

The Value of Elite Education in China

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Elite Education and Elite Formation

Access to elite education is believed to be important for elite formation and elite reproduction (social mobility) in modern societies.

- Pierre Bourdieu's works and a sociological literature.
- often based on case studies

In economics, a burgeoning literature on the returns to elite education

- mixed findings in the U.S. context (and other countries)
 - ▶ US: Dale and Krueger (2002, 2011), Black and Smith (2004), Hoekstra (2009)...; Other countries: Anelli (2016), Zimmerman (2016)
- partly due to the typical challenge of selection and data availability
- little discussion on social mobility
 - ▶ Chetty et al. (2017)

This paper

- China's elite education and its implications on social mobility

Why China?

The largest exam country, an ideal laboratory to understand elite education.

- Each year, around **10 million** students take the National College Entrance Exam (*Gaokao*) to get into around 2,300 universities of different tiers.
- The exam score determines whether a young person will attend a university and which one.
 - ▶ in recent years, 75% of the exam-takers are accepted by some university; 5% by an elite university.
- There are cutoff scores for different tiers of universities.

The exam system is one of the most important institutions in China.

- often perceived to provide a ticket to the elite class for commoners.
- affects hundreds of millions of Chinese families.

the obsessive pursuit of university prestige: students, families, schools



Many important consequences, e.g,

- students are too busy to ask questions...

The importance of succeeding in the exam is not without controversy.

- Family background is believed to be crucial in the labor market.
- **“To Each According to His Dad”**
- The upward mobility provided by the exam might be an illusion.

With self-collected data, we attempt to

- estimate the returns to elite education: both income and other pecuniary and non-pecuniary benefits
- understand whether elite education affects social mobility
- shed some light on potential mechanisms

Preview of Main Findings

- ① Does scoring above the elite university cutoff ↑ prob. of going to an elite university?
 - ▶ Yes, the effect is large.
- ② Does elite education lead to higher wages?
 - ▶ Yes, the effect is sizable.
 - ▶ Our focus is the first job. (will show first jobs are important.)
- ③ Does scoring above the cutoff increase/decrease parent-child link in income (and status)?
 - ▶ Neither. We find a neutral effect: elite education and family background play additive roles in mobility.
- ④ What leads to the wage premium, human capital, networks, signaling?
 - ▶ suggestive: no supporting evidence for human capital; more consistent with signaling and university-related networks.

Our contribution

We are not the first to use RD to estimate the return to elite education; but no other studies use national exams.

- Hoekstra (2009): one elite state university in the US; Anelli (2016): one elite college in Italy; Zimmerman (2016): two elite colleges in Chile.

Our disadvantages: not administrative data

- need to be more careful about measurement and selection issues
- focus on the first job + supplementary data on job histories

Our advantages: we design questions to cover all information we need

- income, as well as all other dimensions of social and economic status
- to study implications on social mobility
 - ▶ our hope: bring new perspectives to the literature on elite education
- to shed light on mechanisms: human capital/networks/signaling

Few studies on the consequences of the exam system in China.

Background

All Chinese universities recruit via the national exam system.

- Elite universities (the first-tier) recruit first.

Elite universities: designated as the first-tier across all provinces

- 96 out of 2,300 belong to the tier.
- heavily overlaps with the Project 211 (Top 100 universities for the 21st century)
- 75% of the exam takers are accepted by some college; 5% by an elite one.

Exam score is the admission criterion.

▶ The Process

- Those above the first-tier cutoff are **eligible** to apply.
- **The final admission decision** is determined by competition.

The Admission Process

For **most** provinces:

- ① Students take the exams, which are graded by home provinces.
- ② Based on the distribution of the scores, each province announces a cutoff score of elite universities for each track (social vs. natural science).
 - ▶ the cutoff is set at the level of **105-120% of the provincial quota**.
- ③ Knowing the cutoffs and their scores, students fill applications (universities & majors).
 - ▶ Those above cutoff are **eligible to apply**.
 - ▶ The **final admission decision** is determined by competition.
 - ▶ There is a tradeoff between university and major.
- ④ The universities recruit based on scores of the applicants.

Two variants:

- Beijing and Shanghai: apply before the exam
- A few provinces: apply after the exam *before* knowing the score.

In all cases, the cutoff is **unknown ex ante**.

Background: features that matter for our design

Scores are only comparable within province-year-track.

- 27 out of 31 provinces use a scale of 0-750 points for 3+3 subjects.
- natural science: Chinese (150), Math (150), English (150) + (Physics 110, Chemistry 100, Biology 90)
- social science: Chinese (150), Math (150), English (150) + (Political Science, History, Geography 100 each)

A fuzzy design:

- a small group below the cutoff can get into elite colleges, with extra scores from other things (ethnic minority, being a child of a military martyr, talents in sports, music and math).
- some above the cutoff may go to non-elite colleges due to **competition** or **personal preference**. Those above the cutoff:
 - ▶ are less likely to be in more popular majors (Econ-Business-Law).
 - ▶ are more likely to attend universities outside their home province.
 - ▶ are less likely to be the best students in their college class.

Need to be careful: check heterogeneity in many dimensions.

Data

Administrative data are hard to come by.

- we got access to admin. data for 20M exam-takers...

We collect data by surveying the graduating college students in May and June during 2010-15.

- their exam scores and detailed individual and family characteristics
- the first-job outcomes (wages and other job-related variables)

Implementation of the Survey ▶ More

- implemented by the China Data Center of Tsinghua (directed by Hongbin)
- 90 out of 100 selected universities (stratified by regions) collaborated (varying by year).
- deliberately oversampled elite universities (26 out of 90 are elite univ.)

Response rates: 71.5% (elite) and 76.9% (others); p -value: 0.26.

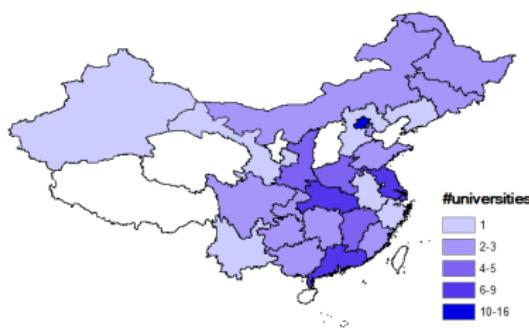
Data

Selection & Misreporting

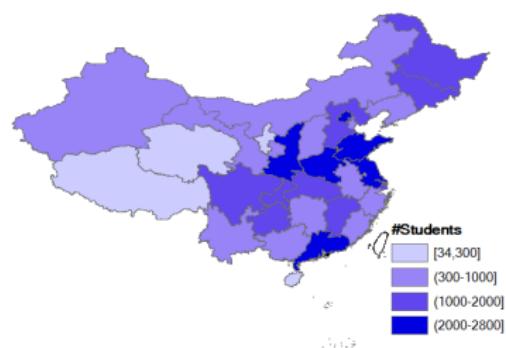
▶ More Discussion

34,733 out of 40,916 students reported their score and province of exam.

