ELITE UNIVERSITIES AND THE PUBLIC SECTOR LABOR MARKET

Click here for the last version

[*Preliminary, please do NOT cite*]

Julio Rodríguez*

Teachers College, Columbia University

Abstract

This study aims to understand whether admission to higher education, particularly to an elite university, affects labor market outcomes in the public sector. Using administrative data on the universe of higher education applicants, together with information on all Chilean public servants, I implement a stacked regression discontinuity design that exploits variations in the minimum score needed to access a top-tier university, to causally estimate the effect of admission on the probability of working in the public sector, having a permanent contract, the level of earnings, and the likelihood of attaining a top position. The estimated effects are negative and significant for the law, business, and engineering majors on all the labor outcomes. I found differentiated impacts by gender, as the estimated results are only significant for women. Admission to public administration, a major specially designed to administer the state, does not significantly affect the labor outcomes considered.

JEL Codes: E24, I23, I26, J45

*julio.rodriguez@columbia.edu

1 Introduction

Higher education plays a fundamental role in promoting social mobility, since it is associated with better employment prospects and higher income levels within the labor market. Its importance may be even more pronounced in the public sector because access to higher-ranking positions also grants the opportunity and responsibility to propose and shape public policy decisions that directly affect citizens. Consequently, capable and well-qualified individuals assume great importance in the effective functioning of the government, justifying their placement in high-level roles within the state administration.

Ensuring equitable access to senior jobs in the public sector is also essential to guarantee that the government is more representative of the population it serves. When individuals from diverse backgrounds have equal opportunities to access the highest positions in the public sector, the government is more likely to consider the needs and perspectives of a broader range of citizens. In this way, a more representative government is likely to make more effective and equitable public policy decisions, as it reflects the experiences and needs of a diverse population.

Studying the role of higher education in gaining access to the highest positions in the public sector is crucial, given its relevance to both efficient government performance and fair access to influential jobs.

This study aims to understand whether admission to higher education, and in particular to an elite university, affects the probability of working in the public sector, the level of earnings, having a staff contract, and attaining a top position in the state administration.

Although the state is the largest employer in most economies (e.g., more than 15 percent of the total workforce in the U.S.), the literature has not paid special attention to public servants in senior positions. The public sector is particularly interesting to study, as the job assignment process and career advancement decisions are made in a political context, which may differ substantially from a market-driven environment in the private sector. These differences are also likely to influence the returns to education.

The literature of labor economics has traditionally focused on wage differentials between the public and private sectors (Mizala et al., 2011; Borjas, 2002; Adamchik and Bedi, 2000) and the role of unions (Jerch et al., 2017; Hoxby, 1996), with evidence suggesting an average positive pay premia for public sector workers, but a wage penalty for the most qualified employees. This wage compression could make it harder for the public sector to recruit and retain high-skilled workers. Recruitment can be even more difficult considering the potential problem of patronage in the personnel selection in public sector organizations (Colonnelli et al., 2020; Xu, 2018). Additionally, when political power is unevenly distributed, political elites tend to use clientelistic behaviors to maintain their position (Dal Bó et al., 2009). All these frictions in the selection process may explain the pay premia usually found relative to the private sector but also could imply a lower return to education.

A growing body of literature has been dedicated to understanding the incentives to attract talented candidates and improve management in the public sector (Muñoz and Prem, 2022; Ashraf et al., 2020; Muralidharan and Singh, 2020; Finan et al., 2017; Dal Bó et al., 2013). The results show that offering career opportunities or higher wages can attract more able applicants and that transparency and competitiveness in selection processes can lead to more effective workers being hired in the public sector. Additionally, how public servants are selected and the level of competition in political contexts play a crucial role in economic development (Ferraz et al., 2020).

On the other hand, the literature on returns to education has mainly studied how an additional year of schooling affects future labor market outcomes (Jensen, 2010; Cunha and Heckman, 2007; Card, 2001; Card, 1999, Card, 1993). More recently, research effort has turned to estimating higher education returns (Zimmerman, 2014; Oreopoulos and Petronijevic, 2013; Carneiro et al., 2011), its heterogeneity by college major (Andrews et al., 2022; Altonji and Zimmerman, 2019; Altonji et al., 2016; Kirkeboen et al., 2016; Hastings et al., 2013), and institutions' selectivity (Mountjoy and Hickman, 2021; MacLeod

et al., 2017; Dale and Krueger, 2002).

Regarding the role of institutions' selectivity in ensuring their graduates reach top positions, the economic literature has generally studied this in contexts where the private sector labor market predominates (Jia and Li, 2021; Anelli, 2020; Chetty et al., 2017; Hoekstra, 2009). Also, great attention has been placed on unequal access to top positions and differentiated educational returns by gender (i.e., glass ceiling effect) and socioeconomic status (Aguirre et al., 2022; Zimmerman, 2019; Bertrand, 2018). Attending an elite higher education institution increases wages and relates to a higher probability of completing a degree, graduating on time, and having higher-achiever peers in college. Nevertheless, in many cases, these returns are only significant for specific groups, such as (white) males with high SES.

One of the main barriers to studying the returns to higher education in the public sector labor market has been the lack of data. This study contributes to filling this gap in the literature using administrative data that includes all public servants under the executive branch of the Chilean government from 2018 onwards.

