \alpha^l + \phi_1 S_{hi} * T_t * D_j + \phi^l T_t * D_j + \eta_1 S_{hi} * D_j + \gamma_1 * S_{hi} * T_t + \delta_h S_{hi} + \beta X_i + v_j^l + w_t^l + u_{ijt}. \quad (9)$$

- If $\phi_1 < 0$: $\phi^h < \phi^l$ so that an increase in educational achievements among students from disadvantaged families can stimulate intergenerational upward mobility.
- If $\phi_1 \geq 0$: $\phi^h \geq \phi^l$ so that an increase in educational achievements makes less difference in intergenerational upward mobility.

5 Empirical Results

5.1 Balance test

Table 2 reports the balance test results between provinces with high and low minimum scores in college entrance exams. In both arts and science track, the minimum scores in "low score"

[16] β is assumed to be constant among children from different social classes for simplicity. I also run regressions where β differs among different social groups and the results are quite similar.

provinces are significantly lower than in "high score" provinces.

Insert table 2 about here

The difference-in-difference framework requires that a larger increase in average occupational status after the college expansion in "low score" provinces than "high score" ones should mainly be because in "low score" provinces, the expansion policy made college education available to individuals with marginal ability, while college education in "high score" provinces is still largely restricted to upper-class individuals who have smaller college premium. The validity of this difference-in-difference approach lies in the assumption that provinces with high and low minimum scores are balanced in unobservable characteristics that might affect occupational status.

In the baseline before 1999, there should be comparable ability compositions of students who take college entrance exams in these two types of provinces. There might be the concern that high-ability individuals take rent-seeking actions by moving their "hukou" into "low score" provinces right before the college entrance exam for a better chance of admission, which drives up the proportion of high-ability individuals in "low" score provinces. The potential differential composition of ability between the two types of provinces may also result from a higher proportion of upper-class families in economically developed "low score" provinces such as Beijing and Shanghai.

To deal with the concern, I first check if there is a large migration flow from "high score" to "low score" provinces before the college entrance exam. I calculate the proportion of individuals migrating before the age of 16 over all migrants into the current provinces, (i.e. "migration" in table 2). The proportion of migration before college entrance exams is small and quite similar between "low score" and "high score" provinces, which indicates that opportunistic migration is not the key driving force of differential occupational status. I also compare the proportion of individuals from upper-class families in "high score" and "low score" provinces and the difference is not significant either.

One may also argue that the labour market in "high score" and "low score" provinces are different. It is possible that employers in "high score" provinces appreciate high-school graduates more than those in "low score" provinces, as the high-school graduates in "high score" provinces have higher ability. It would also be possible that the demand for college graduates is higher in "low score" provinces and that is why they lower the minimum score to try to admit more

students into college. Both cases indicate that occupational status in the baseline should be significantly lower in "high score" provinces than "low score" provinces. However, table 2 suggests that this is not the case.

Even though there is no fundamental pretreatment difference in unobserved key characteristics such as the rate of strategic migration and occupational status between "low score" and "high score" provinces in the baseline, we still need to make sure the policy shifts the cost of college degree for marginal students independently of u_{ijt}. Possible confounding factors in u_{ijt} that might change with the college expansion policy include admission rate, composition of high-school students and socio-economic status.

First, although college expansion took place all over China, if "low score" provinces experienced a larger-scale expansion than "high score" provinces, occupational status in "low score" provinces will increase more than that in "high score" provinces even if the college expansion does not benefit marginal students. Table 2 reports the change of key characteristics from pre- to post-expansion period. Statistics show that the change in both the minimum scores[17] and the admission rate (i.e. "college") are not significantly different between "high score" and "low score" provinces. Figure 4 further verifies that the college admission rate increased a lot for the 1979 birth cohort, but this increase does not differ largely between the two types of provinces. This parallel increase suggests that their differential change in occupational status does not result from the difference in the number of students who could get a college degree, but the difference in the ability composition of college graduates.

Insert figure 4 about here

Second, as I restrict the sample to individuals with at least a senior high school degree, the college expansion policy should not affect the ability composition of high school students differently between "low score" and "high score" provinces. Figure A3 reports the proportion of individuals with a senior high school degree only (panel a) and the proportion of individuals with a junior high school degree only (panel b) over all individuals in the same birth cohort for the two types of provinces. There is no clear difference between "low score" and "high score" provinces around the 1979 birth cohort. The overall declining trend is consistent with the fact that more individuals are able to go to college after the expansion.

[17]Here the minimum scores actually increased instead of decreasing from pre- to post-expansion period. This is because in general the minimum scores increase over time as students get adapted to the style of exam questions. Therefore, the college expansion policy should be interpreted as making the minimum score lower than it is supposed to be, instead of lowering the absolute value of minimum score.

Third, in table 2, the change in the rate of opportunistic migration and the proportion of upper-class families from pre- to post-expansion period is not statistically significant between "low score" and "high score" provinces, suggesting that the differential increase in occupational status is not due to differential changes in ability composition between the two types of provinces.

Last but not least, I check if the empirical data is consistent with the assumptions in the theoretical model. The theoretical model assumes that the distribution of ability is the same between "high score" and "low score" provinces and only high-ability individuals can go to college before the college expansion. This gives two implications. First, if the minimum score is lower in "low score" provinces, the proportion of college graduates should be higher in "low score" provinces ($1 - \theta_2 > 1 - \theta_1$). This is verified in table 2. The proportion of college degree holders is 0.36 in "low score" provinces and is 0.23 in "high score" provinces with a p-value of 0.02. Second, if college education is restricted to individuals with high ability ($\theta_1 > \theta_2 > \underline{\theta}$) who anyway get upper-class jobs via nepotism in the pre-expansion period, the proportion of individuals getting upper-class occupations in both types of provinces is not driven by the proportion of college graduates, but by the proportion of individuals with high ability. Given the same ability distribution in those two groups, the proportion of people getting upper-class occupations in the baseline should not be very different between "low score" and "high score" provinces. Table 2 shows that the chance of getting an upper-class job as the first job (or the current job) is similar between the two types of provinces before the college expansion.

5.2 Average college premium for individuals with marginal ability

I do not take logarithm of ISEI scores because theoretically it measures the utility (incorporating both monetary returns like wage and non-monetary returns like prestige) from each occupation, and empirically ISEI is an interval scale with no naturally occurring zero point (Kreidl et al., 2014). The college premium can be interpreted as the increase in the ISEI score as a result of college degree. I also use a dummy variable on whether the occupation belongs to an upper-class occupation as another dependent variable.

In the regression analysis I consider both first and current occupations. On the one hand, it is not common to get the most elite occupations (such as managers, senior government officers or professors) for their first job even if they get the best education or come from families with best resources. However, they may obtain more elite positions at a later stage of their career. Looking only at first occupations may underestimate their potentials in upward mobility. On

the other hand, those who have the motivation to change their jobs may systematically differ from those who stick to their first occupations. Focusing only on current jobs may generate potential selection bias. There are four measures of occupational status: the ISEI score for first or current occupation, and whether or not the first or current jobs is an upper-class job.

Insert figure 5 about here

Figure 5 plots the four measures of occupational status over birth cohorts for provinces with high and low minimum scores. Before the college expansion policy (i.e. the 1979 birth cohort), there is no fundamental difference between "high score" and "low score" provinces in all four measures. Consistent with the theoretical model, after the college expansion, the "low score" provinces consistently have higher occupational status than "high score" provinces. The gap between the two provinces in the post-expansion period captures the average college premium for individuals with marginal ability who would not be able to get an upper-class job without the college expansion. Table 1 and 2 report similar results. Table 1 shows that provinces with lower minimum scores have higher occupational status in all four measures, and table 2 reveals that such difference in occupational status is not in the baseline but occurs after the college expansion. For example, the proportion of individuals who could get an upper-class occupation as the first job is 0.20 in "low score" provinces and 0.23 in "high score" provinces which is not statistically different from each other (p-value =0.26). However, the college expansion policy increased the proportion by 0.12 in "low score" provinces, which is significantly more than the increase in "high score" provinces.

Insert table 3 about here

Results on the college premium for marginal individuals based on the difference-in-difference regressions are reported in table 3. Column 1 tests if there is any differential trend in the college admission rate between "high score" and "low score" provinces. The insignificant interaction term is consistent with the theoretical model and indicates that the differential change in occupational status between the two types of provinces does not result from the difference in the college admission rate, but the ability composition of individuals with a college degree.

Columns 2 - 5 report the results for the four measures of occupational status. The interaction term between the dummy on the province type and the dummy on the policy implementation is positive and significant in almost all measures, indicating that average occupational status

increases more in "low score" provinces than "high score" provinces. According to the theoretical model, the gap between the two provinces captures the college premium for marginal individuals who could go to college and get an upper-class job after the college expansion in "low score" provinces but not "high score" provinces.

For the magnitude of the college premium for marginal individuals, the interaction term in column 3 is 0.095, suggesting the college expansion increases their chance of getting an upper-class job by 9.5 percentage point. According to the theoretical model, this is an estimate of the lower bound of their college premium. The magnitude is similar between the first and current occupations.

To further verify the results, I replicate table 3 by looking at each birth cohort separately, instead of using a dummy on whether one was born in and after 1979. I interact the "low score" province dummy with all birth year dummies from 1976 to 1982. If the college expansion explains the differential change in occupational status between the two types of provinces for later birth cohorts, the interaction terms should be significant staring from the 1979 cohort. The corresponding regression is as follows:

$$Y_{ijt} = \alpha + \sum_{l=1976}^{1982} d_l \zeta_l * D_j + \beta X_i + v_j + w_t + u_{ijt} \tag{10}$$

where ζ_l represent a series of cohort dummies and d_l are the coefficients of interest.

The results are in table 4. Consistent with table 3, none of the interaction terms for college attainment in column 1 is significant. In columns 2 - 5 with all the four measures of occupational status, none of the interaction terms for the birth cohorts between 1976 and 1978 are significant. Furthermore, if the college expansion policy explains the larger increase in occupational status in "low score" provinces than "high sore" provinces, the effect should be the strongest for cohorts born in 1980 and 1981. The majority of high school students in China take the college entrance exam at age 18 and 19 so that the 1980 and 1981 birth cohorts were the most affected by the 1999 expansion policy. This is confirmed by the most significant interaction terms for the 1980 and 1981 birth cohorts in columns 3, 4 and 5.

One concern might be that the birth cohorts taking the college entrance exam in and after 1999 might also be the ones affected by the One Child Policy. It is therefore necessary to show that the change in ability composition of college graduates is due to the college expansion rather than the family planning policy. The One Child Policy resulted in a sharp decline in the number

of children born in the 1970s. This policy may be related to education and labour market in two ways. First, the number of participants in college entrance exams and job markets may largely decline after 1999, which can relax the competition in college entrance exams and job hunting. Second, as children have less siblings in their households, family resources can be more concentrated and they can be taken better care of by their parents, which increases their ability and helps them better prepare for the college entrance exam.

Insert table 4 about here

There are three ways to show the differential increase in occupational status between "high score" and "low score" provinces for cohorts born in 1979 and after is not mainly due to the One Child Policy. Firstly, the One Child Policy is a nationwide policy which affects all provinces. In particular, if the One Child Policy changes the underlying distribution of ability among individuals born in and after 1979 in a non-parallel way between "high score" and "low score" provinces, there should be differential increase in the proportion of college degree holders between the two types of provinces, which contradicts the finding in column 1 in table 3 and 4.

Insert table 5 about here

Secondly, according to Qian (2008), although the One Child Policy was officially launched in 1979, family planning policies in China began with a four-year birth spacing law in the early 1970s. In fact, family planning policies should affect cohorts born in and after 1976. I regress the proportion of college graduates and the four measures of occupational status on each birth cohort starting from 1976. If the One Child Policy drives the story, the birth cohort dummy should be positive and significant from 1976. However, panel A in table 5 reports that the college attainment and occupational status began to improve significantly in 1979, 3 years after the effective year of the family planning policy, which suggests that the college expansion policy is more important than the One Child Policy in determining individuals' college education and occupational status.

Thirdly, as the minority group is not affected by the One Child Policy, if the differential increase in occupational status between the two types of provinces for people born in or after 1979 is mainly due to the One Child Policy, we would expect that the interaction between the province dummy and the 1979 birth cohort dummy is less significant or smaller in magnitude

among the minority group than the Han group. I use a difference-in-difference-in-difference approach by interacting a province dummy, a 1979 birth cohort dummy and a dummy on whether one is from the minority group. In all columns in panel B in table 5, the triple-interaction terms are far from being significant, indicating that there is no significant evidence to prove that the One Child Policy is mainly responsible for the differential increase in occupational status between provinces.