- 10,335 are within the bandwidth of 20-points (optimal bw by Imbens-Kalyanaraman: 21)
- roughly 3 points per subject



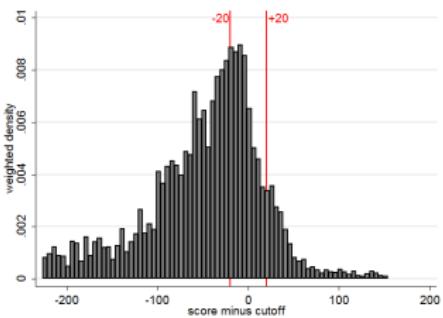
Distribution of the 90 Universities



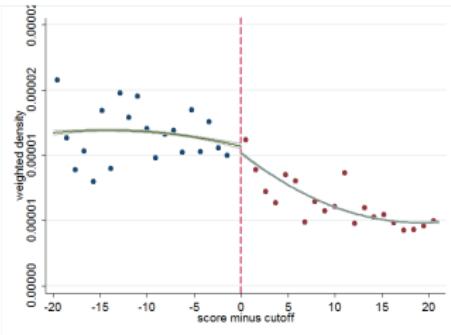
#Students by Province of Exam

▶ universities

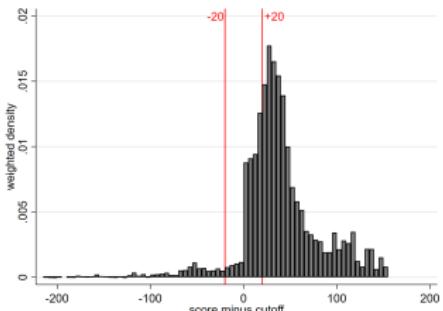
Distribution of Scores (wt by sampling weight)



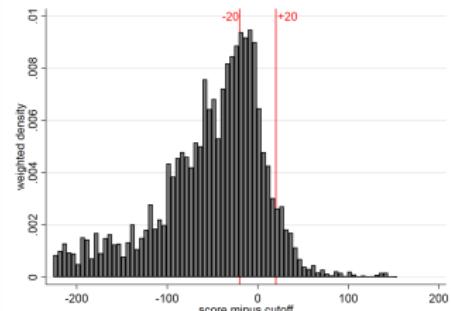
The whole sample



within the 20-point bandwidth

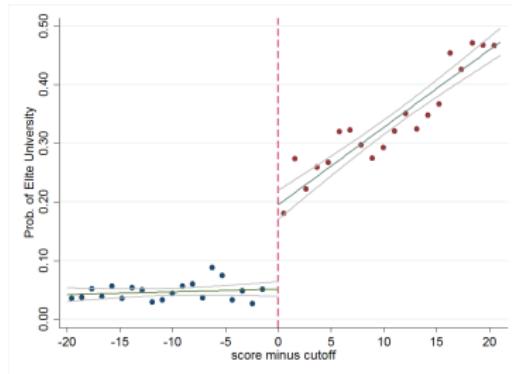


Elite universities

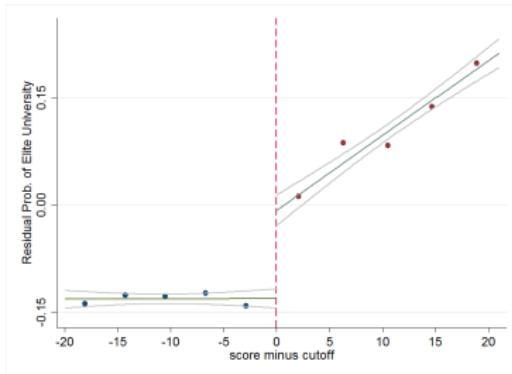


Non-elite universities

Exam Scores and Access to Elite Education



Raw Data



with Prov-Year-Track FE (4-pt bin)

- scoring above cutoff \uparrow prob. of elite education by 0.15
- about 70% of the mean (0.21)

results with placebo cutoffs ▶ more

Exam Scores and Access to Elite Education

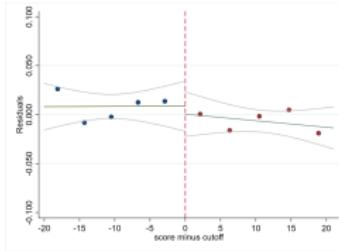
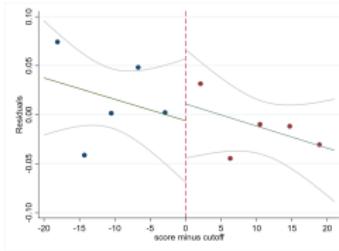
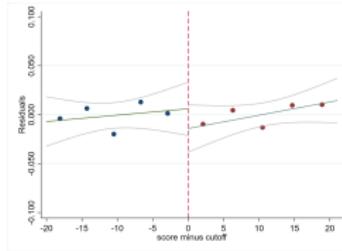
$$\text{EliteUniv}_{i,p,y,tr} = \alpha_E I(\text{Score}_i \geq \text{Cut}_{p,y,tr}) + \theta_1 f(\text{Score}_i - \text{Cut}_{p,y,tr}) + \theta_2 f(\text{Score}_i - \text{Cut}_{p,y,tr}) \times I + \lambda_{p,y,tr} + \varepsilon_{i,p,y,tr},$$

Method	(1)	(2)	(3)	(4)	(5)
	Local Linear		Parametric		
Above Cutoff	0.165*** (0.013)	0.294*** (0.074)	0.283*** (0.061)	0.155*** (0.048)	0.159*** (0.040)
Province-Year-Track FE			Y	Y	Y
Linear Interaction				Y	Y
Quadratic Interaction					Y
Observations	10,335	10,335	10,335	10,335	10,335
R-squared		0.129	0.326	0.344	0.344

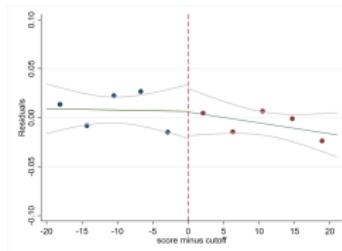
Little heterogeneous response conditional on scoring above cutoff.