To understand how access to higher education, particularly to an elite university, allows access to positions of greater responsibility in the public sector, I match administrative data from the universe of applicants to higher education in Chile with their latter results in the public sector labor market.

The Chilean higher education application system provides an accepted and waiting list of applicants each year for all majors at the most important universities in the country. Therefore, I implement a regression discontinuity design (RDD) that allows me to identify the causal effect of admission to each major and university near the corresponding admission cut-off point. Using a *stacking* RDD strategy, I identify the effect of being admitted to one of the two most selective universities in the country on the probability of working in the public sector, the income level, the probability of having a permanent contract and accessing a top position in all public institutions of the 24 existing ministries

in Chile, from 2018 onwards.

The (preliminary) results presented in this draft show that being admitted to an elite university in Chile reduces the probability of working in the public sector, decreases the likelihood of having a staff contract, and lowers labor earnings. Importantly, admission to an elite university does not affect the probability of accessing a senior position.

A differentiated effect by gender mainly explains these results, as the effect of being admitted to an elite university on labor outcomes is statistically significant only for women.

Additionally, the results vary significantly when I explore the effect of admission to an elite university by different sets of majors. The estimated effects on all the labor outcomes are significant for the group of law, business, and engineering majors, even for accessing a higher-ranking position (negative and significant only for women). Medicine only shows negative and significant results in the probability of having a staff contract. Admission to public administration, a major specially designed to administer the state, in an elite institution does not significantly affect the labor outcomes considered.

Studying the returns of attending an elite university in the public sector is important from a public policy perspective because it can provide insights into the effectiveness of investments in higher education. If attending an elite university leads to higher earnings or more influential positions, it suggests that these universities are providing valuable skills and experiences that are in demand by public institutions. This information can then inform policy decisions related to higher education and workforce development funding. Additionally, understanding the returns to elite university admission in the public sector can help policymakers identify any disparities or inequalities in access to these opportunities, which can inform efforts to improve educational equity and personnel selection practices.

On the other hand, if there are no significant returns in the public sector of attending an elite university, it could have important implications for potential students and their

families in terms of cost savings. This may mean that students would be better off attending a less expensive institution or not going to university rather than incurring the high costs of attending an elite university. Furthermore, this information could also be used to redirect resources toward other types of institutions or educational programs that may provide greater returns on investment. Additionally, it could help allocate resources for higher education funding and for the government to invest in alternative forms of education and training that could be more beneficial for the students.

The following steps of this study comprehend the analysis of some mechanisms that might influence the returns to elite higher education admission in the public sector. For example, I will explore networks that may determine access to top positions, such as family ties (proxied by having the same last name as ministers) or having attended the same high school or university with other workers in the public sector institutions. The goal is to understand whether networking is an asset in this context and how it relates to academic meritocracy.

2 Study Context

2.1 The Chilean Public Sector

In this study, I analyze the outcomes of public sector workers under the Chilean executive power in all centralized and decentralized agencies of the 24 existing ministries from 2018 onwards. Specifically, the outcomes considered are; having worked in the public sector, having a staff contract, earning levels, and the likelihood of reaching a top position in the public administration.

The Chilean public employment model is structured mainly based on the career system, although it has incorporated different elements to the model using more temporary contracts. This system is composed of an ascending structure of positions and remunera-

tion grades linked to the importance of the function performed. A salary scale determines the remuneration structure,[1] and other general and specific allowances complement the base salary.

Civil servants may have two types of contracts:[2] *planta* (staff) and *contrata*. The former corresponds to the permanent positions assigned by law to each institution, and the latter are those that perform more transitory duties. In the last decades, there has been a steady decline in the proportion of staff officers and an increase in temporary positions, evidencing a deterioration in labor conditions in the public sector.

Within staff positions, there are career officials and trusted servants. For the former group, entry is obtained through a public competition,[3] and they can't be fired arbitrarily, so they can only lose their job under specific legally established causes. On the other hand, trusted servants are staff that has the executive's exclusive confidence,[4] those subject to the free appointment and removal by the President or of the authority empowered to make the appointment. Before the creation of the SADP (for *Sistema de Alta Dirección Pública*, or Public Senior Management System) in 2003, staff positions were not under standardized selection procedures. Since the system came into force in 2004, discretion has been attenuated to appoint and remove some of these trusted positions whose functions are predominantly the execution of public policies and direct provision of services to the community. With the SADP implementation, these positions are appointed by the Senior Public Management Council[5] and are submitted to a public contest for periods of three years (renewable).

The contrata positions arose for the need to fulfilling more transitory tasks. At first, these public positions had a maximum duration of one fiscal year, at most, and had to

[1] Although some functions and sectors have their own assignment of grades based on other remunerations scale.

[2] There is another type of contract, *honorarios*, but that personnel is not considered public servants.

[3] Positions that become vacant are replaced through internal competitions or by promotion in which the staff members of the respective service can participate. When these vacancies are not assigned through the mentioned procedures, they are open to a general entry contest.

[4] Ministers, Undersecretaries, Head Chiefs of Service, and Governors (not in the Central Government).

[5] CADP, for *Consejo de Alta Dirección Pública*.

end on December 31st of each year. Since 2017, all public institutions must elaborate and apply transparent recruitment and selection procedures based on merit, suitability, inclusion, and equal opportunities. Finally, the law establishes a limited number of contrata officials that can be hired as staff members, which cannot exceed 20 percent.