5.3 College premium and intergenerational mobility

The differential increase in occupational status between "high score" and "low score" provinces after the college expansion policy captures the college premium for individuals with marginal ability who would otherwise not have been able to go to college and get an upper-class job had it been no college expansion. Whether or not the college expansion reduces intergenerational persistence depends on where these individuals with marginal ability come from. If those marginal individuals come mostly from non-upper class families, the college expansion policy increases intergenerational mobility by providing those individuals with the opportunity of obtaining college degree to be qualified for upper-class jobs.

Based on equation 9, I use a triple difference approach by interacting the treatment effect in equation 8 with a dummy on whether one comes from an upper-class family. If the marginal individuals mostly come from non-upper class families, the coefficient of the triple interaction term should be negative. The results are in table 6.1. Similar to the result in column 1 in table 3, there is no difference in the increase in college attainment in different provinces between different social classes. Columns 2 - 5 report the results of the triple difference regressions for all four measures of occupational status. The triple interaction term in column 3 is negative and significant, suggesting that the marginal individuals who benefit the most from the college expansion policy are less likely from upper-class families and this expansion policy stimulates intergenerational mobility by helping individuals from less advantaged families get an upper-class job.

In terms of the magnitude, column 3 in table 6.1 suggests that individuals who are not from upper-class families in "low score" provinces have 13 percentage points more increase in the chance of getting an upper-class job as the first occupation than those from "high score" provinces after the college expansion. Coming from upper-class families, however, reduces this increase by 22.3 percentage points.

To further show that $\phi^h \approx 0$ and $\phi^l > 0$, in table 6.2, I conduct regressions for individuals from upper-class and other families, respectively. Consistent with the results in table 6.1, the interaction term between the province dummy and the policy dummy is positive and significant in all four measures of occupational status for those who are not from upper-class families and is insignificant for upper-class individuals. This verifies that the college expansion policy increases intergenerational mobility by improving the occupational status mostly for marginal individuals who mainly come from outside upper-class families. The magnitude of the effect of the college expansion is also similar to that in table 6.1. For example, in column 8 in table 6.2, the college premium for individuals from non-upper class families is 13 percentage points, same as the corresponding number in table 6.1.

Insert table 6.1 and 6.2 about here

6 Robustness Check

6.1 A continuous measure of minimum scores

Instead of dividing all provinces into "high score" and "low score" ones, I use the three-year average of minimum scores before the college expansion policy for each province as a continuous measure of minimum requirements[18]. To be consistent with the "low score" dummy where the dummy equals 1 indicating a lower minimum score, I use one minus the average minimum score for each province so that a higher value of the measure indicates a lower minimum requirement.

Table A4 reports the difference-in-difference results to measure the college premium for marginal students. Similar to the main results in table 3, the college expansion policy does not result in a differential increase in the level of education in provinces with different minimum requirements, but the differential change in the ability composition of college graduates results in the differential increase in the chance of getting an upper-class job.

I also replicate the regressions in table 6.1 and 6.2 using this continuous measure of minimum requirements to see if the college expansion can reduce intergenerational persistence. The results are in table A5.1 and A5.2. The triple interaction term among the continuous measure of minimum requirements, the policy dummy and the dummy on an upper-class background is negative in columns 2 - 5 in table A5.1. Columns 3, 5, 8 and 10 in table A5.2 further reports

[18]The idea is analogous to Li et al. (2017) where they use the provincial share of national college enrollment in 1998 to predict the actual enrolment in 1999, with the assumption that the 1999 college expansion is proportional to the predetermined capacity in each province.

that the college premium for individuals with marginal ability is positive and significant only for individuals from outside upper-class families, verifying that the college expansion policy stimulates intergenerational mobility as individuals from outside upper-class families get the largest benefit.

6.2 More detailed discretisation

I conduct a robustness check which defines social classes from a more nuanced perspective with a more detailed discretisation for two reasons. Firstly, it is to see if the results are sensitive to the choice of the threshold when defining "upper class". Secondly, one may argue that the larger college premium among individuals from less privileged families is due to diminishing marginal returns to ability, not nepotism. If this is true, one may observe that college premium decreases continuously with ability, not just around the threshold between upper-class and other backgrounds.

As ISEI scores range from 16 to 90, I further classify occupational status into 6 groups: $ISEI < 30$, $30 \leq ISEI < 40$, $40 \leq ISEI < 50$, $50 \leq ISEI < 60$, $60 \leq ISEI < 70$, $ISEI \geq 70$. The effect of the college expansion on individuals from different family background is captured by interactions between the treatment effect and fathers' social classes based on this detailed classification instead of a simple upper-class dummy. $ISEI < 30$ is the reference group.

If the main results are robust to the definition of upper class, the interaction terms between the social class dummy and the treatment effects should be negative and significant only in classes with higher occupational status, which is verified in table A6. The interaction terms between social class dummies and the treatment effect are insignificant for all class categories where fathers' ISEI scores are below 60, suggesting that individuals who benefit the most from the college expansion policy systematically come from classes with lower occupational status. Furthermore, the lack of significance in the coefficients of the interaction terms where fathers' ISEI scores are below 60 suggests that the story is not driven by the continuously diminishing returns to ability but the nepotism which leads to a discrete jump in college premium around the watershed between upper-class and other families.

6.3 Possible confounding policies

Although individuals in the sample were born in a short span of time, they may still encounter some other policy changes which will affect their opportunities in job hunting even without the college expansion.

I consider two policies which took place in China after 1978. The first reform in the 1990s is the accelerated process of marketisation. In October 1992, the Communist Party formally endorsed Deng Xiaoping's call for the establishment of a "socialist market economy". A labor law was issued and reforms of state-owned enterprises were announced (Jaggi et al., 1996). All this may have created new job opportunities for individuals who entered the job market after 1993.

This reform is very unlikely to be the confounding policy here. By restricting the sample to individuals born in or after 1975 with at least a senior high school degree, almost all individuals enter the labour market after the reform in 1992 when the oldest cohort just reached the age of 17.

The second reform in the 1990s relates to the urban job allocation system. Before that, the central government controlled the size, growth and allocation of urban jobs for college graduates. After graduating from college, potential candidates were screened by authorities from residences, schools and recruiting organizations and then be assigned occupations and workplaces (Bian, 1997). This planning system was cancelled in 1996 and was completely terminated in all provinces in 1998. As a result, cohorts who entered the job market before the termination of this policy had little freedom in choosing their occupations and can thus be systematically different from those who looked for jobs after that.

In principle this job allocation system does not largely confound the interpretation of empirical results, because only high-school graduates in the earliest cohort who entered the labour market before 1996 (age 20 or 21 in 1996) were affected by the job allocation system. Still I create a dummy on whether one entered the labour market after 1996, and interact it with the treatment effect of the college expansion policy. Panel B in Table A6 reports the results. The interaction terms between the dummy on whether one entered the labour market after 1996 and the treatment effect of the college expansion policy in all four measures of occupational status are insignificant, suggesting the job allocation system does not affect the change in occupational status in "high score" and "low score" provinces in a different way.

6.4 Alternative Explanations

This section rules out three alternative factors that might affect educational attainment and occupational status which are potentially correlated with family background.

The quality of high-school education. Being admitted to an elite college brings about additional returns in the labour market in China (Jia and Li, 2020). It is therefore possible that individuals from different family background have different qualities of education, which results in their difference in college admission and occupational status.

There are two types of key schools for individuals with at least a high school degree. The first one includes key high schools which recruit better teachers with the reputation of better performances in college entrance exams. The second one is defined as key universities. In 1995, the Ministry of Education launched "Project 211" which provided a list of national key universities (around 100) which can be offered preferential policies by the central government. They play the leading role in China's educational system (Yeung, 2013).

I replace the dependent variables in main regressions with a dummy on whether one has attended a key high school and a key university, respectively. CGSS 2003 and 2008 survey collects information on the quality of education each individual has received. The results are in table A7. Columns 1 and 3 look at the chance of going to a key high school while columns 2 and 4 focus on the probability of going to a key university.

Columns 1 and 2 indicate that there is no differential change in the probability of going to a key high school or a key university between different provinces after the college expansion policy. Columns 3 and 4 further verify that the effect in columns 1 and 2 does not differ between individuals from upper-class and other families. There is no enough evidence to suggest that the quality of education explains the differential pattern between provinces and social classes in the main results. This might be because not only college education but also primary and secondary education in China was merit-based in the 1990s.

Increase in tuition fees. From 1995 to 2004, tuition fees increased from 800 RMB per person per year to 5000 RMB per person per year, which resulted in financial constraints for some families (Yeung, 2013).

However, financial constraint is not likely to be the key driving force in this paper. First, I look at the cohorts born in a very short span of time. Most of them had college admission around 1998 and 1999 when the tuition fees for college stayed below 3000. Financial constraint alone is not likely to cause the large difference in the change in occupational status between "high

score" and "low score" provinces. Second, table A6 indicates that this treatment effect largely exists among individuals who are unlikely to suffer from such financial burden (i.e. fathers' ISEI scores are reasonably high).

Motivation in college. It is possible that individuals from less privileged families are motivated to work harder in college and improve their marginal productivity more than upper-class children, which leads to their higher occupational returns. If motivation in college explains the difference in college premium among individuals from different social classes, we should expect that given the same ability and educational level, it is easier for individuals from outside upper-class families to achieve every level of occupational status. But table 6.1 suggest that family background matters mostly at the division between upper-class and other jobs, not any continuous level of ISEI score. This indicates that nepotism, which matters mostly at the division between upper-class and other occupations, should be more important in determining occupational returns to education.

7 Conclusions

This paper investigates how college expansion affects intergenerational occupational mobility by explaining and estimating how the occupational returns to college education differ among different social classes. As nepotism channels individuals from upper-class families into upper-class occupations even without a college degree, occupational returns to education are higher among individuals from less privileged families, indicating that policies aiming at equalising educational attainments among social classes can stimulate intergenerational mobility. In terms of magnitude, college education increases the chance of getting an upper-class job by 9.5% for individuals from less privileged families.

At first glance, this paper seems contradictory to the most recent finding that intergenerational persistence in China is increasing after the college expansion (Fan et al., 2020), but the difference can be reconciled. First, the large increase in intergenerational persistence in Fan et al. (2020) is observed mostly for the 1981 - 1988 birth cohort, most of which are outside my sample. Second, the increase in intergenerational persistence after the 1999 college expansion in Fan et al. (2020) is mainly due to the increase in tuition fees in the most recent years, not the expansion itself. The large increase in the tertiary tuition fee in the 21st century is also reported in Li et al. (2013). As the increasing financial burden can undermine the effect of the

college expansion, by restricting to a short span of window around 1999, this paper disentangles the effect of a merit-based policy change from the effect of the tuition fee. It captures the pure effect of college expansion and has a more clear policy implication.

Some other studies in China have documented that the increase in the supply of college graduates after the college expansion might have slowed down the increase in returns to tertiary education (Xing and Li, 2011; Meng et al., 2013), which do not contradict this paper either. The difference-in-difference framework in this paper makes cross-province and cross-time comparisons. The distinctive features of each province, which largely determine the occupational structure and the demand for college graduates, are controlled by province fixed effects. The changing supply of college graduates over time is largely controlled by birth cohort fixed effects. More importantly, this paper captures the relative returns to college education among individuals from different social classes, not absolute values of college premium over time. For cohorts included in this paper, their returns to college education may not be as high as those who took the college entrance exam in the early 1990s, but the finding in this paper holds as long as the college premium still exists (i.e. occupational status should be higher for college graduates than that for high school graduates with the same ability) and the college premium is larger among individuals from less privileged families.

References

Assaad, R. and M. Saleh (2018). Does improved local supply of schooling enhance intergenerational mobility in education? Evidence from Jordan. *The World Bank Economic Review 32*(3), 633–655.

Becker, G. (1981). *A treatise on the family*. Chicago: University of Chicago Press.

Becker, G. S. and N. Tomes (1979). An equilibrium theory of the distribution of income and intergenerational mobility. *Journal of Political Economy 87*(6), 1153–1189.

Bergman, P., R. Chetty, S. DeLuca, N. Hendren, L. F. Katz, and C. Palmer (2020). Creating moves to opportunity: experimental evidence on barriers to neighborhood choice.

Bertrand, M., M. Mogstad, and J. Mountjoy (2020). Improving educational pathways to social mobility: evidence from Norway's "Reform 94".

Bian, Y. (1997). Bringing strong ties back in: indirect ties, network bridges, and job searches in China. *American Sociological Review 62*(3), 366–385.