▶ More

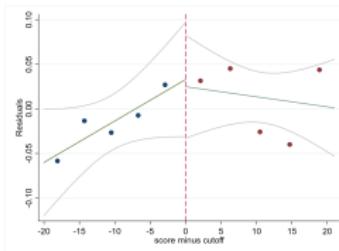
Balance Tests



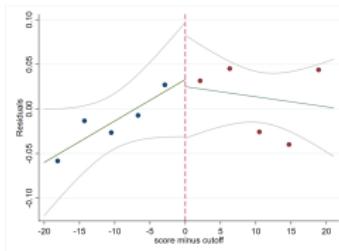
Male



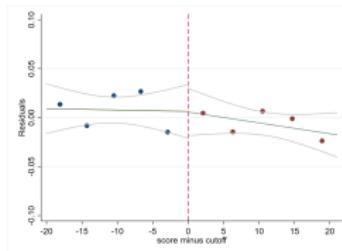
Age



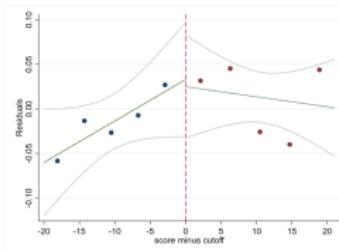
Repeated



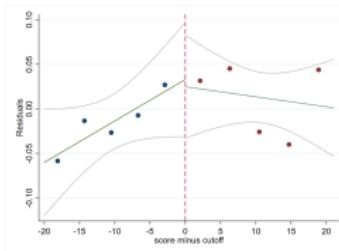
Rural



In Father Income

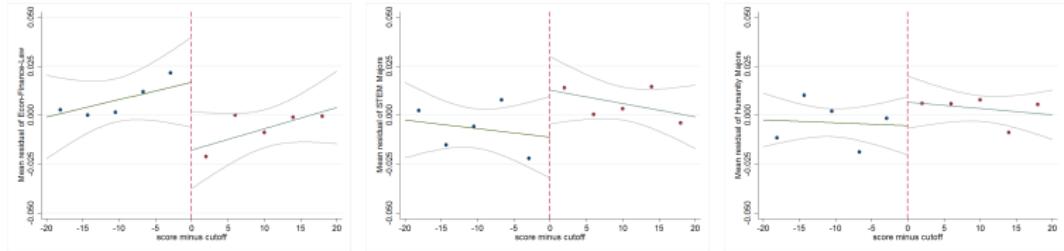


In Mother Income



Also balanced in parent with college degree/being a party member.

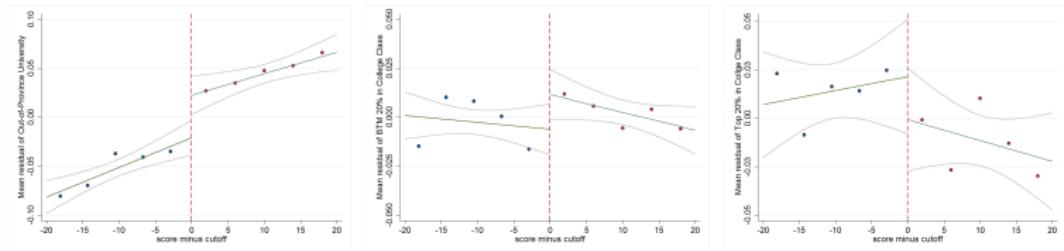
Other features: major, univ. location, relative ranking in college



Econ-Mang.-Law

STEM

Humanity



Out of Prov. Univ.

In college: btm 20%

Top 20%

Above the cutoff

- weakly ↓ majoring in econ-manage.-law (insignificant); ↑ studying out of prov.
- ↑ self-reporting to be btm 20%, ↓ top 20%

The Sample With Wage Observed

74% searched for jobs; 74% got offers after search:

- 5,080 with wages within the bandwidth (10,335 for the first stage)

For those with offers, monthly wage: median 2,500 RMB, mean 2,733.

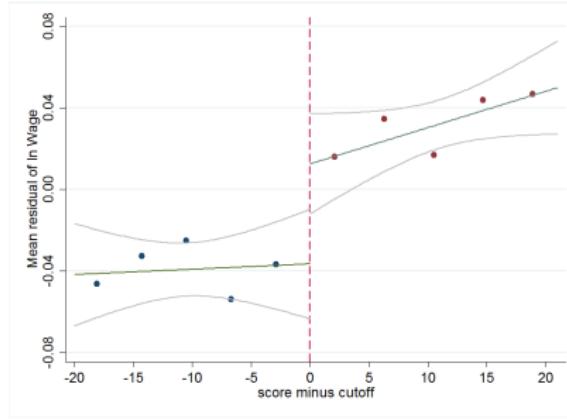
Selection (having job offers) is not a critical issue

- ① The sample with observed wages is still balanced. ▶ Results
- ② Those above the cutoff are only slightly less likely to search for jobs.

▶ Results

- ▶ Bounding exercises demonstrate that the concern is not quantitatively important (Lee 2009).

Elite Education Wage Premium



Isolating Province-Year-Track FE

scoring above cutoff \uparrow In Wage by 0.06, 160 RMB (USD 26) per month

- the wage premium of elite education: $0.06/0.15 = 40\%$ (1,000 RMB)

► Estimation Results

Wage Premium: Major, Location and Class Ranking

	(1)	(2)	(3)	(4)	(5)	(6)
Major FEs (13)		Y			Y	
Univ. Province FEs (26)			Y		Y	
College Class Rank FEs (5)				Y	Y	
University FEs (82)						Y
Above Cutoff	0.067** (0.027)	0.070** (0.027)	0.059** (0.027)	0.082*** (0.026)	0.075*** (0.027)	0.029 (0.026)
Province-Year-Track FE	Y	Y	Y	Y	Y	Y
Linear Interaction	Y	Y	Y	Y	Y	Y
Quadratic Interaction	Y	Y	Y	Y	Y	Y
Observations	5,078	5,075	5,080	4,994	4,991	5,080
R-squared	0.273	0.290	0.290	0.275	0.309	0.320

- Including major and ranking increase the effect slightly.
- Including university fixed effects absorbs the effect.