2.2 The Higher Education Application System

This subsection provides an overview of Chile's higher education admission system. Understanding this framework is essential to analyze further the effect of university admission on public-sector employment outcomes.

The CRUCH (for *Consejo de Rectores de las Universidades Chilenas*, or Rector's Council of Chilean Universities) is an organization that comprehends the country's traditional universities. It includes 30 institutions, considered the country's most prestigious and historically significant.

Students willing to study in any CRUCH institution must take the PSU (for *Prueba de Selección Universitaria*, or University Selection Test), a standardized test that can only be taken at the end of each year. The only requirement to take this test is to complete high school. Most students take the PSU at the end of their 12th grade.

The PSU assesses the cognitive abilities and aptitudes of students in various academic disciplines. The exam includes compulsory tests in two main subjects: mathematics and language (Spanish). In addition, depending on the requirements of their preferred programs and institutions, prospective candidates can take two additional tests, natural sciences and history and social sciences. The PSU scores are measured on a scale of 150 to 850 points, with 450 points being the minimum score needed to apply to any program.

Each year, after receiving their PSU results, students apply through a simultaneous, centralized, and integer system.[6] In this process, applicants list their preferred set of

[6]SUA, for *Sistema Único de Admisión*, or Single Admission System. This governing body ensures fairness and transparency in the selection process for all CRUCH universities.

eight university-major combinations. Upon reaching a cutoff point, applicants are automatically accepted to their highest listed option through a deferred acceptance algorithm (Gale and Shapley, 1962),[7] so applicants have incentives to rank their options according to their true preferences. All the other institution-major combinations in the list are discarded.

Each university-major combination uses specific and publicly known weights for the different PSU subject exams. Therefore, the weighted score used to apply to major m, in the university u, in cohort c, is a composite of different PSU subject exams that can be expressed as:

$$PSU_{muc} = \sum_{s}^{S} w_{muc,s} \cdot PSU_s\,, \qquad \forall\ s = \text{Math, Spanish, Science, and History.}$$

Importantly, no other factors are considered in the admission process (e.g., statements of purpose), and applicants cannot predict the exact PSU's cutoff point of each institution-major because they vary yearly depending on the available slots in each institution and the applicants' demand.

[7] Similar to school choice systems in Boston and New York City.

3 Data and Sample

3.1 Public Sector Data

[*To be completed*]

- *Public sector data from 2018 to 2021 (currently expanding it to May 2023)*
- *Add definition of top position (Figure A.1)*
- *Add justification to examine specific majors (Figure A.3)*

3.2 Applications Data

[*To be completed*]

- *Two most selective universities considered as elite (PUC and UCh)*

4 Methodology

The greatest challenge to causally estimating the effect of admission to higher education on labor outcomes is that directly comparing the individuals admitted to a university with those not would generate biased estimates. Universities select their students, and at the same time, students decide where to apply, so the groups of admitted and not admitted individuals will differ in observable and non-observable characteristics. These differences will also likely determine individuals' labor outcomes; therefore, both groups won't be comparable, and the estimates will be biased.

The Chilean higher education admission system offers a unique opportunity to address this challenge. Applicants can't precisely predict the minimum test scores needed to be admitted to each program, as they vary yearly depending on the available slots in each institution and the corresponding applicants' demand of each cohort. Consequently, falling just above or below the cutoff point can be considered random, and both groups would not have any difference in observable or unobservable characteristics. Thus, I can estimate the local average treatment effect (LATE) of admission to a major-institution combination for the group near the cutoff point using an RDD, comparing applicants with PSU scores just above with those just below the program's cutoff point.

The estimating equation has the form

$$Y_{imuc} = f\left(x_{imuc}\right) + \delta D_{imuc} + \epsilon_{imuc}, \tag{1}$$

where Y_{imuc} are the labor outcomes of interest for student i applying to major m, in university u, in application cohort c; x_{imuc} is the student's PSU weighted score for major m in university u (i.e., the running variable), and $f\left(\cdot\right)$ is a smooth function. D_{imuc} is an indicator variable that takes value 1 if the student's score is higher or equal to the program-specific cutoff point (and therefore admitted to major m in university u) and 0 otherwise. The δ parameter captures the LATE of admission to program m in university u on the

corresponding outcome Y_{imuc}.

Every year, the admission system generates thousands of cutoffs, each corresponding to a specific major and institution combination. Equation (1) represents the empirical strategy to estimate the admission effect of a single major in a specific university, exploiting a single cutoff point.

As mentioned, the treatment assignment in the RDD context is as good as random conditional on observables. For this reason, the running variable is included in the estimation equation for identification purposes. If the relationship between the outcome and the running variable is assumed to be linear, the function $f(\cdot)$ would be a polynomial of grade 1. But to allow for non-linearities, a polynomial of a superior grade can be used. More importantly, an interaction of the polynomial with the indicator variable to allow for different slopes at each side of the cutoff is included. However, choosing an incorrect functional form leads to bias (Gelman and Imbens, 2019), so the literature has been moving to non-parametric local linear regression (Hahn et al., 2001). Finally, while not considered in equation (1), other observable characteristics can be included in the specification to increase the estimates' precision.