Bian, Y. and L. Li (2012). The Chinese General Social Survey (2003-8): sample designs and data evaluation. *Chinese Sociological Review 45*(1), 70–97.

Black, S. E. and P. Devereux (2011). Recent developments in intergenerational mobility. *Handbook of Labor Economics 4*(11), 1487–1541.

Botticini, M. and Z. Eckstein (2006). Path dependence and occupations. *New Palgrave Dictionary of Economics*.

Bowles, S. and H. Gintis (2002). The inheritance of inequality. *The Journal of Economic Perspectives 16*(3), 3–30.

Carneiro, P., C. Meghir, and M. Parey (2013). Maternal Education, Home Environments, and the Development of Children and Adolescents. *Journal of the European Economic Association 11*, 123–160.

Chen, M. (2012). *Intergenerational mobility in contemporary China : 1996-2006*. Phd thesis, University of Manchester.

Chetty, R., J. N. Friedman, N. Hendren, M. R. Jones, and S. R. Porter (2020). The Opportunity Atlas: Mapping the Childhood Roots of Social Mobility.

Chetty, R., J. N. Friedman, E. Saez, N. Turner, and D. Yagan (2020). The determinants of income segregation and intergenerational mobility using test scores to measure undermatching.

Chetty, R. and N. Hendren (2018a). The impacts of neighborhoods on intergenerational mobility I: childhood exposure effects. *Quarterly Journal of Economics 133*(3), 1107–1162.

Chetty, R. and N. Hendren (2018b). The impacts of neighborhoods on intergenerational mobility II: county-level estimates. *Quarterly Journal of Economics 133*(3), 1163–1228.

Chetty, R., N. Hendren, and L. F. Katz (2016). The effects of exposure to better neighborhoods on children: new evidence from the moving to opportunity experiment. *The American Economic Review 106*(4), 855–902.

Chetty, R., N. Hendren, P. Kline, and E. Saez (2014). Where is the land of opportunity? The geography of intergenerational mobility in the United States. *Quarterly Journal of Economics 129*(4), 1553–1623.

Chevalier, A., C. Harmon, I. Walker, and Y. Zhu (2004). Does education raise productivity, or just reflect it? *The Economic Journal 114*, 499–517.

Clark, D. and P. Martorell (2014). The signaling value of a high school diploma. *Journal of Political Economy 122*(2), 282–318.

Corak, M. (2019). The Canadian geography of intergenerational income mobility. *The Economic Journal May*, 1–41.

Currie, J. and E. Moretti (2003). Mother's Education and the Intergenerational Transmission of Human Capital: Evidence from College Openings. *The Quarterly Journal of Economics 118*(4), 1495–1532.

Deng, Z. and D. J. Treiman (1997). The impact of the Cultural Revolution on trends in educational attainment in the People's Republic of China. *American Journal of Sociology 103*(2), 391–428.

Di Pietro, G. and P. Urwin (2003). Intergenerational mobility and occupational status in Italy. *Applied Economics Letters 10*(12), 793–797.

Ermisch, J. and M. Francesconi (2002). Intergenerational mobility in Britain: new evidence from the BHPS. Institute for Social and Economic Research working paper.

Fagereng, A., M. Mogstad, and M. Ronning (2020). Why do wealthy parents have wealthy children? *Journal of Political Economy (forthcoming).*

Fan, Y., J. Yi, and J. Zhang (2020). Rising Intergenerational Income Persistence in China. *American Economic Journal: Economic Policy (forthcoming).*

Fang, H., K. N. Eggleston, J. A. Rizzo, S. Rozelle, and R. J. Zeckhauser (2012). The returns to education in China: evidence from the 1986 compulsory education law. NBER Working Paper.

Ganzeboom, H. B. (1996). Internationally Comparable Measures of Occupational Status for the 1988 International Standard Classification of Occupations. *Social Science Research 239*(25), 201–239.

Ganzeboom, H. B., P. M. De Graaf, D. J. Treiman, and J. De Leeuw (1992). A standard international socio-economic index of occupational status. *Social Science Research 21*, 1–56.

Gensowski, M. and R. Piatek (2015). Skills, occupational choice and educational attainment.

Hnatkovska, V., A. Lahiri, and S. B. Paul (2013). Breaking the caste barrier: intergenerational mobility in India. *The Journal of Human Resources 48*(2), 435–473.

Holmlund, H., M. Lindahl, and E. Plug (2011). The Causal Effect of Parents' Schooling on Children's Schooling: A Comparison of Estimation Methods. *Journal of Economic Literature 49*(3), 615–651.

Jaggi, G., M. Rundle, D. Rosen, and Y. Takahashi (1996). China's economic reforms: chronology and statistics.

Jia, R. and H. Li (2020). Just above the cutoff: the return to elite education in China.

Kreidl, M., H. B. Ganzeboom, and D. J. Treiman (2014). How did occupational returns to education change over time?

Lee, K. (2015). Higher education expansion, tracking, and student effort. *Journal of Econometrics 114*, 1–22.

Lee, Y. S. (2014). Exams, districts, and intergenerational mobility: Evidence from South Korea. *Labour Economics 29*, 62–71.

Li, H., Y. Ma, L. Meng, X. Qiao, and X. Shi (2017). Skill complementarities and returns to higher education: Evidence from college enrollment expansion in China. *China Economic Review 46*, 10–26.

Li, H., L. Meng, X. Shi, and B. Wu (2013). Poverty in China's colleges and the targeting of financial aid. *China Quarterly 216*, 970–992.

Li, L. (2010). The evolution of the minimum scores of college entrance exam and its motivation: the spatial allocation of opportunities of higher education (in Chinese). *Peking University Education Review 8*(2), 56–70.

Li, S., J. Whalley, and C. Xing (2013). China's higher education expansion and unemployment of college graduates. *China Economic Review*.

Lin, N. and Y. Bian (1991). Getting Ahead in Urban China. *American Journal of Sociology 97*(3), 657–688.

Lofstrom, M. and J. Tyler (2008). *Modeling the signaling value of the GED with an application to an exogenous passing standard increase in Texas, in Polachek, S.W. and Tatsiramos, K. (Ed.) Work, Earnings and Other Aspects of the Employment Relation (Research in Labor Economics, Vol. 28)*. Bingley: Emerald Group Publishing Limited.

Long, J. and J. Ferrie (2013). Intergenerational occupational mobility in Great Britain and the United States since 1850. *The American Economic Review 103*(4), 1109–1137.

Magruder, J. R. (2010). Intergenerational networks, unemployment and persistent inequality in South Africa. *American Economic Journal: Applied Economics 2*(1), 62–85.

Maurin, E. and S. McNally (2008). Vive la Revolution! Long-Term Educational Returns of 1968 to the Angry Students. *Journal of Labor Economics 26*(1), 1–33.

Mazumder, B. (2005). Fortunate sons: new estimates of intergenerational mobility in the United States using social security earnings data. *Review of Economics and Statistics 87*(2), 235–255.

Meghir, C. and M. Palme (2005). Educational reform, ability, and family background. *The American Economic Review 96*(1), 414–424.

Mendolia, S. and P. Siminski (2017). Is education the mechanism through which family background affects economic outcomes? A generalised approach to mediation analysis. *Economics of Education Review 59*, 1–12.

Meng, X., K. Shen, and S. Xue (2013). Economic reform, education expansion, and earnings inequality for urban males in China, 1988 -2009. *Journal of Comparative Economics 41*(1), 227–244.

Munshi, K. (2011). Strength in numbers: networks as a solution to occupational traps. *The Review of Economic Studies 78*(3), 1069–1101.

Neal, D. A. and W. R. Johnson (1996). The role of premarket factors in black-white wage differences. *Journal of Political Economy 104*(5), 869–895.

Ng, I. Y., X. Shen, and K. W. Ho (2009). Intergenerational earnings mobility in Singapore and the United States. *Journal of Asian Economics 20*(2), 110–119.

Oreopoulos, P., M. E. Page, and A. H. Stevens (2006). The Intergenerational Effects of Compulsory Schooling. *Journal of Labor Economics 24*(4), 729–760.

Pakpahan, Y. M., D. Suryadarma, and A. Suryahadi (2009). Destined for destitution: intergenerational poverty persistence in Indonesia. SMERU Research Institute working paper.

Pekkarinen, T., R. U. Uusitalo, and S. Kerr (2009). School tracking and intergenerational income mobility: Evidence from the Finnish comprehensive school reform. *Journal of Public Economics 93*, 965–973.

Qian, N. (2008). Missing women and the price of tea in China: the effect of sex-specific earnings on sex imbalance. *The Quarterly Journal of Economics 123*(3), 1251–1285.

Solon, G. (1999). Intergenerational mobility in the labor market. *Handbook of Labor Economics 3*, 1761–1800.

Takenoshita, H. (2007). Intergenerational mobility in East Asian countries: a comparative study of Japan, Korea and China. *International Journal of Japanese Sociology 16*(1), 64–79.

Tyler, J. H., R. J. Murnane, and J. B. Willett (2000). Estimating the labor market signaling value of the GED. *The Quarterly Journal of Economics May*, 431–468.

Wang, E. and K. W. Chan (2005). *Tilting scoreline: geographical inequalities in admission scores to higher education in China, in Cai Fang and Zhang Zhanxin (eds.), Labor Market in China's Transition*. Beijing: China Population Publishing House.

Xie, Y. (2012). China Family Panel Studies (2010) User's Mannual.

Xing, C. and S. Li (2011). Higher education expansion, education opportunity, and unemployment of college graduates. *China Economic Quarterly 10*(4), 1187–1208.

Yeung, W.-J. J. (2013). China's higher education expansion and social stratification. ASIA RESEARCH Institute working paper.

A Appendix. Mathematical Appendix

A.1 Proof of equation 5

As illustrated in figure 1.1, the number of college graduates is $1-\theta_2'+\underline{\theta}-\theta_3'$ and the average occupational status after the college expansion policy becomes:

$$y_L' = \int_0^{\theta_3'} MPL(\theta,NC)+V(L)d\theta+\int_{\theta_3'}^{\underline{\theta}} MPL(\theta,C)+V(H)d\theta+\int_{\underline{\theta}}^{\theta_2'} MPL(\theta,NC)+V(H)d\theta+ \int_{\theta_2'}^{\theta_2} MPL(\theta,C)+V(H)d\theta+\int_{\theta_2}^{1} MPL(\theta,C)+V(H)d\theta \quad (11)$$

Equation 11 - 2 gives:

$$y_L'-y_L = \underbrace{\int_{\theta_2'}^{\theta_2} MPL(\theta,C)-MPL(\theta,NC)d\theta}_{\text{average college premium for high ability individuals}} + \underbrace{\int_{\theta_3'}^{\underline{\theta}} MPL(\theta,C)-MPL(\theta,NC)+V(H)-V(L)d\theta}_{\text{average college premium for individuals with marginal ability}} \quad (12)$$

This provides an estimate of the average college premium of individuals with both high ability (i.e. $\theta \geq \underline{\theta}$) and marginal ability (i.e. $\theta < \underline{\theta}$).

Suppose $\int_a^{a+b} MPL(\theta,C)-MPL(\theta,NC)d\theta = F(a+b)-F(a)$ such that $\frac{\partial F(\theta)}{\partial \theta} = MPL(\theta,C)-MPL(\theta,NC) > 0$. From the condition $\frac{\partial MPL(\theta,C)}{\partial \theta} > \frac{\partial MPL(\theta,NC)}{\partial \theta}$, we have:

$$\frac{\partial^2 F(\theta)}{\partial \theta^2} > 0$$

Since $\frac{\partial F(\theta_2')}{\partial \theta_2'} = \frac{F(\theta_2'+\theta_1-\theta_1')-F(\theta_2')}{\theta_1-\theta_1'}$, $\frac{\partial F(\theta_1')}{\partial \theta_1'} = \frac{F(\theta_1)-F(\theta_1')}{\theta_1-\theta_1'}$ and $\theta_2' < \theta_1'$, the above second order condition gives $F(\theta_2'+\theta_1-\theta_1')-F(\theta_2') < F(\theta_1)-F(\theta_1')$.

Assume the college admission rate increases by the same amount in province 1 and 2, which will be verified by the empirical data. $1-\theta_2'+\underline{\theta}-\theta_3'-(1-\theta_2) = 1-\theta_1'-(1-\theta_1)$. That is, $\theta_2-\theta_2' < \theta_1-\theta_1'$.