Wage Premium: Additional Checks

- Robust to using different bandwidth [▶ More](#)
- Similar quartile treatment effects [▶ More](#)
- Bounds using Lee (2009) method: [0.053, 0.086] vs. 0.067 (baseline)
[▶ More](#)
- The premium cannot be explained by cost of living. [▶ More](#)

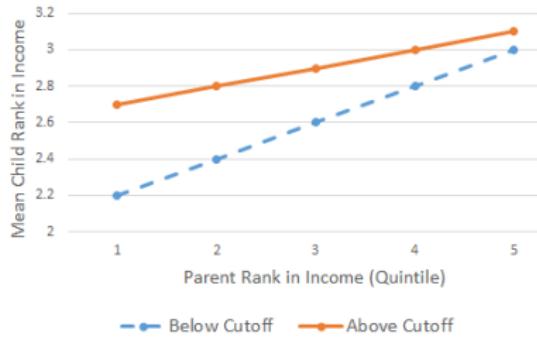
Summary and next

- ① There is a large elite college wage premium.
- ② What does it imply for intergenerational income mobility?
 - ▶ All second generation are college graduates.
 - ▶ Child outcomes are based on the first jobs.

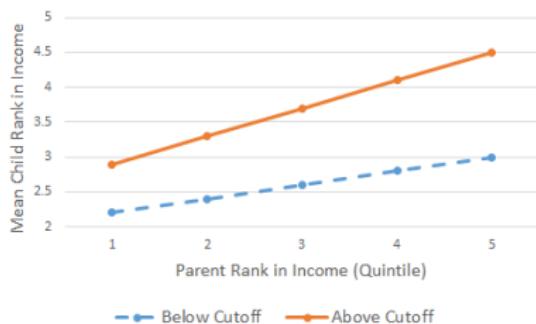
In addition, we examine

- ③ results beyond wages: occupation, industry & ownership
- ④ the importance of the first job
- ⑤ mechanisms for the wage premium?

2. Social Mobility: Two Theoretical Scenarios



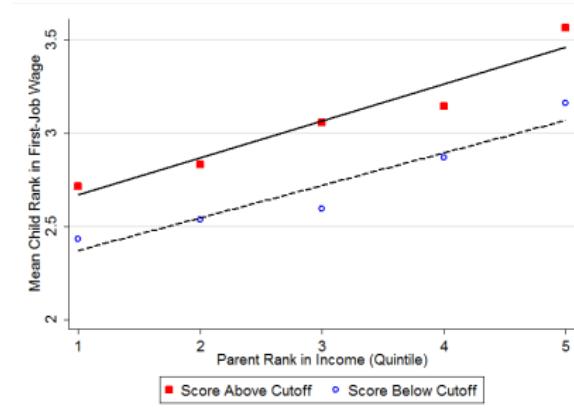
above the cutoff ↑ intergenerational mobility



↓ intergenerational mobility

- ① Difference in intercepts > 0 : elite education \uparrow child income rank of the bottom parental income group
- ② Larger slope means lower (relative) intergenerational mobility

2. Social Mobility: Descriptive Results of Wage Rank



Child Wage Rank Against Parental Income Rank

Scoring above the cutoff \uparrow income rank (absolute mobility).

- The effect is large, ≈ 2 quintiles increase in parental income.

It does not change the parent-child link (relative mobility).

- It is an illusion to think that succeeding in the exam attenuates the intergenerational link. Think about the children from the top 20% families.
- Still more optimistic than the scenario (b).

2. Social Mobility: Empirical Results on Wages

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Child Rank (1-5)				InWage			
Above Cutoff * Parent Rank			0.024	0.005				
			(0.035)	(0.023)				
Rank of Parent Income	0.184***	0.187***	0.174***	0.087***				
	(0.025)	(0.024)	(0.026)	(0.019)				
Above Cutoff * Ln Parental Income					0.001	-0.002		
					(0.012)	(0.009)		
Ln Parental Income					0.072***	0.074***	0.073***	0.038***
					(0.010)	(0.009)	(0.009)	(0.008)
Above Cutoff	0.339***	0.275**	0.303***		0.100***	0.100***	0.085***	
	(0.076)	(0.123)	(0.113)		(0.024)	(0.024)	(0.028)	
Prov-Year-Track FE				Y				Y
Linear Interaction				Y				Y
Quadratic Interaction				Y				Y
Observations	4,696	4,696	4,696	4,696	4,696	4,696	4,696	4,696
R-squared	0.043	0.062	0.062	0.268	0.043	0.061	0.061	0.285

- the impact of scoring above the cutoff $\approx 1.5\text{-}2$ folds increase in parental income.
- the top 20% parental income is more than 10 folds the bottom 20%.
- Chetty et al. (2014): rank-rank correlation, 0.2-0.3.

Also neutral in other characteristics (gender, rural etc.)

3. On occupation, industry and ownership

We also gathered info. on occupations (12), industries (18) and ownership (3).

Useful in two aspects:

- unpack the variation in the wage premium
- may capture some job characteristics not measured by wage per se, e.g., SOEs

We also try to measure their desirability, e.g., an occupation i is,

- more desirable if many want to work in i but very few make it.

In our data, more desirable 

- occupations: managers/business owners
- industries: financial industry/culture/governments
- ownership: state/foreign

3. Findings on occupation, industry and ownership

- ① The wage premium cannot be explained by occupations, industries or ownership. It comes from variation within these cells.
- ② Elite education does not promise more desirable occ/ind/ownership.

Dependent Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	In Wage					Occupation	Industry	More Disable Dsr. Ownership
Mean Dep. Var.						0.06	0.17	0.54
Occupation FEs (12)		Y			Y			
Industry FEs (18)			Y		Y			
Ownership FEs (3)				Y	Y			
Above Cutoff	0.067** (0.027)	0.077*** (0.028)	0.071*** (0.026)	0.071** (0.027)	0.079*** (0.028)	0.004 (0.025)	-0.026 (0.024)	0.005 (0.044)
Prov-Year-Track FE	Y	Y	Y	Y	Y	Y	Y	Y
Linear Interaction	Y	Y	Y	Y	Y	Y	Y	Y
Quadratic Interaction	Y	Y	Y	Y	Y	Y	Y	Y
Observations	5,080	4,946	5,025	5,039	4,888	4,946	5,025	5,039
R-squared	0.273	0.283	0.301	0.279	0.315	0.111	0.203	0.118

- ③ There is a strong parent-child link these characteristics that is not varied by elite education – the same as the wage finding. Table

4. The importance of the first job

Our design can only study the first job. How important is the first for the future?