To estimate the LATE of admission to an elite university on labor outcomes, I use a stacked RDD approach following Abdulkadiroğlu et al. (2014), Pop-Eleches and Urquiola (2013) and Hastings et al. (2013). Specifically, my empirical strategy pools applications' data across all majors in the two more selective universities of the country (PUC and UCh), centering all the corresponding cutoffs. Therefore, a new running variable is generated by subtracting the specific program cutoff point from applicants' weighted PSU scores ($x_{imuc} - c_{muc}$), representing the distance to each program-specific cutoff. The estimated equation is

$$Y_{imuc} = f(x_{imuc} - c_{muc}) + \beta D_{imuc} + \gamma_{muc} + \varepsilon_{imuc}, \qquad \forall\, u = \text{PUC, UCh.} \tag{2}$$

Equation (2) also includes program-year fixed effects (γ_{muc}), and the estimated parameter $\hat{\beta}$ in this stack represents a weighted average of program-specific admission effects in an elite university. Importantly, the standard errors are clustered at the individual level as the same applicant can be in more than one of these singular RDs (e.g., in two different programs' waiting lists).

I will also estimate the admission effects to specific majors in elite universities separately, as they can face different labor markets within the public sector. More specifically, the state is a large provider of health services to the public. This justifies the study of medicine (the most selective major in Chile) separately, as medics' outside options in the private labor market might be proportionally fewer than other programs. Similarly, I will explore admission effects to law, engineering, and business majors in elite universities as they have been shown to be highly represented in managerial positions in the public sector (Fenizia, 2022) and also among top positions in the private sector (Zimmerman, 2019). A third program that justifies its separate study is that of public administrators, given that its main labor application is precisely in the state administration.

Finally, I will explore heterogeneous effects of admission by gender, as women have been documented to be over-represented in the public sector relative to their men counterparts.

5 Results

5.1 Regression Discontinuity Validity

The identification assumption in the RDD approach to obtain unbiased estimates is *continuity*, and it requires the expected value of the potential outcomes to be continuous on the running variable at the threshold. In other words, the potential outcomes should not jump at the cutoff point in the absence of the treatment. Implicitly, this assumption means that observable and non-observable characteristics that could determine the outcome (Y_{imuc})

are continuous on the running variable (x_{imuc}). In practice, the continuity assumption requires applicants near each side of the cutoff to be similar in variables affecting their future labor outcomes, like socioeconomic status and motivation. If these conditions are satisfied, RDD will provide valid (comparable) treatment and control groups at each side of the threshold, as the treatment assignment would be as good as random (conditional on observables) near the cutoff.

The continuity assumption would be violated if, for example, applicants can sort themselves at the right of the cutoff. This invalidates the identification strategy, as treatment and control groups would not be comparable due to a selection problem. In other words, students should not be able to manipulate their test scores (e.g., increasing their effort) to fall just above the acceptance threshold, implying self-selection of the highly motivated students into the treatment group. Consequently, unobservable factors that could determine future earnings (as motivation) would not be continuous at the cutoff.

One way to shed light on this is by looking for discontinuities of other predetermined observable variables. Another approach is examining the distribution density of applicants close to the cutoff (McCrary, 2008). This phenomenon is unlikely to happen in the admission to higher education context because students do not know ex-ante the precise cutoff (Hoekstra, 2009). Additionally, institutions usually set the acceptance threshold to achieve a target enrollment level and not for specific characteristics of students.

To verify the validity of this assumption, I run manipulation tests for the running variable using a local polynomial density estimation (Cattaneo et al., 2021; Cattaneo et al., 2020). In the presence of manipulation, a higher density of applicants just at the right of the centered cutoff should be observed, reflecting the non-random sorting of applicants. Figure 1 shows no significant accumulation of applicants just above the cutoff point, providing supporting evidence of no manipulation. Additionally, the formal test shows no statistical evidence of systematic manipulation of the running variable, as the null hypothesis of no manipulation can't be rejected (p-value = 0.71).

Further, I also examine applicants' baseline characteristics' continuity. For this purpose, I estimate equation (2) with applicants' characteristics as dependent variables. Figure 2 shows the estimated coefficient $(\hat{\beta})$ for each case. None of the estimated coefficients is statistically different from zero. Despite this being a necessary but not sufficient condition, as is also needed balance of unobserved characteristics, these results support the validity of the continuity assumption in my analytical sample.

5.2 Main Results

Admission to an elite university is critical in shaping outcomes and career trajectories in the public sector labor market. The analysis presented here shows that the effect of admission to an elite university on various dimensions of public-sector employment is substantial and statistically significant. In this section, I present overall findings of admission to an elite university irrespective of the major, starting with the negative impact on public sector employability and moving on to the effect on recruitment, earnings, and attainment of top positions.

First, the estimated results presented in Table 1 show that admission to an elite university has a negative and statistically significant effect of about 1 percentage point on the probability of working in the public sector. This effect represents a 7% decrease over the control group mean of 13%. These findings show that individuals admitted to elite universities are later less likely to pursue careers in the public sector.

Based on this finding, I further investigate the effect of admission to an elite university on the probability of having a staff contract in the public sector. The estimates presented in Table 2 reveal a significant decrease of 0.4 percentage points in the likelihood of having a staff contract, representing a 15% decrease over the control group mean.