Therefore,

$$\int_{\theta_2'}^{\theta_2} MPL(\theta,C)-MPL(\theta,NC)d\theta < \int_{\theta_2'}^{\theta_2'+\theta_1-\theta_1'} MPL(\theta,C)-MPL(\theta,NC)d\theta$$

$$< \int_{\theta_1'}^{\theta_1} MPL(\theta, C) - MPL(\theta, NC) d\theta$$

Equation 12 and 4 gives equation 5:

$$(y_L' - y_L) - (y_H' - y_H) = \int_{\theta_2'}^{\theta_2} MPL(\theta, C) - MPL(\theta, NC) d\theta - \int_{\theta_1'}^{\theta_1} MPL(\theta, C) - MPL(\theta, NC) d\theta$$
$$+ \underbrace{\int_{\theta_3'}^{\underline{\theta}} MPL(\theta, C) - MPL(\theta, NC) + V(H) - V(L) d\theta}_{\text{average college premium for individuals with marginal ability}}$$
$$< \underbrace{\int_{\theta_3'}^{\underline{\theta}} MPL(\theta, C) - MPL(\theta, NC) + V(H) - V(L) d\theta}_{\text{average college premium for individuals with marginal ability}}$$

A.2 Proof of equation 6

As illustrated in figure 1.2, the number of college graduates is $1-\theta_2'$ and the average occupational status after the college expansion policy becomes:

$$y_L' = \int_0^{\theta_2'} MPL(\theta, NC) + V(L) d\theta + \int_{\theta_2'}^{\underline{\theta}} MPL(\theta, C) + V(H) d\theta + \int_{\underline{\theta}}^{\theta_2} MPL(\theta, C) + V(H) d\theta$$
$$+ \int_{\theta_2}^{1} MPL(\theta, C) + V(H) d\theta \quad (13)$$

Equation 13 - 2 gives:

$$y_L' - y_L = \underbrace{\int_{\underline{\theta}}^{\theta_2} MPL(\theta, C) - MPL(\theta, NC) d\theta}_{\text{average college premium for high ability individuals}} + \underbrace{\int_{\theta_2'}^{\underline{\theta}} MPL(\theta, C) - MPL(\theta, NC) + V(H) - V(L) d\theta}_{\text{average college premium for individuals with marginal ability}} \quad (14)$$

This provides an estimate of the average college premium of individuals with both high ability (i.e. $\theta \geq \underline{\theta}$) and marginal ability (i.e. $\theta < \underline{\theta}$).

Again, assume the college admission rate increases by the same amount in province 1 and 2: $1 - \theta_2' - (1 - \theta_2) = 1 - \theta_1' - (1 - \theta_1)$. That is, $\theta_2 - \underline{\theta} < \theta_1 - \theta_1'$.

Similar to case 1, we have:

$$\int_{\underline{\theta}}^{\theta_2} MPL(\theta, C) - MPL(\theta, NC)d\theta < \int_{\theta_1'}^{\theta_1} MPL(\theta, C) - MPL(\theta, NC)d\theta$$

Equation 14 and 4 gives equation 6:

$$\begin{aligned}(y_L' - y_L) - (y_H' - y_H) = &\int_{\underline{\theta}}^{\theta_2} MPL(\theta, C) - MPL(\theta, NC)d\theta - \int_{\theta_1'}^{\theta_1} MPL(\theta, C) - MPL(\theta, NC)d\theta \\ &+ \underbrace{\int_{\theta_2'}^{\underline{\theta}} MPL(\theta, C) - MPL(\theta, NC) + V(H) - V(L)d\theta}_{\text{average college premium for individuals with marginal ability}} \\ &< \underbrace{\int_{\theta_2'}^{\underline{\theta}} MPL(\theta, C) - MPL(\theta, NC) + V(H) - V(L)d\theta}_{\text{average college premium for individuals with marginal ability}}\end{aligned}$$

A.3 Proof of equation 7

As illustrated in figure 1.3, the number of college graduates is $1-\theta_2'$ and the average occupational status after the college expansion policy becomes:

$$y_L' = \int_0^{\underline{\theta}} MPL(\theta, NC) + V(L)d\theta + \int_{\underline{\theta}}^{\theta_2'} MPL(\theta, NC) + V(H)d\theta + \int_{\theta_2'}^{1} MPL(\theta, C) + V(H)d\theta \tag{15}$$

Equation 15 - 2 gives:

$$y_L' - y_L = \underbrace{\int_{\theta_2'}^{\theta_2} MPL(\theta, C) - MPL(\theta, NC)d\theta}_{\text{average college premium for high ability individuals}} \tag{16}$$

Unlike the above two cases, this only provides an estimate of the average college premium of individuals with high ability (i.e. $\theta > \underline{\theta}$).

Similarly, we have:

$$\int_{\theta_2'}^{\theta_2} MPL(\theta, C) - MPL(\theta, NC)d\theta < \int_{\theta_1'}^{\theta_1} MPL(\theta, C) - MPL(\theta, NC)d\theta$$

Equation 16 and 4 gives equation 7:

$$(y'_L - y_L) - (y'_H - y_H) = \int_{\theta'_2}^{\theta_2} MPL(\theta, C) - MPL(\theta, NC) d\theta - \int_{\theta'_1}^{\theta_1} MPL(\theta, C) - MPL(\theta, NC) d\theta < 0$$

A.4 A model without nepotism

Without nepotism, individuals from both upper-class and other families need a college degree to obtain an upper-class job: $MPL(\theta, C) \geq \underline{MPL} > MPL(\theta, NC)$. They choose college education if $MPL(\theta, C) + V(H) - C(\theta, C) > MPL(\theta, NC) + V(L)$.

As illustrated in figure A0, after the college expansion, the number of college graduates increases by $\theta_2 - \theta'_2$ in a province with a low minimum score and the average occupational status increases by:

$$y'_L - y_L = \int_{\theta'_2}^{\theta_2} MPL(\theta, C) - MPL(\theta, NC) + V(H) - V(L) d\theta$$

Similarly, in a province with a high minimum score, the number of college graduates increases by $\theta_1 - \theta'_1$ and the average occupational status increases by:

$$y'_H - y_H = \int_{\theta'_1}^{\theta_1} MPL(\theta, C) - MPL(\theta, NC) + V(H) - V(L) d\theta$$

Assuming the college admission rate increases by the same amount in provinces with high and low minimum scores: $\theta_2 - \theta'_2 = \theta_1 - \theta'_1$:

$$\int_{\theta'_2}^{\theta_2} MPL(\theta, C) - MPL(\theta, NC) + V(H) - V(L) d\theta < \int_{\theta'_1}^{\theta_1} MPL(\theta, C) - MPL(\theta, NC) + V(H) - V(L) d\theta$$

A difference-in-difference framework gives:

$$(y'_L - y_L) - (y'_H - y_H) = \int_{\theta'_2}^{\theta_2} MPL(\theta, C) - MPL(\theta, NC) + V(H) - V(L) d\theta - \int_{\theta'_1}^{\theta_1} MPL(\theta, C) - MPL(\theta, NC) + V(H) - V(L) d\theta < 0$$

This indicates that the increase in average college premium in the province with a low minimum score should be smaller than that in the province with a high minimum score. The

following empirical results will show it is not the case in reality.

A.5 Alternative theories

My whole model follows the literature that education improves human capital. Another strand of literature focuses on the signalling effect of education (Tyler et al., 2000; Chevalier et al., 2004; Lofstrom and Tyler, 2008; Clark and Martorell, 2014). That is, instead of increasing productivity, a college degree serves as a signal for employers who cannot directly observe ability to select the qualified employees.

In my model, the admission rate increases by the same amount in provinces with low and high minimum scores. If higher occupational status among college graduates than high school graduates mainly results from the signalling effect of a college degree, we should observe either of the following: a) if there is no nepotism, we would see an increase in the average occupational status after the college expansion, but such an increase would not be significantly different between provinces with high and low minimum scores; b) if there is nepotism, individuals from upper-class families will lack the incentive to pursue college education. The empirical findings show that both contradict the reality.

B Appendix. Verifying the Threshold for the Division of Social Classes

Comparing the ISEI scores with another scale for social classification can help verify the threshold which divides the upper-class and other families.

The most comparable scale to the ISEI scale is the EGP scheme which classifies occupations into 10 categories, including: 1. higher service such as professionals, large enterprise employers and higher managers; 2. lower service such as associate professionals, lower managers and higher sales; 3. routine clerical/sales workers; 4. small employers such as small entrepreneurs; 5. independent own account workers with no employees; 6. manual foremen such as manual workers with supervisory status; 7. skilled manual workers such as craft workers, some skilled service and skilled machine operators; 8. semi-unskilled manual workers such as machine operators, elementary laborers, elementary sales and services; 9. farm workers such as employed farm workers irrespective of skill level and family farm workers; 10. farmers/farm managers, self-

employed and supervisory farm workers irrespective of skill level (Ganzeboom, 1996)[19].

I map the ISCO-88 code into EGP categories so that each occupation is assigned to a unique category in EGP. I then calculate the average ISEI scores for each of the 10 EGP categories. The results are in table A2. Individuals defined as "higher controllers" have an average ISEI score of 73 while agricultural workers only have an average ISEI score of 23. Category 6 (manual foremen such as manual workers with supervisory status) is missing in China's context, which is in consistent with the current studies of occupational status based on CGSS data (Chen, 2012).

According to Ganzeboom (1996), categories 1 and 2 are defined as upper class occupations, which has been widely accepted. As a result, the threshold of ISEI scores for the division between upper and non-upper classes should be around 59. The distribution of average ISEI scores across each EGP category further verifies this threshold. There is a huge gap in mean ISEI scores between lower-upper class (ISEI score is 59) and the top level of other classes (ISEI score is 43). Among non-upper-class occupations, gaps exist but are very small across categories.

[19]I use the EGP scheme to get an indication of social class divisions instead of using it for the main analysis because the EGP is less related to economic status. The EGP measure is also very rough and can be misleading for a few occupations in China's context. For example, registered nurses and registered midwives have lower educational attainments and occupational standing than numerical clerks, but the former one is classified into category 2 (which represents an upper-class job) while the latter one is in category 3 (which means it is a middle class job). In addition, a more precise definition of EGP categories requires information on the number of subordinates and supervisory status which is missing in CGSS data.

Table 1. Summary statistics of occupational status

	First occu ISEI		First Upper		Current occu ISEI		Current Upper	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Overall	48.28	15.49	0.23	0.42	48.7	15.43	0.24	0.42
Father ISEI								
upper	50.57	16.61	0.29	0.46	50.98	15.88	0.29	0.45
others	47.77	15.39	0.21	0.41	48.1	15.37	0.22	0.42
Education								
senior high school	42.1	12.83	0.09	0.29	42.63	12.99	0.11	0.31
college	57.28	14.59	0.42	0.49	57.63	14.36	0.42	0.49
College entrance exam								
low standard	48.93	15.43	0.24	0.42	49.27	15.43	0.24	0.43
high standard	47.53	15.53	0.22	0.41	48.04	15.41	0.23	0.42

Note: The table presents summary statistics of occupational status for first and current occupations in CGSS data 2003, 2005, 2006, 2008, 2010, 2011, 2012, 2013 and 2015. Standard errors are in parentheses. First occupation ISEI refers to the ISEI scores for the first job. "Upper" is a dummy on whether one's first occupation is an upper-class job.

Table 2. Balance test

	before 1999				change from pre- to post-1999			
	low	high	diff	p-value	low	high	diff	p-value
minimum score								
minimum score arts	0.62	0.69	-0.07	0.00	0.04	0.03	0.02	0.10
minimum score science	0.65	0.72	-0.07	0.00	0.01	0.00	0.01	0.21
socio-economic status								
college	0.36	0.23	0.13	0.02	0.16	0.12	0.04	0.22
first ISEI	47.86	47.12	0.74	0.35	3.92	0.59	3.33	0.12
first upper	0.20	0.23	-0.02	0.26	0.12	-0.03	0.15	0.02
ISEI	48.21	47.59	0.62	0.37	4.24	0.59	3.65	0.10
upper	0.20	0.24	-0.04	0.18	0.12	-0.04	0.16	0.02
migration	0.08	0.06	0.02	0.35	-0.04	0.00	-0.04	0.22
social class								
father upper	0.17	0.17	0.00	0.46	-0.04	-0.04	0.00	0.48

Note: The table presents summary statistics of the minimum scores for exams, socio-economic status and the proportion of individuals from upper-class families for provinces with low and high minimum requirements. The table includes the statistics both for the baseline (before 1999) and the change from 1998 to 1999. Difference between the two types of provinces and the corresponding p-values are also reported.