- A different dataset: CVs of 304,021 individuals looking for jobs on zhaopin.com.
- Monthly income in bins (1: 0-1K, 2: 1-2K, 3: 2-4K, 4: 4-6K, 5: 6K+)
- Our focus: those with four-year college education

How do first job wages correlate with future wages?

$$Wage_{i,u,t} = \alpha_1 Wage_{i,u,1} + \alpha_2 Wage_{i,u,1} \times EliteUni_u + \lambda_u + \gamma \mathbf{X}_{i,t} + \gamma' \mathbf{X}_{i,t} \times EliteUni_u + \varepsilon_{i,u,t},$$

standardized coefficients:

Year after graduation	1-5			6-10		
	(1)	(2)	(3)	(4)	(5)	(6)
First-job Wage Rank(std)	0.731*** (0.002)	0.695*** (0.003)	0.682*** (0.003)	0.681*** (0.006)	0.673*** (0.007)	0.651*** (0.009)
First-job Wage Ranks (std) * Elite University			0.034*** (0.005)			0.045*** (0.013)
Age, Sex	Y	Y	Y	Y	Y	Y
University FEes	Y	Y	Y	Y	Y	Y
Age*Elite, Sex*Elite			Y			Y
Observations	146,900	146,900	146,900	28,057	28,057	28,057
R-squared	0.623	0.656	0.657	0.434	0.524	0.525

- The first job wage is a strong predictor for the future wages.
- Also strong persistence in terms of occupation, industry and ownership.

5. Potential Mechanisms

Why should elite education affect wages?

- Human capital
- Networking or connections
- Signaling

It is generally difficult to identify any of these. Our rich data can provide some suggestive evidence.

5. Mechanisms: Human Capital

1. College major is a possible proxy and cannot explain the wage premium.
2. An ideal measure: standardized test scores every college student takes.
 - close to ideal: National College English Test (CET 4, max: 710 points).
 - a 20-point increase in CET-4 is associated with a 4% increase in wages.
3. Plus other certificates from national tests (caveat: not everyone takes).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Col. English Test Taking 0/1	CET4 Score	Certificates/Licenses from Exams Taken in College Computer	Field (CPA/BAR)	Vocation.	Driving	Weekly Hours by Activity (Last Year) In Class	Study oneself	Study English	Sport
Mean	0.88	461	0.56	0.15	0.21	0.35	24.7	13.9	6.3	5.7
Above Cutoff	-0.014 (0.034)	-2.453 (2.834)	0.022 (0.041)	-0.090** (0.040)	-0.003 (0.041)	-0.013 (0.039)	-0.571 (1.523)	1.437 (1.239)	-0.953 (0.634)	0.381 (0.594)
Prov-Year-Track FEs	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Linear Interaction	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Quadratic Interaction	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	5,080	4,446	4,542	4,542	4,542	4,542	3,785	3,886	4,705	4,616
R-squared	0.099	0.277	0.193	0.130	0.107	0.139	0.097	0.110	0.131	0.083

No evidence for the human capital story.

5. Mechanisms: Social Networks

Measure: share of schoolmates with parents in the party/with college degree

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	% schoolmates w. parents						
Mean	Party	college					In Wage
Above Cutoff	0.883** (0.410)	0.973** (0.372)	0.067** (0.027)	0.059** (0.026)	0.060** (0.026)	0.056** (0.025)	0.057** (0.025)
% schoolmates w. parents in the party				0.009*** (0.001)	0.009*** (0.001)		
Own parents in the party					0.031** (0.013)		
% schoolmates w. parents w. college						0.011*** (0.001)	0.011*** (0.001)
Own parents with college degree							0.025 (0.022)
Prov-Year-Track FEs	Y	Y	Y	Y	Y	Y	Y
Linear Interaction	Y	Y	Y	Y	Y	Y	Y
Quadratic Interaction	Y	Y	Y	Y	Y	Y	Y
Observations	5,080	5,080	5,080	5,080	5,080	5,080	5,080
R-squared	0.617	0.576	0.283	0.283	0.284	0.287	0.287

- Networks partly explains the wage premium (e.g., from 0.067 to 0.056).
- This is a lower bound of the network effect.

5. Mechanisms: Social Networks/Signaling

Channels of Job Search

	(1)	(2)	(3)	(4)	(5) Personal networks
	Off-campus fairs	Teacher	On-campus fairs	Website	
Mean	0.41	0.57	0.77	0.57	0.26
Above Cutoff	0.022 (0.051)	0.041 (0.045)	0.061** (0.025)	0.032 (0.043)	-0.019 (0.040)
Prov-Year-Track FEs	Y	Y	Y	Y	Y
Linear Interaction	Y	Y	Y	Y	Y
Quadratic Interaction	Y	Y	Y	Y	Y
Observations	5,063	5,063	5,063	5,065	5,063
R-squared	0.096	0.080	0.148	0.117	0.078

Maybe not surprising:

- College reputation or/and alumni networks attract employers.

5. Mechanisms: Signaling

Reported discrimination in the job search.

Discrimination Mean	(1)	(2)	(3) Yes/No Question	(4)	(5)	(6)	(7) Open Question	(8)
	Gender 0.25	Look 0.15	Accent 0.08	Rural 0.08	Hukou 0.26	University 0.36	Major 0.14	Experience 0.06
Above Cutoff	0.018 (0.038)	-0.021 (0.029)	-0.005 (0.028)	0.003 (0.027)	-0.029 (0.034)	-0.279 (0.184)	-0.045 (0.126)	0.054 (0.072)
Prov-Year-Track FEs	Y	Y	Y	Y	Y	Y	Y	Y
Linear Interaction	Y	Y	Y	Y	Y	Y	Y	Y
Quadratic Interaction	Y	Y	Y	Y	Y	Y	Y	Y
Observations	4,593	4,410	4,260	4,250	4,519	388	388	388
R-squared	0.109	0.111	0.096	0.089	0.129	0.481	0.399	0.554

Together with the job search results, we find suggestive evidence for signaling.

Consistency with the Institutional Background

We find that university-related reputation/networks is important.

- consistent with the “strict entrance, easy out” system.

Our results suggest elite university and family background play additive roles in determining one's status.

- partly explains why some emphasize the importance of the exam system while others focus on family background.

Summary

Key findings

- ① Scoring above the cutoff ↑ prob. of elite education.
- ② Elite education has sizable returns in terms of wage.
- ③ Scoring above the cutoff ↑ income rank (absolute mobility) but does not change the parent-child link (relative mobility).
 - ▶ It is an illusion to think that succeeding in the exam attenuates the intergenerational link.
 - ▶ Too pessimistic to think that the intergenerational link only gets strengthened by elite education.
- ④ The findings are more consistent with signaling and university networks than human capital.