In addition to the effects on employment and employee contracts, I examine the relationship between entry into elite universities and earnings in the public sector labor market. The regression discontinuity results presented in Table 3 show that people admitted

to an elite university tend to have lower average incomes than their counterfactuals. The estimated coefficient show that, overall, earnings are about 12% lower for those admitted to an elite university. This suggests that the perceived benefits of an elite education do not necessarily translate into greater financial rewards in the public sector labor market.

Finally, I examine whether attending an elite university affects the probability of attaining top positions in the public sector. Interestingly, the results in Table 4 show a null effect, suggesting that admission to elite universities does not significantly affect the probability of attaining top positions. Although this finding challenges the hypothesis of a direct link between elite education and top positions in the public sector, it raises important questions about the complex factors contributing to career development in this context.

Interestingly, when examining the effects of elite university admissions by gender in the public sector labor market, the analysis reveals an important difference. Although the point estimates for men correspond to the overall results, it is important to note that the estimates for this group are not statistically significant. Conversely, women's results show a significant negative effect, with larger point estimates. These differences by gender suggest that the link between elite university admissions and public sector outcomes is particularly pronounced for women. This nuanced understanding highlights the importance of considering gender as a critical factor in studying the complex dynamics of career outcomes in the public sector labor market.

5.3 Results by Major

Intriguing patterns emerge when examining the impact of admission to different majors at elite universities on the public sector labor market outcomes.

The results presented in Table A.1 show that, overall, applicants admitted to law, business, or engineering in elite universities have a 1 percentage point lower likelihood of working in the public sector. The estimated effect represents a 25 percent reduction compared to the control group's mean. As with the overall results, the point estimates show

a negative effect for men, but it is not statistically different from zero. However, this negative effect is statistically significant for women.

On the other hand, the results show different dynamics for medicine and public administration admissions to elite universities (see Tables A.2 and A.3). Although these majors positively affect the probability of working in the public sector, the effects are not statistically different from zero. While admission to elite universities in these majors may influence career choices, it does not guarantee a significant advantage in the public sector.

Shifting the focus to the effect on staff contracts, Tables A.5 and A.6 show an overall negative effect of admissions to elite law, business, or engineering majors and medicine in elite universities. In particular, the estimated effect for law, business, or engineering majors is a significant decrease of 0.4 percentage points, which is a 50% decrease relative to the control group's mean. Similarly, for medicine, there is a significant decrease of 3 percentage points, corresponding to a 45% decrease from baseline. It is worth noting that these significant results are again observed mainly in women. In contrast, admission to public administration in an elite university shows a positive effect, but it is not statistically different from zero.

Further, admitted students to law, business, or engineering majors in elite universities have 16% lower earnings in the public sector (Table A.7). This effect is, again, only statistically significant for women, suggesting a potential public sector wage penalty for women admitted to these majors. Conversely, Tables A.8 and A.9 show that the point estimates for admission to medical and public administration degrees in elite universities are positive but not statistically significant.

Finally, when examining the probability of reaching top positions in the public sector, a negative effect is observed in all three main groups of majors (see Tables A.10, A.11, and A.12). However, statistical significance is only observed for women admitted to law, business, or engineering.

In sum, the analysis of admissions to various majors at elite universities provides valu-

able insights into the complex dynamics of career outcomes in the public sector labor market. The findings show differences between majors, with majors in law, business, or engineering hurting public sector employment, employee contracts, monthly wages (for women), and the likelihood of top positions (for women). Medicine and public administration show more nuance, with positive but statistically insignificant effects on employment and public sector income. These results highlight the importance of considering the interplay between educational choices, gender, and career paths in the specific context of the public sector.

6 Conclusion

[*To be completed*]

REFERENCES

Abdulkadiroğlu, A., Angrist, J., & Pathak, P. (2014). The elite illusion: Achievement effects at boston and new york exam schools. *Econometrica*, *82*(1), 137–196. https://doi.org/10.3982/ECTA10266

Adamchik, V. A., & Bedi, A. S. (2000). Wage differentials between the public and the private sectors: Evidence from an economy in transition. *Labour Economics*, *7*(2), 203–224.

Aguirre, J., Matta, J., & Montoya, A. M. (2022). Joining the old boys' club: Women's returns to majoring in technology and engineering. *[Unpublished manuscript]*.

Altonji, J. G., Arcidiacono, P., & Maurel, A. (2016). The analysis of field choice in college and graduate school. determinants and wage effects. In E. A. Hanushek, S. Machin, & L. Woessmann (Eds.), *Handbook of the economics of education* (pp. 305–396). Elsevier. 10.1016/B978-0-444-63459-7.00007-5

Altonji, J. G., & Zimmerman, S. D. (2019). The costs of and net returns to college major. In C. M. Hoxby & K. Stange (Eds.), *Productivity in higher education* (pp. 133–176). University of Chicago Press. https://www.nber.org/books-and-chapters/productivity-higher-education/costs-and-net-returns-college-major

Andrews, R. J., Imberman, S. A., Lovenheim, M. F., & Stange, K. M. (2022). The returns to college major choice: Average and distributional effects, career trajectories, and earnings variability. *National Bureau of Economic Research Working Paper #30331*. https://doi.org/10.3386/w30331

Anelli, M. (2020). The returns to elite university education: A quasi-experimental analysis. *Journal of the European Economic Association*, *18*(6), 2824–2868. https://doi.org/10.1093/jeea/jvz070