Table 3. Difference-in-difference regressions on college degree and occupational status

VARIABLES	[1] College	[2] First ISEI	[3] First upper	[4] ISEI	[5] Upper
low * after	-0.019	1.929	0.095**	2.618*	0.097**
	(0.040)	(1.263)	(0.036)	(1.326)	(0.036)
female	-0.030	0.727	-0.029	0.518	-0.024
	(0.021)	(0.756)	(0.022)	(0.666)	(0.021)
minority	-0.053	-2.332	-0.050	-2.063	-0.036
	(0.043)	(1.673)	(0.033)	(1.666)	(0.041)
father birth year	0.003	0.128**	0.003**	0.042	0.001
	(0.002)	(0.058)	(0.001)	(0.059)	(0.002)
father party member	0.156***	3.245***	0.055**	3.178***	0.050**
	(0.024)	(0.838)	(0.023)	(0.777)	(0.022)
constant	-4.759	-204.866*	-6.322**	-36.874	-1.956
	(3.107)	(113.814)	(2.494)	(114.442)	(3.094)
birth year FE	YES	YES	YES	YES	YES
province FE	YES	YES	YES	YES	YES
survey year FE	YES	YES	YES	YES	YES
observations	2,035	1,686	1,686	1,700	1,700
R-squared	0.090	0.029	0.020	0.026	0.022
number of province	30	30	30	30	30

Note: The key variable is the interaction between the dummy on whether one took the college entrance exam after the college expansion policy was implemented and whether one was from the province with low minimum exam scores for college entrance. The dependent variables include whether an individual has a college degree (column 1) and the individual's occupational status of both first occupation (columns 2 and 3) and current occupation (columns 4 and 5). Individuals born between 1975 and 1982 with at least a senior high school degree are included in the sample. All regressions include birth cohort fixed effects, province fixed effects and survey year fixed effects. Parental characteristics are added as additional determinants, including father's year of birth and father's party membership. Robust standard errors are calculated. *** p<0.01, ** p<0.05, * p<0.1.

Table 4. Difference-in-difference regressions on college degree and occupational status for each cohort

VARIABLES	[1] College	[2] First ISEI	[3] First upper	[4] ISEI	[5] Upper
low * 1976	0.054	-1.696	-0.054	-1.497	-0.050
	(0.076)	(3.271)	(0.093)	(2.545)	(0.074)
low * 1977	0.111	-2.220	-0.021	0.288	0.029
	(0.070)	(2.590)	(0.072)	(2.589)	(0.071)
low * 1978	0.095	1.725	0.099	1.654	0.045
	(0.071)	(3.402)	(0.095)	(3.128)	(0.089)
low * 1979	-0.002	-2.953	0.009	0.048	0.059
	(0.056)	(2.700)	(0.087)	(2.473)	(0.074)
low * 1980	0.029	3.690	0.155*	4.635*	0.130
	(0.069)	(2.846)	(0.083)	(2.653)	(0.077)
low * 1981	0.063	3.442	0.187**	3.931	0.174**
	(0.084)	(2.817)	(0.075)	(3.071)	(0.083)
low * 1982	0.112	1.462	0.065	2.349	0.060
	(0.083)	(3.112)	(0.094)	(3.148)	(0.093)
female	-0.029	0.759	-0.027	0.555	-0.022
	(0.021)	(0.744)	(0.021)	(0.651)	(0.021)
minority	-0.053	-2.499	-0.056	-2.154	-0.039
	(0.042)	(1.698)	(0.034)	(1.701)	(0.042)
father birth year	0.002	0.125**	0.003**	0.039	0.001
	(0.002)	(0.056)	(0.001)	(0.057)	(0.002)
father party member	0.156***	3.229***	0.054**	3.152***	0.048**
	(0.024)	(0.852)	(0.023)	(0.788)	(0.022)
constant	-4.436	-199.751*	-6.033**	-30.414	-1.787
	(3.034)	(109.377)	(2.444)	(110.783)	(3.106)
birth year FE	YES	YES	YES	YES	YES
province FE	YES	YES	YES	YES	YES
survey year FE	YES	YES	YES	YES	YES
observations	2,035	1,686	1,686	1,700	1,700
R-squared	0.092	0.033	0.026	0.028	0.024
number of province	30	30	30	30	30

Note: The key variables are the interaction terms between the dummies on each birth cohort and whether one was from the province with low minimum exam scores for college entrance. The dependent variables include whether an individual has a college degree (column 1) and the individual's occupational status of both first occupation (columns 2 and 3) and current occupation (columns 4 and 5). Individuals born between 1975 and 1982 with at least a senior high school degree are included in the sample. All regressions include birth cohort fixed effects, province fixed effects and survey year fixed effects. Parental characteristics are added as additional determinants, including father's year of birth and father's party membership. Robust standard errors are calculated. *** p<0.01, ** p<0.05, * p<0.1.

Table 5. Test on the identification strategy

VARIABLES	[1] College	[2] First ISEI	[3] First upper	[4] ISEI	[5] Upper
Panel A: Educational attainment for birth cohort					
1976	0.018	0.120	0.015	1.351	0.051
	(0.041)	(1.681)	(0.049)	(1.349)	(0.040)
1977	0.001	0.617	0.006	1.066	0.024
	(0.039)	(1.359)	(0.037)	(1.371)	(0.039)
1978	0.045	0.201	0.015	0.551	0.024
	(0.038)	(1.779)	(0.052)	(1.655)	(0.049)
1979	0.101***	1.557	0.039	2.203*	0.078*
	(0.031)	(1.331)	(0.044)	(1.240)	(0.042)
1980	0.118***	2.840*	0.069	3.517**	0.090**
	(0.035)	(1.417)	(0.045)	(1.422)	(0.042)
1981	0.157***	2.903*	0.080*	3.654**	0.094*
	(0.043)	(1.505)	(0.044)	(1.623)	(0.047)
1982	0.242***	4.021**	0.063	4.774***	0.087
	(0.038)	(1.631)	(0.052)	(1.678)	(0.053)
Panel B: Minority					
minority * low * after	0.218	-2.685	0.075	-4.506	0.043
	(0.161)	(8.729)	(0.155)	(8.652)	(0.179)
minority * after	-0.133	1.077	-0.039	0.743	-0.016
	(0.124)	(7.430)	(0.116)	(6.988)	(0.128)
minority * low	-0.024	0.072	-0.053	0.918	0.019
	(0.123)	(6.647)	(0.122)	(6.400)	(0.134)
low * after	-0.031	2.089*	0.091**	2.899**	0.094**
	(0.039)	(1.190)	(0.035)	(1.244)	(0.035)
control variables	YES	YES	YES	YES	YES
province FE	YES	YES	YES	YES	YES
survey year FE	YES	YES	YES	YES	YES
observations	2,035	1,686	1,686	1,700	1,700
number of province	30	30	30	30	30

Note: In panel A, I regress the probability of getting a college degree and occupational status on birth year dummy variables for all birth cohorts from 1976 to 1982, including the cohorts between the implementations of the One Child Policy and the college expansion policy, to see if the One Child Policy can solely explain the increase in educational achievements and occupational status of later birth cohorts in the sample. In Panel B, I interact the treatment effect with a minority dummy. As the minority are not affected by the One Child Policy, if the One Child Policy can solely explain the increase in educational achievements of later birth cohorts in the sample, we should expect the interaction term to be negatively significant. Robust standard errors are calculated.*** p<0.01, ** p<0.05, * p<0.1.

Table 6.1. Treatment effect of the college expansion policy: how family background makes a difference

VARIABLES	[1] College	[2] First ISEI	[3] First upper	[4] ISEI	[5] Upper
upper * low * after	0.024	-6.652	-0.223*	-4.349	-0.201
	(0.111)	(4.507)	(0.124)	(4.471)	(0.134)
upper * low	0.000	1.036	0.100	0.028	0.114
	(0.083)	(3.538)	(0.072)	(3.541)	(0.081)
upper * after	-0.006	5.941*	0.179*	4.279	0.178**
	(0.040)	(3.217)	(0.094)	(2.793)	(0.085)
low * after	0.008	3.332**	0.130***	3.620**	0.133***
	(0.051)	(1.250)	(0.039)	(1.465)	(0.039)
upper	0.060	1.307	-0.001	1.922	-0.026
	(0.044)	(2.575)	(0.050)	(2.454)	(0.049)
female	-0.006	1.358	-0.012	1.248	-0.013
	(0.028)	(0.840)	(0.023)	(0.751)	(0.020)
minority	-0.100*	-3.602**	-0.081**	-2.991	-0.061
	(0.049)	(1.558)	(0.033)	(1.784)	(0.040)
father birth year	0.001	0.102	0.003	0.002	-0.000
	(0.002)	(0.081)	(0.002)	(0.076)	(0.002)
father party member	0.142***	2.928***	0.044*	2.684***	0.041*
	(0.028)	(0.949)	(0.025)	(0.861)	(0.024)
constant	-2.710	-155.818	-5.049	40.559	0.827
	(3.722)	(158.443)	(3.846)	(147.099)	(4.115)
birth year FE	YES	YES	YES	YES	YES
province FE	YES	YES	YES	YES	YES
survey year FE	YES	YES	YES	YES	YES
observations	1,565	1,409	1,409	1,426	1,426
R-squared	0.094	0.043	0.028	0.038	0.028
number of province	30	30	30	30	30

Note: The key variable is the interaction between the dummy on whether one's father has an upper-class job, the dummy on whether one took the college entrance exam after the college expansion policy was implemented and whether one was from the province with low minimum exam scores for college entrance. The dependent variables include whether an individual has a college degree (column 1) and the individual's occupational status of both first occupation (columns 2 and 3) and current occupation (columns 4 and 5). Individuals born between 1975 and 1982 with at least a senior high school degree are included in the sample. All regressions include birth cohort fixed effects, province fixed effects and survey year fixed effects. Parental characteristics are added as additional determinants, including father's year of birth and father's party membership. Robust standard errors are calculated. *** p<0.01, ** p<0.05, * p<0.1.

Table 6.2. Treatment effect of the college expansion policy: split the sample based on family background

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
			Father upper					Father other		
VARIABLES	College	First ISEI	First upper	ISEI	Upper	College	First ISEI	First upper	ISEI	Upper
low * after	-0.097	-5.114	-0.134	-1.799	-0.096	0.016	3.340**	0.131***	3.799**	0.137***
	(0.119)	(4.813)	(0.124)	(4.295)	(0.133)	(0.050)	(1.283)	(0.040)	(1.437)	(0.040)
female	0.022	-0.642	-0.056	-1.596	-0.074	-0.014	1.561	-0.006	1.586	-0.007
	(0.065)	(2.295)	(0.074)	(2.160)	(0.068)	(0.029)	(1.028)	(0.026)	(0.941)	(0.024)
minority	-0.213*	-6.736	-0.184	-5.125	-0.160	-0.079	-3.329	-0.065	-3.043	-0.043
	(0.116)	(3.965)	(0.169)	(3.036)	(0.142)	(0.068)	(2.026)	(0.044)	(2.349)	(0.059)
father birth year	0.004	0.349	0.008	0.219	0.007	0.002	0.060	0.002	-0.044	-0.002
	(0.005)	(0.255)	(0.007)	(0.166)	(0.005)	(0.002)	(0.087)	(0.002)	(0.091)	(0.002)
father party member	0.057	1.851	0.006	2.620	0.032	0.150***	2.877**	0.045	2.350**	0.030
	(0.059)	(2.595)	(0.069)	(2.300)	(0.068)	(0.032)	(1.106)	(0.028)	(1.052)	(0.029)
constant	-7.678	-634.096	-16.038	-375.622	-13.904	-3.290	-74.190	-3.243	131.110	3.881
	(8.933)	(497.498)	(14.263)	(320.312)	(9.866)	(4.837)	(169.647)	(4.253)	(177.291)	(4.776)
birth year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
province FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
survey year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
observations	258	238	238	243	243	1,307	1,171	1,171	1,183	1,183
R-squared	0.166	0.137	0.089	0.113	0.087	0.091	0.039	0.026	0.037	0.029
number of province	28	28	28	28	28	30	30	30	30	30

Note: The key variable is the interaction between the dummy on whether one took the college entrance exam after the college expansion policy was implemented and whether one was from the province with low minimum exam scores for college entrance. I conduct regressions for individuals from upper-class and other families, respectively. The dependent variables include whether an individual has a college degree (column 1) and the individual's occupational status of both first occupation (columns 2 and 3) and current occupation (columns 4 and 5). Individuals born between 1975 and 1982 with at least a senior high school degree are included in the sample. All regressions include birth cohort fixed effects, province fixed effects and survey year fixed effects. Parental characteristics are added as additional determinants, including father's year of birth and father's party membership. Robust standard errors are calculated. *** p<0.01, ** p<0.05, * p<0.1.