We hope to contribute to

- a literature on elite education
- a literature on intergenerational mobility
- understanding the exam system

Implementation of the Survey I

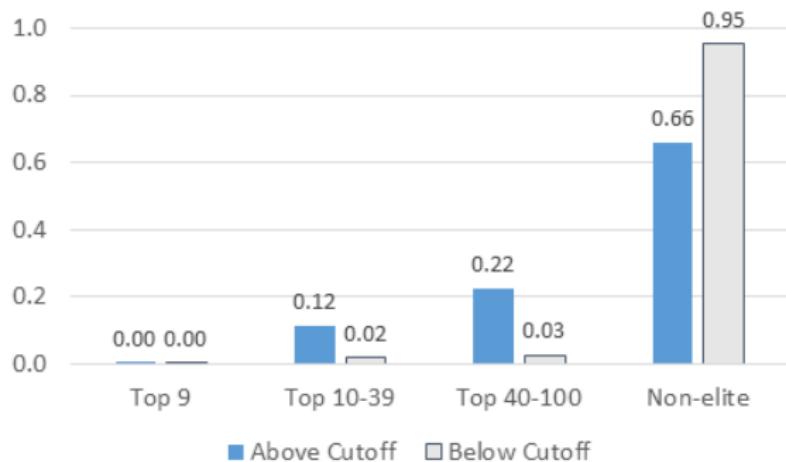


Training

Each college, we trained a clerk in the student registration office + two/three administrators.

- the clerk helped us select a sample of students from the roster of the graduating cohort.
- the administrators gathered students in big classrooms to fill the surveys.
- the filled forms are mailed to the Beijing office for data entry.

University composition (20-point bandwidth)



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Implementation of the Survey II

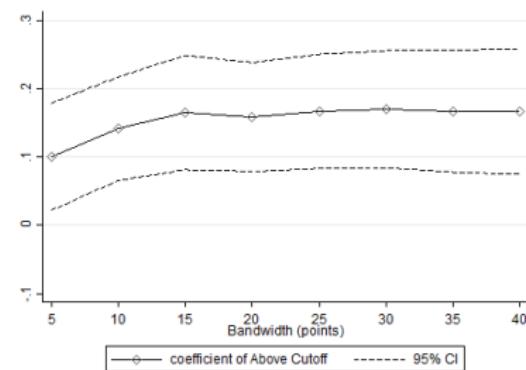
	#Universities	#Students Per University	Total #Students
2010	19	319	6,060
2011	50	164	8,176
2012	50	173	8,650
2013	65	164	10,679
2014	17	212	3,607
2015	13	288	3,744
Total	90		40,916

We targeted 400 students per college in 2010 (pilot) and 200 in 2011-13.

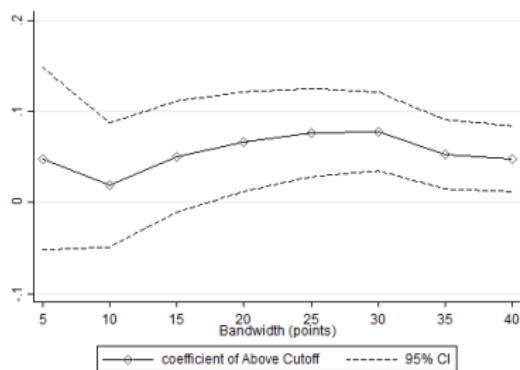
- 2014-15: only those who are willing and can afford the survey did it with an aim of 400 students.

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Results by bandwidth



(a) Scores and Elite Education

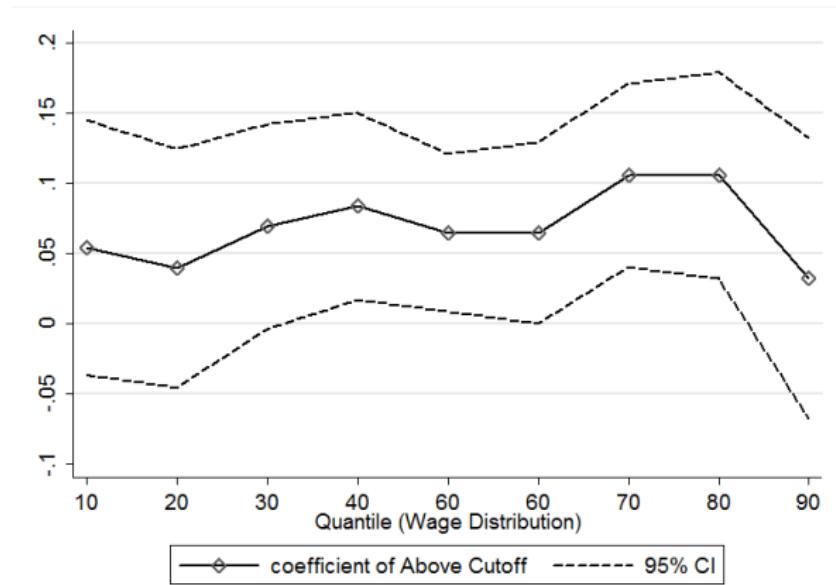


(b) Scores and Wage Premium

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Quartile Treatment Effects

The Impacts of Elite Education Eligibility on Wage across Wage Distribution



Bounded estimates

Dependent Var.	(1)	(2)	(3)
	Residual log wage (isolating province-year-track FEs)		
	OLS	Lower bound	Upper bound
Above Cutoff	0.067*** (0.009)	0.053*** (0.024)	0.086*** (0.025)
Observations	5,080	10,335	10,335

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Cost of Living

Dependent Var.	(1)	(2)	(3)	(4)	(5)	(6)
	Ln Real Wage			Ln Wage		
Above Cutoff	0.076*** (0.015)	0.079*** (0.024)	0.084** (0.033)	0.080*** (0.014)	0.075*** (0.021)	0.078*** (0.029)
Job Location FE				Y	Y	Y
Province-Year-Track FE	Y	Y	Y	Y	Y	Y
Linear Interaction		Y	Y		Y	Y
Quadratic Interact.		Y	Y		Y	Y
Observations	4,505	4,505	4,505	4,505	4,505	4,505
R-squared	0.201	0.201	0.201	0.306	0.306	0.306

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Risk Attitudes

Risk attitudes: measured in 2011 only.