Ashraf, N., Bandiera, O., Davenport, E., & Lee, S. S. (2020). Losing prosociality in the quest for talent? sorting, selection, and productivity in the delivery of public services. *American Economic Review*, *110*(5), 1355–1394. https://doi.org/10.1257/aer.20180326

Bertrand, M. (2018). Coase lecture – the glass ceiling. *Economica*, *85*, 205–231. https://doi.org/10.1111/ecca.12264

Borjas, G. J. (2002). The wage structure and the sorting of workers into the public sector. *National Bureau of Economic Research Working Paper #9313*. https://doi.org/10.3386/w9313

Card, D. (1993). Using geographic variation in college proximity to estimate the return to schooling. *National Bureau of Economic Research Working Paper #4483*. https://doi.org/10.3386/w4483

Card, D. (1999). The causal effect of education on earnings. In O. C. Ashenfelter & D. Card (Eds.), *Handbook of labor economics* (pp. 1801–1863). Elsevier. https://doi.org/10.1016/S1573-4463(99)03011-4

Card, D. (2001). Estimating the return to schooling: Progress on some persistent econometric problems. *Econometrica*, *69*(5), 1127–1160. https://doi.org/10.1111/1468-0262.00237

Carneiro, P., Heckman, J. J., & Vytlacil, E. J. (2011). Estimating marginal returns to education. *American Economic Review*, *101*(6), 2754–2781. https://doi.org/10.1257/aer.101.6.2754

Cattaneo, M. D., Jansson, M., & Ma, X. (2020). Simple local polynomial density estimators. *Journal of the American Statistical Association*, *115*(531), 1449–1455.

Cattaneo, M. D., Jansson, M., & Ma, X. (2021). Local regression distribution estimators. *Journal of Econometrics*. https://doi.org/10.1016/J.JECONOM.2021.01.006

Chetty, R., Friedman, J. N., Saez, E., Turner, N., & Yagan, D. (2017). Mobility report cards: The role of colleges in intergenerational mobility. *National Bureau of Economic Research Working Paper #23618*. https://doi.org/10.3386/w23618

Colonnelli, E., Prem, M., & Teso, E. (2020). Patronage and selection in public sector organizations. *American Economic Review*, *110*(10), 3071–3099. https://doi.org/10.1257/aer.20181491

Cunha, F., & Heckman, J. J. (2007). Identifying and estimating the distributions of ex post and ex ante returns to schooling. *Labour Economics*, *14*(6), 870–893. https://doi.org/10.1016/j.labeco.2007.06.002

Dal Bó, E., Dal Bó, P., & Snyder, J. (2009). Source: The review of economic studies. *Review of Economic Studies*, *76*(1), 115–142. https://doi.org/10.1111/j.1467-937X.2008.00519.x

Dal Bó, E., Finan, F., & Rossi, M. (2013). Strengthening state capabilities: The role of financial incentives in the call to public service. *Quarterly Journal of Economics*, *128*(3), 1169–1218. https://doi.org/10.1093/qje/qjt008

Dale, S. B., & Krueger, A. B. (2002). Estimating the payoff to attending a more selective college: An application of selection on observables and unobservables. *Quarterly Journal of Economics*, *117*(4), 1491–1527. https://doi.org/10.1162/003355302320935089

Fenizia, A. (2022). Managers and productivity in the public sector. *Econometrica*, *90*(3), 1063–1084. https://doi.org/10.3982/ecta19244

Ferraz, C., Finan, F., & Martinez-Bravo, M. (2020). Political power, elite control, and long-run development: Evidence from brazil. *National Bureau of Economic Research Working Paper #27456*. https://doi.org/10.3386/w27456

Finan, F., Olken, B. A., & Pande, R. (2017). The personnel economics of the developing state. In A. Banerjee & E. Duflo (Eds.), *Handbook of economic field experiments* (pp. 467–514). Elsevier. https://doi.org/10.1016/bs.hefe.2016.08.001

Gale, D., & Shapley, L. S. (1962). College admissions and the stability of marriage. *The American Mathematical Monthly*, *69*(1), 9–15. https://doi.org/10.1080/00029890.1962.11989827

Gelman, A., & Imbens, G. (2019). Why high-order polynomials should not be used in regression discontinuity designs. *Journal of Business & Economic Statistics*, *37*(3), 447–456. https://doi.org/10.1080/07350015.2017.1366909

Hahn, J., Todd, P., & Van der Klaauw, W. (2001). Identification and estimation of treatment effects with a regression-discontinuity design. *Econometrica*, *69*(1), 201–209. http://www.jstor.org/stable/2692190

Hastings, J. S., Neilson, C. A., & Zimmerman, S. D. (2013). Are some degrees worth more than others? evidence from college admission cutoffs in chile. *National Bureau of Economic Research Working Paper #19241*. https://doi.org/10.3386/w19241

Hoekstra, M. (2009). The effect of attending the flagship state university on earnings: A discontinuity-based approach. *Review of Economics and Statistics*, *91*(4), 717–724. https://doi.org/10.1162/rest.91.4.717

Hoxby, C. M. (1996). How teachers' unions affect education production. *Quarterly Journal of Economics*, *111*(3), 671–718. https://doi.org/10.2307/2946669