Table A1. Summary statistics of CGSS data

		2003	2005	2006	2008	2010	2011	2012	2013	2015
Demographics										
Age	Mean	31.27	26.38	27.5	27.79	29.39	31.59	33.21	34.59	36.29
	SD	3.81	1.13	1.72	2.01	2.34	2.38	2.34	2.31	2.23
Female	Mean	0.5	0.47	0.51	0.51	0.47	0.48	0.51	0.5	0.51
	SD	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Socio-economic status										
State	Mean	0.42	0.38	0.44	0.53	0.4	0.37	0.4	0.41	0.47
	SD	0.49	0.49	0.5	0.5	0.49	0.48	0.49	0.49	0.5
Income	Mean	33320.89	9834.06	19238.39	22046.69	23889.68	35596.55	42222.83	46040.27	44452
	SD	47504.1	7579.88	30687.05	29143.02	19662.62	48274.44	43898.04	52825.82	72936.63
College	Mean	0.39	0.21	0.25	0.29	0.31	0.46	0.53	0.46	0.37
	SD	0.49	0.41	0.44	0.45	0.46	0.5	0.5	0.5	0.48
Party member	Mean	0.13	0.08	0.07	0.07	0.13	0.18	0.19	0.17	0.14
	SD	0.34	0.28	0.26	0.25	0.34	0.38	0.39	0.38	0.34

Note: The table presents summary statistics of CGSS data 2003, 2005, 2006, 2008, 2010, 2011, 2012, 2013 and 2015, with both the mean value and the standard error. Socio-economics status of individuals include: if they work in the state-owned sectors, income, schooling and communist party membership.

Table A2. Comparisons between ISEI and EGP

	Mean ISEI	SD
EGP classification		
Upper class in EGP scheme		
Higher controllers	72.81	7.37
Lower controllers	58.76	8.08
Other classes in EGP scheme		
Routine non-manual	39.83	7.36
Self-employed with employees	42.72	6.58
Self-employed without employees	30.29	5.96
Skilled manual	33.59	4.66
Semi-unskilled manual	28.62	5.2
Agricultural labourers	23.06	0.82
Self-employed agricultural workers	21.11	4.09

Note: The table presents the mean value and standard deviation of father's ISEI scores in each social class category. Classifications and definition of the two classes (upper and other classes) are based on the EGP scheme. Data sourse: CGSS data 2003, 2005, 2006, 2008, 2010, 2011, 2012, 2013 and 2015.

Table A3.1. Transition matrices of occupations: probability of ending up in an occupation

	Principal	Professional	Associate professional	Clerks	Service	Skilled agri	Craft	Operator	Elementary
Principal	0.12	0.16	0.15	0.12	0.16	0.07	0.11	0.07	0.04
Professional	0.08	0.27	0.11	0.11	0.14	0.07	0.12	0.07	0.04
Associate professional	0.09	0.15	0.17	0.13	0.13	0.09	0.1	0.07	0.06
Clerks	0.07	0.14	0.12	0.18	0.14	0.07	0.13	0.09	0.05
Service	0.08	0.12	0.09	0.11	0.26	0.16	0.09	0.05	0.04
Skilled agri	0.08	0.1	0.07	0.09	0.19	0.15	0.13	0.09	0.11
Craft	0.05	0.1	0.08	0.1	0.17	0.03	0.28	0.12	0.07
Operator	0.06	0.11	0.1	0.11	0.17	0.02	0.17	0.19	0.07
Elementary	0.07	0.09	0.08	0.1	0.19	0.02	0.17	0.14	0.14

Note: Transition matrices of occupations which reflect occupational mobility from father to children. The table is based on the probability of ending up in an occupation. Data source: CGSS 2003, 2005, 2006, 2008, 2010, 2011, 2012, 2013 and 2015.

Table A3.2. Transition matrices of occupations: odds ratio

	Principal	Professional	Associate professional	Clerks	Service	Skilled agri	Craft	Operator	Elementary
Principal	NA	2.53	1.51	2.57	2.44	3.21	6.11	5.43	6.00
Professional	2.53	NA	2.78	3.16	4.18	5.79	6.30	6.66	10.50
Associate professional	1.51	2.78	NA	1.96	3.78	4.05	5.95	4.61	4.96
Clerks	2.57	3.16	1.96	NA	3.04	4.29	3.88	3.45	5.04
Service	2.44	4.18	3.78	3.04	NA	1.28	4.76	5.81	4.79
Skilled agri	3.21	5.79	4.05	4.29	1.28	NA	10.77	15.83	9.55
Craft	6.11	6.30	5.95	3.88	4.76	10.77	NA	2.61	3.11
Operator	5.43	6.66	4.61	3.45	5.81	15.83	2.61	NA	2.71
Elementary	6.00	10.50	4.96	5.04	4.79	9.55	3.11	2.71	NA

Note: Transition matrices of occupations which reflect occupational mobility from father to children. The table is based on odds ratio. Data source: CGSS 2003, 2005, 2006, 2008, 2010, 2011, 2012, 2013 and 2015.

Table A4. Difference-in-difference regressions on college degree and occupational status: a continuous measure of minimum scores

VARIABLES	[1] College	[2] First ISEI	[3] First upper	[4] ISEI	[5] Upper
low score * after	-0.480	13.891	0.879*	19.221	0.924*
	(0.675)	(16.858)	(0.514)	(16.539)	(0.462)
female	-0.030	0.740	-0.028	0.536	-0.023
	(0.021)	(0.757)	(0.022)	(0.669)	(0.021)
minority	-0.054	-2.341	-0.050	-2.073	-0.036
	(0.043)	(1.682)	(0.034)	(1.685)	(0.042)
father birth year	0.003	0.129**	0.003**	0.044	0.001
	(0.002)	(0.059)	(0.001)	(0.059)	(0.002)
father party member	0.156***	3.220***	0.054**	3.147***	0.049**
	(0.024)	(0.832)	(0.023)	(0.770)	(0.022)
constant	-4.763	-206.333*	-6.372**	-39.611	-2.024
	(3.097)	(114.049)	(2.501)	(114.438)	(3.088)
birth year FE	YES	YES	YES	YES	YES
province FE	YES	YES	YES	YES	YES
survey year FE	YES	YES	YES	YES	YES
observations	2,035	1,686	1,686	1,700	1,700
R-squared	0.090	0.028	0.018	0.025	0.020
number of province	30	30	30	30	30

Note: The key variable is the interaction between the dummy on whether one took the college entrance exam after the college expansion policy was implemented and a continuous measure of minimum exam scores for college entrance. The dependent variables include whether an individual has a college degree (column 1) and the individual's occupational status of both first occupation (columns 2 and 3) and current occupation (columns 4 and 5). Individuals born between 1975 and 1982 with at least a senior high school degree are included in the sample. All regressions include birth cohort fixed effects, province fixed effects and survey year fixed effects. Parental characteristics are added as additional determinants, including father's year of birth and father's party membership. Robust standard errors are calculated. *** p<0.01, ** p<0.05, * p<0.1.

Table A5.1. Treatment effect of the college expansion policy with a continuous measure of minimum scores: how family background makes a difference

VARIABLES	[1] College	[2] First ISEI	[3] First upper	[4] ISEI	[5] Upper
upper * low score * after	1.572	-67.854	-2.160	-36.967	-1.540
	(1.485)	(49.347)	(1.644)	(50.711)	(1.752)
upper * low score	-0.624	8.793	1.084	-3.827	1.197
	(1.258)	(46.972)	(0.951)	(42.411)	(0.997)
upper * after	-0.513	24.720	0.768	14.127	0.575
	(0.463)	(16.382)	(0.553)	(16.335)	(0.569)
low score * after	-0.040	28.127	1.199*	27.525	1.238**
	(0.685)	(16.609)	(0.617)	(19.514)	(0.588)
upper	0.266	-1.039	-0.303	3.162	-0.358
	(0.397)	(15.368)	(0.310)	(13.726)	(0.318)
female	-0.006	1.396	-0.011	1.274	-0.013
	(0.028)	(0.848)	(0.024)	(0.762)	(0.021)
minority	-0.097*	-3.569**	-0.080**	-2.964	-0.059
	(0.050)	(1.554)	(0.033)	(1.789)	(0.040)
father birth year	0.002	0.104	0.003	0.004	-0.000
	(0.002)	(0.081)	(0.002)	(0.076)	(0.002)
father party member	0.142***	2.891***	0.043*	2.640***	0.040
	(0.028)	(0.942)	(0.025)	(0.851)	(0.024)
constant	-2.791	-159.425	-5.034	37.904	0.901
	(3.746)	(157.158)	(3.802)	(146.895)	(4.067)
birth year FE	YES	YES	YES	YES	YES
province FE	YES	YES	YES	YES	YES
survey year FE	YES	YES	YES	YES	YES
observations	1,565	1,409	1,409	1,426	1,426
R-squared	0.095	0.041	0.025	0.035	0.025
number of province	30	30	30	30	30

Note: The key variable is the interaction between the dummy on whether one's father has an upper-class job, the dummy on whether one took the college entrance exam after the college expansion policy was implemented and a continuous measure of minimum exam scores for college entrance. The dependent variables include whether an individual has a college degree (column 1) and the individual's occupational status of both first occupation (columns 2 and 3) and current occupation (columns 4 and 5). Individuals born between 1975 and 1982 with at least a senior high school degree are included in the sample. All regressions include birth cohort fixed effects, province fixed effects and survey year fixed effects. Parental characteristics are added as additional determinants, including father's year of birth and father's party membership. Robust standard errors are calculated. *** p<0.01, ** p<0.05, * p<0.1.

Table A5.2. Treatment effect of the college expansion policy with a continuous measure of minimum scores: split the sample based on family background

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
			Father upper					Father other		
VARIABLES	College	First ISEI	First upper	ISEI	Upper	College	First ISEI	First upper	ISEI	Upper
low score * after	0.349	-52.540	-1.350	-16.346	-0.464	0.007	25.741	1.142*	27.689	1.236**
	(1.472)	(47.834)	(1.510)	(44.574)	(1.708)	(0.678)	(17.214)	(0.638)	(19.048)	(0.602)
female	0.019	-0.561	-0.054	-1.585	-0.075	-0.014	1.587	-0.005	1.611	-0.006
	(0.066)	(2.320)	(0.075)	(2.185)	(0.070)	(0.029)	(1.037)	(0.027)	(0.953)	(0.024)
minority	-0.195	-6.476	-0.177	-5.008	-0.149	-0.079	-3.305	-0.064	-3.019	-0.042
	(0.118)	(3.932)	(0.169)	(3.082)	(0.142)	(0.068)	(2.032)	(0.045)	(2.357)	(0.059)
father birth year	0.005	0.358	0.009	0.220	0.007	0.002	0.060	0.002	-0.045	-0.002
	(0.004)	(0.249)	(0.007)	(0.164)	(0.005)	(0.002)	(0.086)	(0.002)	(0.090)	(0.002)
father party member	0.061	2.005	0.010	2.681	0.036	0.150***	2.833**	0.043	2.307**	0.028
	(0.059)	(2.535)	(0.069)	(2.264)	(0.068)	(0.032)	(1.098)	(0.027)	(1.043)	(0.029)
constant	-8.621	-651.139	-16.501	-378.954	-14.226	-3.294	-73.277	-3.191	132.510	3.963
	(8.647)	(484.994)	(14.061)	(316.240)	(9.843)	(4.844)	(168.463)	(4.200)	(175.585)	(4.716)
birth year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
province FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
survey year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
observations	258	238	238	243	243	1,307	1,171	1,171	1,183	1,183
R-squared	0.164	0.134	0.087	0.112	0.085	0.090	0.037	0.022	0.034	0.025
number of province	28	28	28	28	28	30	30	30	30	30

Note: The key variable is the interaction between the dummy on whether one took the college entrance exam after the college expansion policy was implemented and a continuous measure of minimum exam scores for college entrance. I conduct regressions for individuals from upper-class and other families, respectively. The dependent variables include whether an individual has a college degree (column 1) and the individual's occupational status of both first occupation (columns 2 and 3) and current occupation (columns 4 and 5). Individuals born between 1975 and 1982 with at least a senior high school degree are included in the sample. All regressions include birth cohort fixed effects, province fixed effects and survey year fixed effects. Parental characteristics are added as additional determinants, including father's year of birth and father's party membership. Robust standard errors are calculated. *** p<0.01, ** p<0.05, * p<0.1.