- choice between losing (or gaining) 1000 RMB with certainty vs. losing (or gaining) 2000 RMB and 0 with an equal chance
 - risk averse=1 if choosing certainty for both questions.
- "If you invest, it is more important to ensure a (lower) return with certainty than to take some risk for the greatest possible return."
 - risk averse=1 if one agrees/strongly agrees.

Dependent Var.	(1) Elite University	(2) Risk-averse (lottery)	(3) Risk-averse (investment)	(4) Elite University	(5) Elite University
Above Cutoff * Risk-averse (lottery)				0.015 (0.032)	
Above Cutoff * Risk-averse (investment)					-0.017 (0.033)
Above Cutoff	0.182*** (0.063)	-0.062 (0.048)	-0.040 (0.074)	0.174*** (0.061)	0.188*** (0.064)
Risk-averse (lottery)				-0.005 (0.021)	
Risk-averse (investment)					0.011 (0.022)
Province-Year-Track FE	Y	Y	Y	Y	Y
Linear Interaction	Y	Y	Y	Y	Y
Quadratic Interaction	Y	Y	Y	Y	Y
Observations	2,218	2,155	2,167	2,155	2,167
R-squared	0.372	0.030	0.031	0.367	0.368

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Also Neutral in Other Characteristics

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	(1)	(2)	(3)	(4)	(5)	(6)
Above Cutoff	0.064** (0.027)	0.072** (0.029)	0.084*** (0.029)	0.080*** (0.029)	0.066** (0.027)	0.073*** (0.028)
Above Cutoff * Rural	0.004 (0.021)					
Above Cutoff * Repeated		-0.014 (0.015)				
Above Cutoff * Male			-0.026 (0.018)			
Above Cutoff * Age				-0.016 (0.011)		
Above Cutoff * College Parent					0.024 (0.042)	
Above Cutoff * Party Parent						-0.023 (0.020)
Rural Hukou	-0.028* (0.015)					
Repeated Exam Taker		-0.008 (0.014)				
Male			0.080*** (0.012)			
Age				0.008 (0.009)		
Parent w. College Degree					0.029 (0.033)	
Parent being Party Member						0.048*** (0.016)
Province-Year-Track FE	Y	Y	Y	Y	Y	Y
Linear Interaction	Y	Y	Y	Y	Y	Y
Quadratic Interaction	Y	Y	Y	Y	Y	Y
Observations	5,080	5,080	5,080	5,028	5,080	5,080
Prob < Chi^2	0.074	0.073	0.073	0.074	0.074	0.075

Background: College Admission

For **most** provinces:

- ① Students take the exams, which are graded by home provinces.
- ② Based on the distribution of the scores, each province announces a cutoff score of elite universities for each track (social vs. natural science).
 - ▶ the cutoff is set at the level of **105-120% of the provincial quota**.
- ③ Knowing the cutoffs and their scores, students fill applications (universities & majors).
 - ▶ Those above cutoff are **eligible to apply**.
 - ▶ The **final admission decision** is determined by competition.
 - ▶ There is a tradeoff between university and major.
- ④ The universities recruit based on scores of the applicants.

Two variants:

- Beijing and Shanghai: apply before the exam
- A few provinces: apply after the exam *before* knowing the score.

In all cases, the cutoff is **unknown ex ante**.

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Data: Selection and Measurement Issues in Our Survey

We do not need & do not have a random sample of all college students.

- Not every college complied.
- Not every student (randomly selected within a university) complied.

What we need: enough students around the cutoff; they are balanced across the cutoff.

- We oversampled elite universities.

possible misreporting of scores

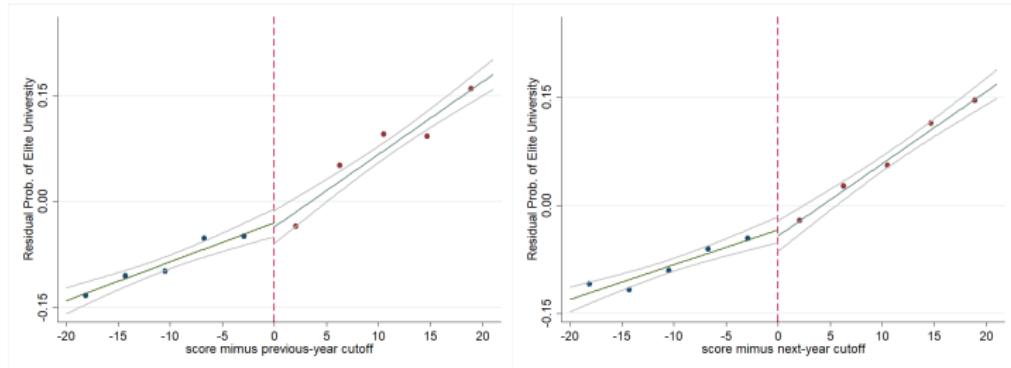
- Unclear why students just misreport around the cutoff. This concern is more important for the tails (not our focus).
- The data can tell: there should be a clear discontinuity around the cutoff.
- We can check the density of scores (wt by sample weight of schools) –see next.

possible misreporting of wages

- To minimize outliers of wages, we trim 5% (2.5% on each tail) of the data.
- also present rank results.

Placebo Cutoffs

No similar discontinuity using previous-year/next-year cutoff



(c) Previous-year cutoffs w. Pr-Y-Tr FEs (d) Next-year cutoffs w. Pr-Ye-T FEs

$Cutoff_{p,y,tr} - Cutoff_{p,y-1,tr}$: mean -4.5; s.d. 30.4.

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Little heterogeneous effect

similar for studying out of province/rank in college; for

[Risk Attitudes](#)

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	(1)	(2)	(3)	(4)	(5)	(6)
	Elite University			Major: econ-manage.-law		
Above Cutoff*Rural	-0.018 (0.033)			0.014 (0.023)		
Above Cut*Female		0.019 (0.024)			0.024 (0.021)	
Above*In H Income			0.009 (0.017)			-0.005 (0.009)
Above Cutoff	0.169*** (0.038)	0.151** (0.053)	0.158*** (0.040)	-0.049 (0.034)	-0.051 (0.031)	-0.031 (0.026)
Rural	-0.019 (0.017)			-0.015 (0.015)		
Female		-0.013 (0.012)			0.035** (0.017)	
In HH Income			0.011 (0.009)			0.026*** (0.006)
Prov-Year-Track FE	Y	Y	Y	Y	Y	Y
Quadratic Interact.	Y	Y	Y	Y	Y	Y
Observations	10,335	10,335	9,383	10,314	10,314	9,363
R-squared	0.345	0.344	0.340	0.240	0.243	0.244

Job Search and Plans

- Those above the cutoff are only slightly less likely to search for jobs.