Jensen, R. (2010). The (perceived) returns to education and the demand for schooling. *Quarterly Journal of Economics*, *125*(2), 515–548. https://doi.org/10.1162/qjec.2010.125.2.515

Jerch, R., Kahn, M. E., & Li, S. (2017). The efficiency of local government: The role of privatization and public sector unions. *Journal of Public Economics*, *154*, 95–121. https://doi.org/10.1016/j.jpubeco.2017.08.003

Jia, R., & Li, H. (2021). Just above the exam cutoff score: Elite college admission and wages in china. *Journal of Public Economics*, *196*. https://doi.org/10.1016/j.jpubeco.2021.104371

Kirkeboen, L. J., Leuven, E., & Mogstad, M. (2016). Field of study, earnings, and self-selection. *Quarterly Journal of Economics*, *131*(3), 1057–1111. https://doi.org/10.1093/qje/qjw019

MacLeod, W. B., Riehl, E., Saavedra, J. E., & Urquiola, M. (2017). The big sort: College reputation and labor market outcomes. *American Economic Journal: Applied Economics*, *9*(3), 223–261. https://doi.org/10.1257/app.20160126

McCrary, J. (2008). Manipulation of the running variable in the regression discontinuity design: A density test. *Journal of Econometrics*, *142*(2), 698–714. https://doi.org/10.1016/j.jeconom.2007.05.005

Mizala, A., Romaguera, P., & Gallegos, S. (2011). Public-private wage gap in latin america (1992-2007): A matching approach. *Labour Economics*, *18*(SUPPL. 1), S115–S131. https://doi.org/10.1016/j.labeco.2011.08.004

Mountjoy, J., & Hickman, B. R. (2021). The returns to college(s): Relative value-added and match effects in higher education. *National Bureau of Economic Research Working Paper #29276*. https://doi.org/10.3386/w29276

Muñoz, P., & Prem, M. (2022). Managers' productivity and recruitment in the public sector. *[Unpublished manuscript]*.

Muralidharan, K., & Singh, A. (2020). Improving public sector management at scale? experimental evidence on school governance. *National Bureau of Economic Research Working Paper #28129*. https://doi.org/10.3386/w28129

Oreopoulos, P., & Petronijevic, U. (2013). Making college worth it: A review of research on the returns to higher education. *National Bureau of Economic Research Working Paper #19053*. https://doi.org/10.3386/w19053

Pop-Eleches, C., & Urquiola, M. (2013). Going to a better school: Effects and behavioral responses. *American Economic Review*, *103*(4), 1289–1324. https://doi.org/10.1257/aer.103.4.1289

Xu, G. (2018). The costs of patronage: Evidence from the british empire. *American Economic Review*, *118*(11), 3170–98. https://doi.org/10.1257/aer.20171339

Zimmerman, S. D. (2014). The returns to college admission for academically marginal students. *Journal of Labor Economics*, *32*(4), 711–754. https://doi.org/10.1086/676661

Zimmerman, S. D. (2019). Elite colleges and upward mobility to top jobs and top incomes. *American Economic Review*, *109*(1), 1–47. https://doi.org/10.1257/aer.20171019

Figures

Figure 1: Manipulation Test

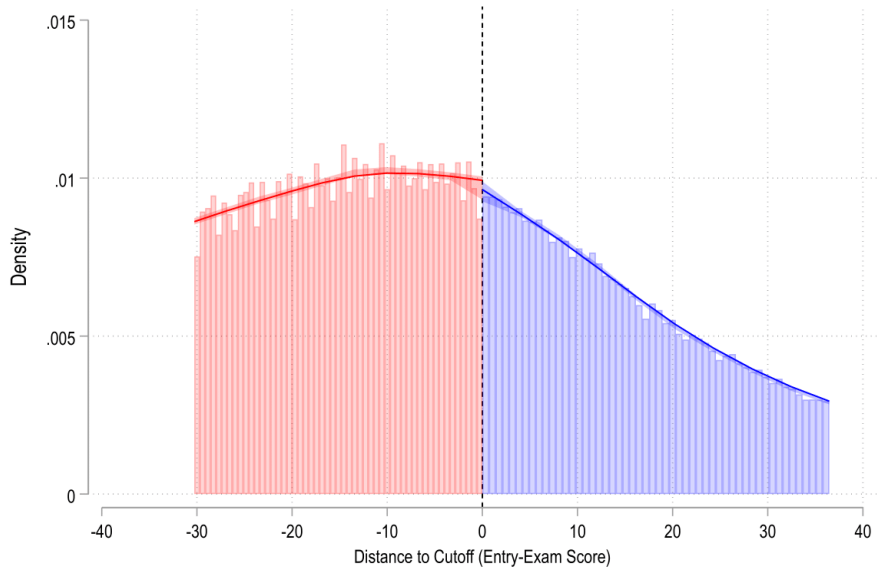
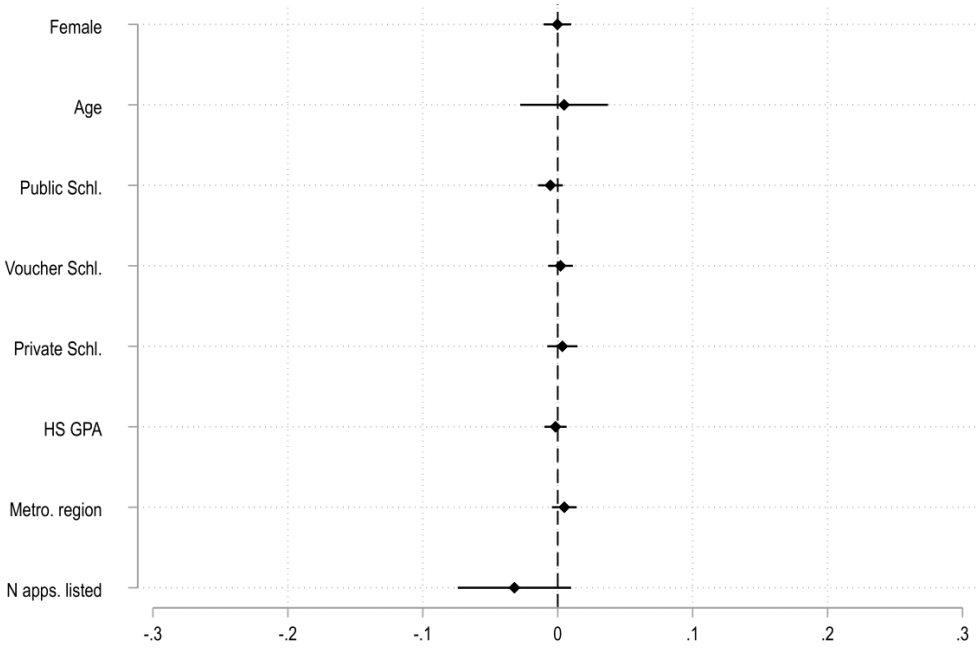