Table A6. Further robustness checks

VARIABLES	[1] College	[2] First ISEI	[3] First upper	[4] ISEI	[5] Upper
Panel A: Discritisation of father ISEI					
>70 * low * after	0.227	0.587	-0.012	6.980	0.051
	(0.188)	(8.912)	(0.252)	(8.850)	(0.252)
60-70 * low * after	-0.231	-12.560**	-0.334*	-10.872*	-0.337*
	(0.137)	(5.811)	(0.178)	(5.374)	(0.179)
50-60 * low * after	-0.378**	-3.189	0.052	-1.619	0.046
	(0.146)	(3.811)	(0.096)	(4.632)	(0.122)
40-50 * low * after	0.029	-5.764	-0.045	-7.871	-0.120
	(0.191)	(8.390)	(0.230)	(8.134)	(0.229)
30-40 * low * after	-0.070	-0.977	-0.035	0.296	-0.030
	(0.118)	(4.316)	(0.119)	(4.709)	(0.124)
Panel B: Policy					
policy * after * low	0.227	7.941	0.021	-6.177	-0.158
	(0.143)	(7.803)	(0.102)	(9.799)	(0.204)
policy * low	0.163***	2.885	0.117**	3.232	0.089
	(0.048)	(2.290)	(0.057)	(2.038)	(0.053)
policy * after	0.029	3.961	0.118	7.510	0.188**
	(0.101)	(5.025)	(0.084)	(4.881)	(0.085)
low * after	-0.277*	-6.648	0.044	7.711	0.229
	(0.142)	(8.020)	(0.098)	(10.205)	(0.208)
policy dummy	0.112***	2.229*	0.010	1.001	0.004
	(0.038)	(1.290)	(0.027)	(1.414)	(0.036)
control variables	YES	YES	YES	YES	YES
birth year FE	YES	YES	YES	YES	YES
province FE	YES	YES	YES	YES	YES
survey year FE	YES	YES	YES	YES	YES
number of province	30	30	30	30	30

Note: In panel A, dependent variables include college degree, first and current occupations. Fathers' occupational statuses are measured by dummies on fathers' social classes based on a detailed classification which classifies occupational status into 6 groups. Variables that are in the regression but do not show here also include: the interaction between each category and the dummy on the expansion policy, and the interaction between each category and the dummy on "low score" province and the interaction between the "low score" province and the dummy on the expansion policy. In panel B, "Policy" refers to the abolishment of urban job allocation system in 1996. All the models include birth year fixed effects, province fixed effects, survey year fixed effects, father's year of birth and father's party membership. Robust standard errors are calculated. *** p<0.01, ** p<0.05, * p<0.1.

Table A7. Quality of education among different social classes

VARIABLES	[1] key high school	[2] key university	[3] key high school	[4] key university
upper * low * after			0.454	0.425
			(0.294)	(0.293)
upper * low			-0.098	-0.121
			(0.208)	(0.150)
upper * after			-0.246	-0.143
			(0.276)	(0.231)
low * after	0.127	0.038	0.125	0.031
	(0.079)	(0.058)	(0.099)	(0.107)
upper			0.121	0.104
			(0.155)	(0.112)
female	0.000	-0.020	0.011	-0.013
	(0.040)	(0.030)	(0.054)	(0.042)
minority	-0.007	-0.058	-0.001	-0.050
	(0.073)	(0.065)	(0.111)	(0.076)
father birth year	0.003	0.002	0.000	0.002
	(0.003)	(0.002)	(0.004)	(0.003)
father party member	0.145***	0.117**	0.224***	0.128**
	(0.048)	(0.045)	(0.045)	(0.058)
Constant	-4.952	-3.226	-0.840	-3.380
	(5.650)	(4.478)	(6.983)	(5.645)
birth year FE	YES	YES	YES	YES
province FE	YES	YES	YES	YES
survey year FE	YES	YES	YES	YES
Observations	580	580	322	322
R-squared	0.060	0.080	0.119	0.143
Number of province	29	29	29	29

Note: The CGSS 2003 and 2008 survey asks questions about quality of education including key high school and key college. This table presents the results of linear probability regressions of attending a key high school and a key college. Robust standard errors are calculated. *** p<0.01, ** p<0.05, * p<0.1.

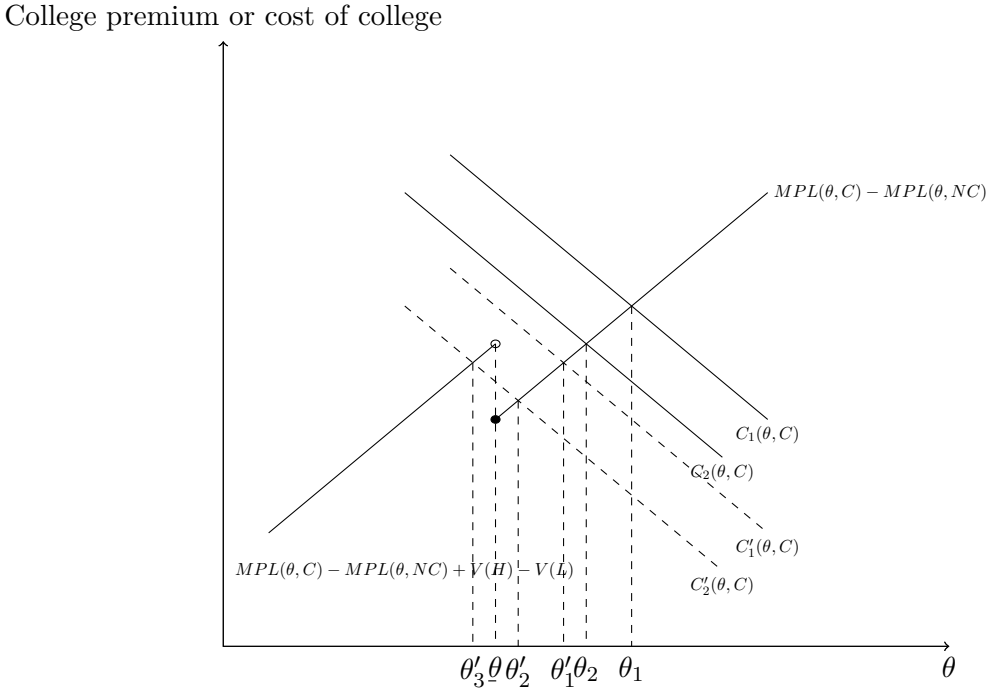


Figure 1.1. College expansion, college admission and college premium: scenario 1

College premium or cost of college

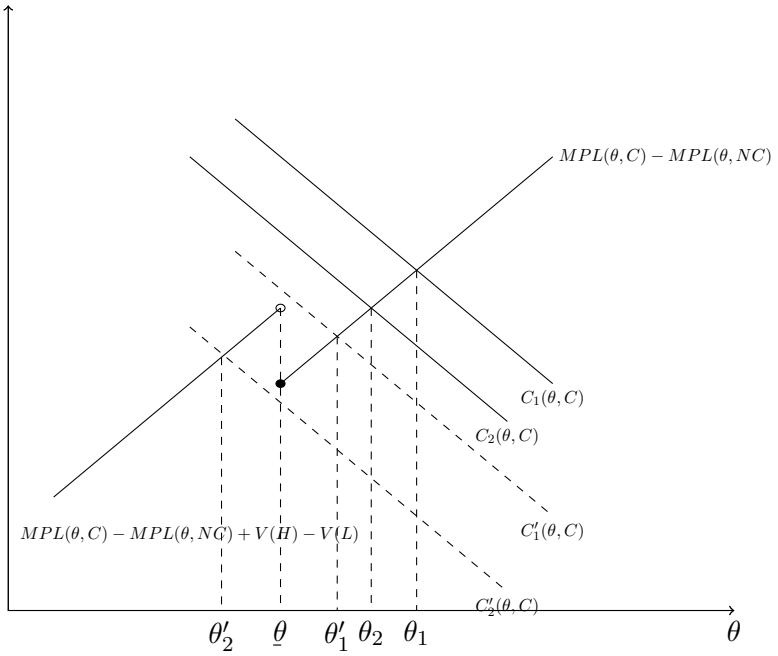


Figure 1.2. College expansion, college admission and college premium: scenario 2

College premium or cost of college

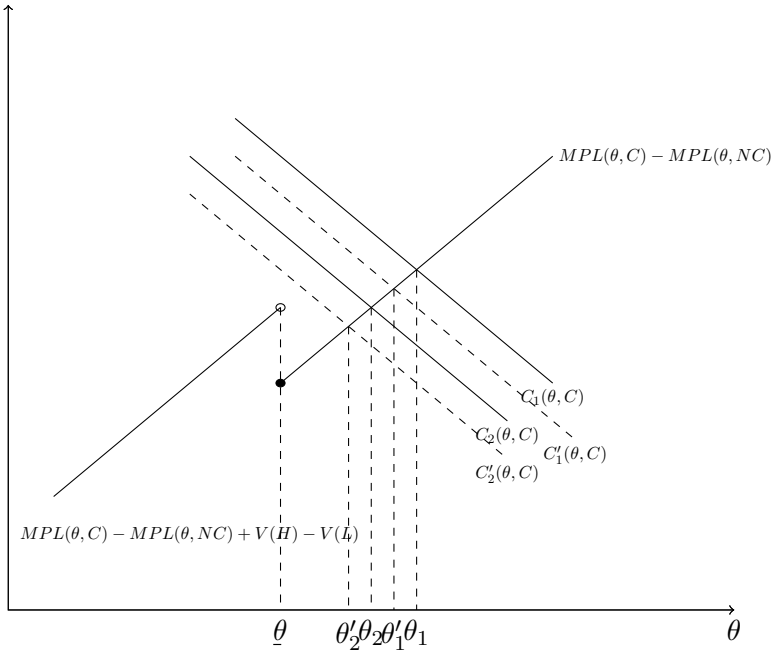
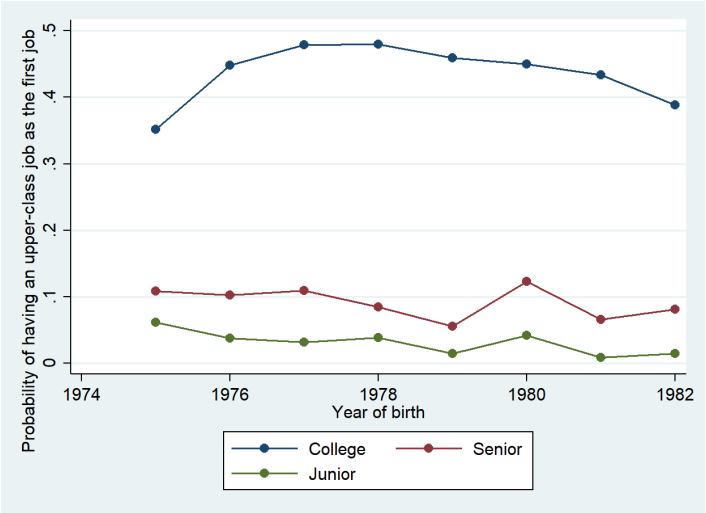
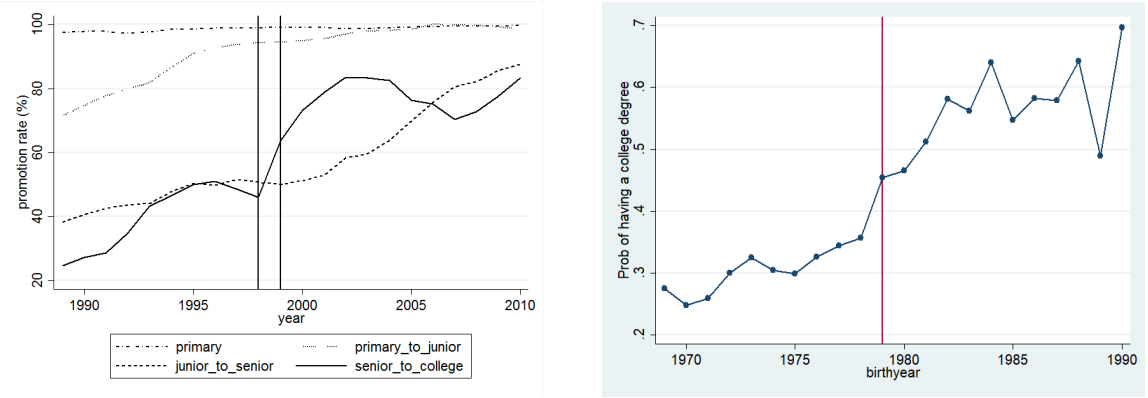


Figure 1.3. College expansion, college admission and college premium: scenario 3



Notes: The figure plots the probability of obtaining an upper class job for each birth cohort. Children with college degree, senior high school degree and junior high school degree are dealt with separately. Data source: CGSS 2003, 2005, 2006, 2008, 2010, 2011, 2012, 2013, 2015.