Method	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)		(11)		(12)	
	Post-Graduate Plan		Work in China		Graduate Study		Abroad		Unclear		Searched for Jobs		Offer after search											
Above Cutoff	-0.028 (0.019)	-0.044* (0.024)	-0.001 (0.017)	0.002 (0.021)	0.004 (0.007)	0.004 (0.008)	0.020** (0.009)	0.031* (0.016)	-0.034* (0.019)	-0.046 (0.034)	-0.035 (0.022)	-0.050 (0.035)	0.74	0.74										
Prov-Year-Track FE	Y		Y		Y		Y		Y		Y		Y		Y		Y		Y		Y		Y	
Linear Interaction	Y		Y		Y		Y		Y		Y		Y		Y		Y		Y		Y		Y	
Quadratic Interact.	Y		Y		Y		Y		Y		Y		Y		Y		Y		Y		Y		Y	
Score FE	Y		Y		Y		Y		Y		Y		Y		Y		Y		Y		Y		Y	
Observations	10,335	10,335	10,335	10,335	10,335	10,335	10,335	10,335	10,179	10,179	7,265	7,265												
R-squared	0.105		0.117		0.076		0.075		0.111		0.111		0.118											

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Balanced Tests for the Wage Sample

- The sample with observed wages is balanced.

	(1) Male	(2) Age	(3) Repeated	(4) Rural	(5) Ln(Father Income)	(6) Ln(Mother Income)	(7) Ln(Family Income)	(8) Parent College Edu	(9) Parent Party Mem.
(a) sample within a 20-point bandwidth, n=10,335									
Above Cutoff	-0.007 (0.029)	0.001 (0.076)	-0.035 (0.033)	0.014 (0.026)	0.031 (0.067)	0.038 (0.083)	0.023 (0.060)	-0.015 (0.020)	-0.004 (0.024)
(b) sample within a 20-point bandwidth & with wage offers, n=5,080									
Above Cutoff	-0.028 (0.042)	-0.112 (0.094)	-0.011 (0.044)	0.000 (0.035)	0.089 (0.084)	0.130 (0.125)	0.070 (0.068)	-0.027 (0.020)	-0.036 (0.035)
Prov-Year-Track FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Linear Interaction	Y	Y	Y	Y	Y	Y	Y	Y	Y
Quadratic Interaction	Y	Y	Y	Y	Y	Y	Y	Y	Y

(a): sample for the first stage; (b): **sample with wages** (our focus next)

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Elite Education Wage Premium

Method	(1) Local Linear	(2) Parametric	(3) Parametric	(4) Parametric	(5) Local Linear	(6) Parametric	(7) Parametric	(8) Parametric
<i>(a) Reduced-Form</i>								
Dependent Var.								
	Wage				Ln Wage			
Above Cutoff	122.2** (60.965)	247.0*** (42.358)	146.0** (56.928)	155.8** (73.176)	0.053** (0.023)	0.089*** (0.015)	0.059*** (0.021)	0.067** (0.027)
<i>(b) First-Stage</i>								
Dependent Var.								
	Elite University				Elite University			
Above Cutoff	0.162*** (0.018)	0.283*** (0.010)	0.155*** (0.019)	0.147*** (0.028)	0.162*** (0.018)	0.283*** (0.010)	0.155*** (0.019)	0.147*** (0.028)
F-statistics		779.9	68.66	27.06		779.9	68.66	27.06
<i>(c) IV Estimates</i>								
Dependent Var.								
	Wage				Ln Wage			
Elite University	754.6** (383.148)	872.6*** (98.830)	939.5*** (340.458)	1,061.5* (548.457)	0.328** (0.145)	0.325*** (0.037)	0.380*** (0.126)	0.456** (0.205)
Province-Year-Track FE		Y	Y	Y		Y	Y	Y
Linear Interaction			Y	Y			Y	Y
Quadratic Interaction				Y				Y
Observations	5,080	5,080	5,080	5,080	5,080	5,080	5,080	5,080

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Social Mobility: Industry/Occupation/Ownership

Mean	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Desirable Occupation			Desirable Industry			Desirable Ownership		
Above Cutoff * Parent (Desirable Occ)		-0.004 (0.018)	0.005 (0.018)						
Parent (Desirable Occ)	0.020** (0.008)	0.022 (0.014)	0.008 (0.013)						
Above Cutoff * Parent (Desirable Industry)				0.019 (0.046)	0.003 (0.041)				
Parent (Desirable Industry)				0.109*** (0.027)	0.099*** (0.037)	0.073** (0.032)			
Above Cutoff * Parent (Desirable Ownership)							-0.045 (0.037)	-0.014 (0.036)	
Parent (Desirable Ownership)							0.130*** (0.023)	0.156*** (0.028)	0.082*** (0.029)
Above Cutoff	-0.005 (0.008)	-0.004 (0.008)	0.003 (0.025)	-0.020 (0.022)	-0.023 (0.022)	-0.027 (0.027)	0.054* (0.028)	0.065** (0.030)	0.004 (0.044)
Prov-Year-Track FEs				Y			Y		Y
Linear Interaction				Y			Y		Y
Quadratic interaction				Y			Y		Y
Observations	4,946	4,946	4,946	5,025	5,025	5,025	5,039	5,039	5,039
R-squared	0.001	0.001	0.112	0.011	0.011	0.207	0.011	0.016	0.122

- Parental status plays an important role.
- The intergenerational correlation is not changed by scoring above the cutoff.

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Industry/Occupation/Ownership

	(1) Share(%) realized job	(2) Share (%) hoping to get a job in:	(3) Realized/Hope
(a) Occupation			
1 Mid-senior management personnel	3.65	22.08	<u>0.17</u>
2 Junior management personnel	1.24	11.83	<u>0.10</u>
3 Clerks	28.43	7.07	4.02
4 Professional	49.26	37.21	1.32
5 Technical staff	2.36	1.67	1.41
6 Foreman / group leader in factories	0.98		
7 Service personnel	4.08	1.53	2.67
8 Business Owner/Self-Employed	1.36	13.94	<u>0.10</u>
9 Skilled workers	6.65	1.51	4.40
10 Manual workers	0.44	0.4	1.10
11 Military / Police	0.4	2.3	<u>0.17</u>
12 Others	1.14	0.48	2.38

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