Figure 2. Probability of obtaining an upper-class job by educational attainments

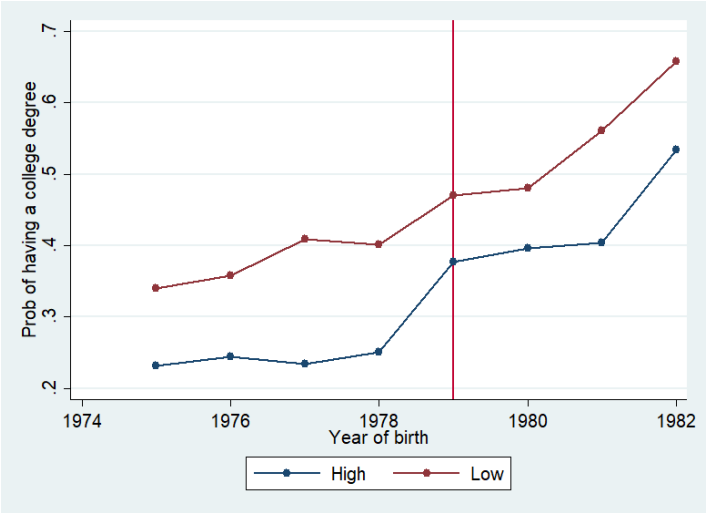


(a) Promotion rates in contemporary China using national statistics

(b) Probability of obtaining a college degree for each birth cohort using CGSS sample

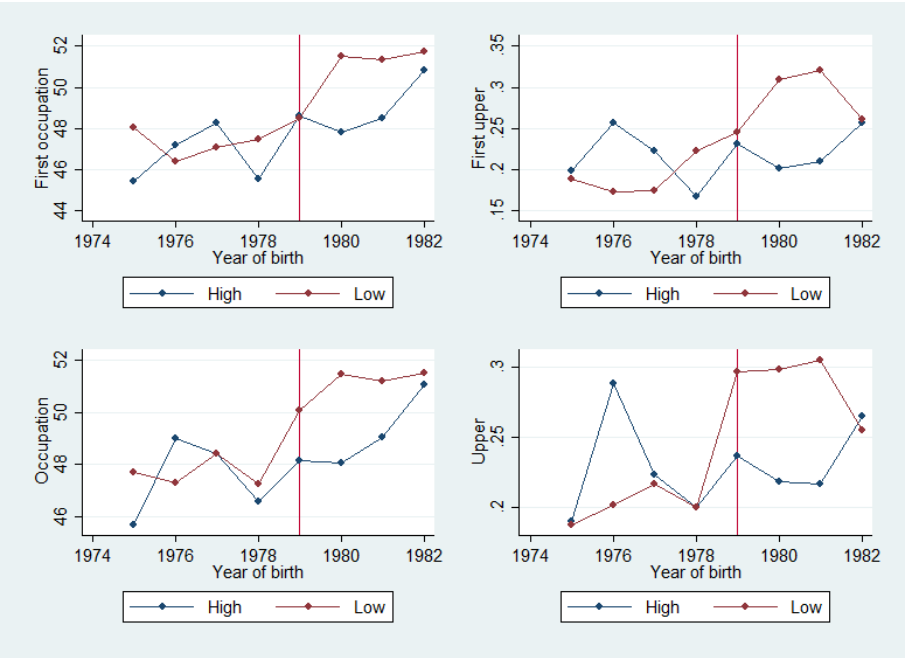
Notes: The left panel plots the promotion rate to primary schools, the promotion rate from primary schools to junior high schools, and the promotion rate from junior high schools to senior high schools. This is the national sample from China Statistic Yearbook 1989-2010. The right panel captures the probability of getting a college degree for each birth cohort. Only individuals having a senior high school or college (and above) degree are included in the sample. Data source: CGSS 2003, 2005, 2006, 2008, 2010, 2011, 2012, 2013, 2015.

Figure 3. Promotion rates using the national statistics and the CGSS sample



Notes: The picture captures the probability of getting a college degree for each birth cohort in provinces with low and high minimum exam scores for college entrance. Only individuals having a senior high school or college (and above) degree are included in the sample. Data source: CGSS 2003, 2005, 2006, 2008, 2010, 2011, 2012, 2013, 2015.

Figure 4. Probability of obtaining a college degree in provinces with low and high minimum exam scores



Notes: The picture captures the average occupational status for each birth cohort in provinces with low and high minimum exam scores. The four graphs report the ISEI score for the first job, the probability of getting an upper class occupation for the first job, the ISEI score for the current job and the probability of getting an upper class occupation for the current job. Only individuals having a senior high school or college (and above) degree are included in the sample. Data source: CGSS 2003, 2005, 2006, 2008, 2010, 2011, 2012, 2013, 2015.

Figure 5. Occupational status in provinces with low and high minimum exam scores

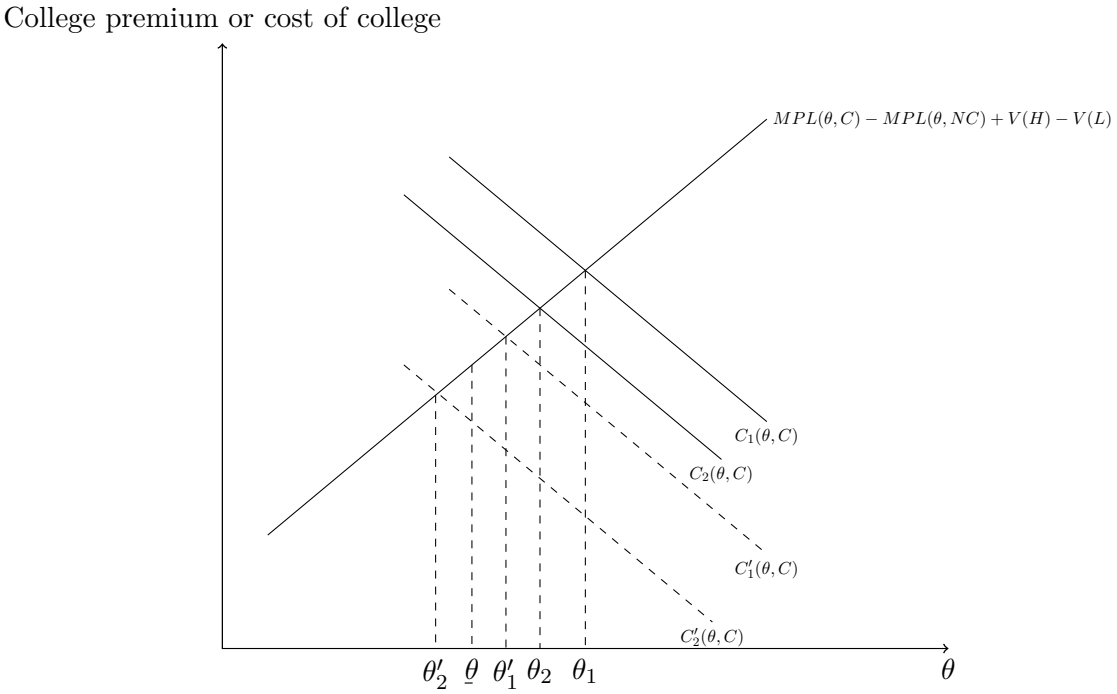
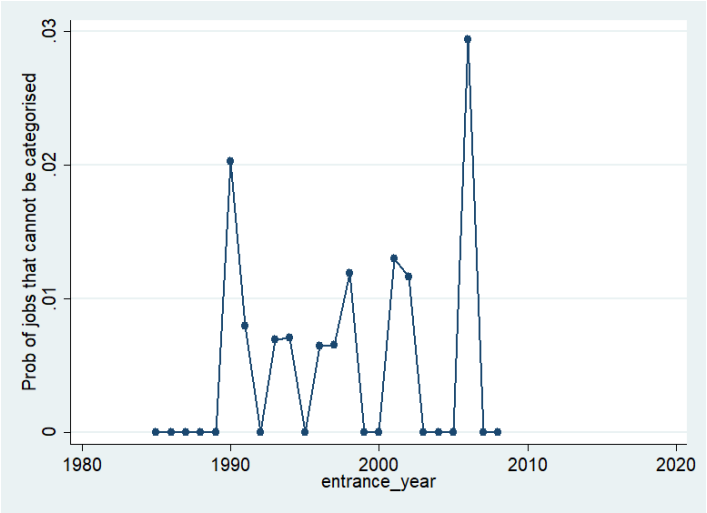
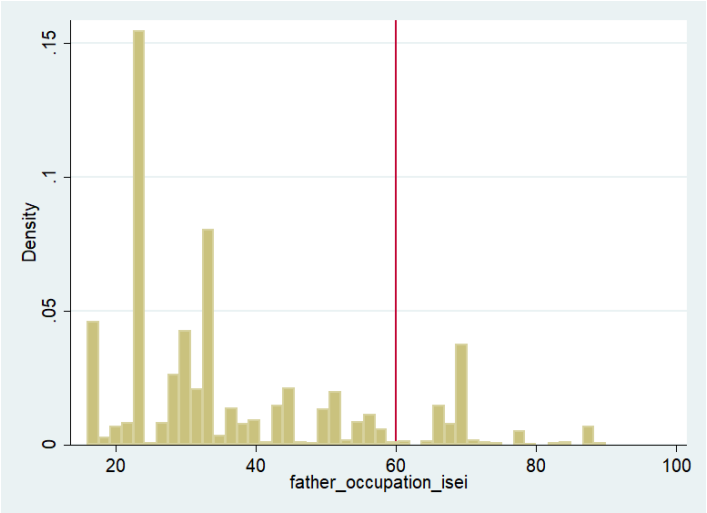


Figure A0. College expansion, college admission and college premium: without nepotism



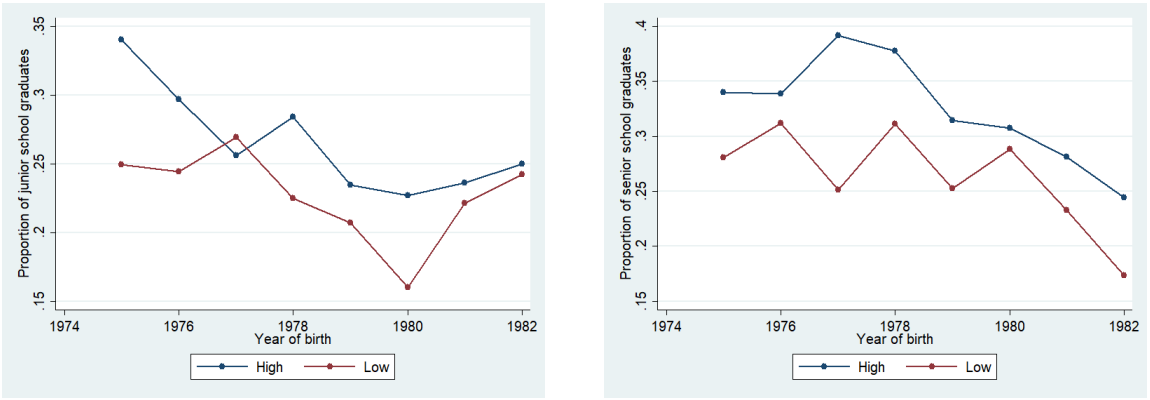
Notes: The picture captures the proportion of jobs which are defined as "hard to classify" for individuals entering the job market each year. A possible increase in the proportion over time may indicate an increase in the number of new jobs in an emerging economy like China. Data source: CGSS 2003, 2005, 2006, 2008, 2010, 2011, 2012, 2013, 2015.

Figure A1. Incidence rate of occupations being categorised as "hard to classify"



Notes: The picture captures the distribution of ISEI scores for fathers' occupations. The vertical axis is the density of each value along the ISEI scale. Data source: CGSS 2003, 2005, 2006, 2008, 2010, 2011, 2012, 2013, 2015.

Figure A2. Distribution of ISEI scores across the whole sample



(a) senior **(b)** high

Notes: The figures capture the composition of individuals having junior and senior high school degrees in each birth cohort. Data source: CGSS 2003, 2005, 2006, 2008, 2010, 2011, 2012, 2013, 2015.

Figure A3. Proportion of people having junior and senior high school degrees in each birth cohort