Figure 2: Continuity Test



Tables

Table 1: Admission to Elite University on Working in Public Sector

	Overall	Male	Female
Local polynomial	-0.009***	-0.006	-0.012***
	(0.003)	(0.004)	(0.005)
Control group mean	0.124	0.100	0.144
Optimal BW	31.4	33.7	35.4
N	205,718	104,246	116,413
Linear	-0.008*	-0.004	-0.011*
	(0.004)	(0.006)	(0.006)
Control group mean	0.128	0.108	0.147
BW	10.0	10.0	10.0
N	76,955	37,238	39,716

Table 2: Admission to Elite University on Staff Contract

	Overall	Male	Female
Local polynomial	-0.004**	-0.003	-0.004*
	(0.002)	(0.002)	(0.002)
Control group mean	0.027	0.021	0.032
Optimal BW	32.6	33.0	29.6
N	211,264	102,661	101,806
Linear	-0.005**	-0.004	-0.007**
	(0.002)	(0.003)	(0.003)
Control group mean	0.027	0.022	0.032
BW	10.0	10.0	10.0
N	76,955	37,238	39,716

Table 3: Admission to Elite University on Log Monthly Earnings

	Overall	Male	Female
Local polynomial	-0.135***	-0.095	-0.174***
	(0.046)	(0.058)	(0.065)
Control group mean	1.745	1.414	2.022
Optimal BW	29.9	32.6	34.8
N	198,050	101,704	114,963
Linear	-0.119**	-0.062	-0.172*
	(0.060)	(0.080)	(0.090)
Control group mean	1.826	1.545	2.083
BW	10.0	10.0	10.0
N	76,955	37,238	39,716

Table 4: Admission to Elite University on Top Position

	Overall	Male	Female
Local polynomial	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)
Control group mean	0.003	0.004	0.002
Optimal BW	31.6	31.1	26.6
N	206,721	98,429	93,502
Linear	-0.000	0.001	-0.001
	(0.001)	(0.001)	(0.001)
Control group mean	0.004	0.005	0.003
BW	10.0	10.0	10.0
N	76,955	37,238	39,716

A APPENDIX

A.1 Figures

Figure A.1: Top Position Definition

Salary scale grade	Govt. authorities, senior service chiefs	Managers (professional)	Managers (non-professional)	Professionals	Technicians, administrative and auxiliaries
A	8,424,014				
B	7,805,805				
C	7,217,956				
1-A	3,364,759				
1-B	3,445,450				
1-C	3,389,548	3,458,714	2,248,893		
2	3,334,590	3,334,085	2,212,114		
3	3,179,344	3,178,335	2,123,082		
4	3,032,770	3,031,251	2,038,626	2,982,523	
5	2,655,506	2,693,437	1,673,244	2,568,712	
6		2,461,138	1,569,843	2,417,531	
7		2,232,668	1,449,481	2,207,538	
8		2,031,271	1,344,313	2,011,540	
9		1,846,890	1,217,572	1,847,864	879,621
10		1,694,189	1,119,035	1,695,059	832,244
11		1,556,775	1,029,770	1,557,538	785,374
12		1,430,593	948,255	1,431,243	748,362
13				1,300,149	708,331
14				1,192,893	668,721
15				1,094,685	634,628
16				1,004,665	59,375
17				922,263	564,093
18				832,543	539,716
19				761,821	517,885
20				696,221	486,324
21				638,289	46,029
22				587,189	419,867
23				541,325	385,959
24					357,576
25					337,964
26					316,149
27					295,077
28					280,584
29					266,479
30					25,372
31					241,722

Figure A.2: Admission on Enrollment

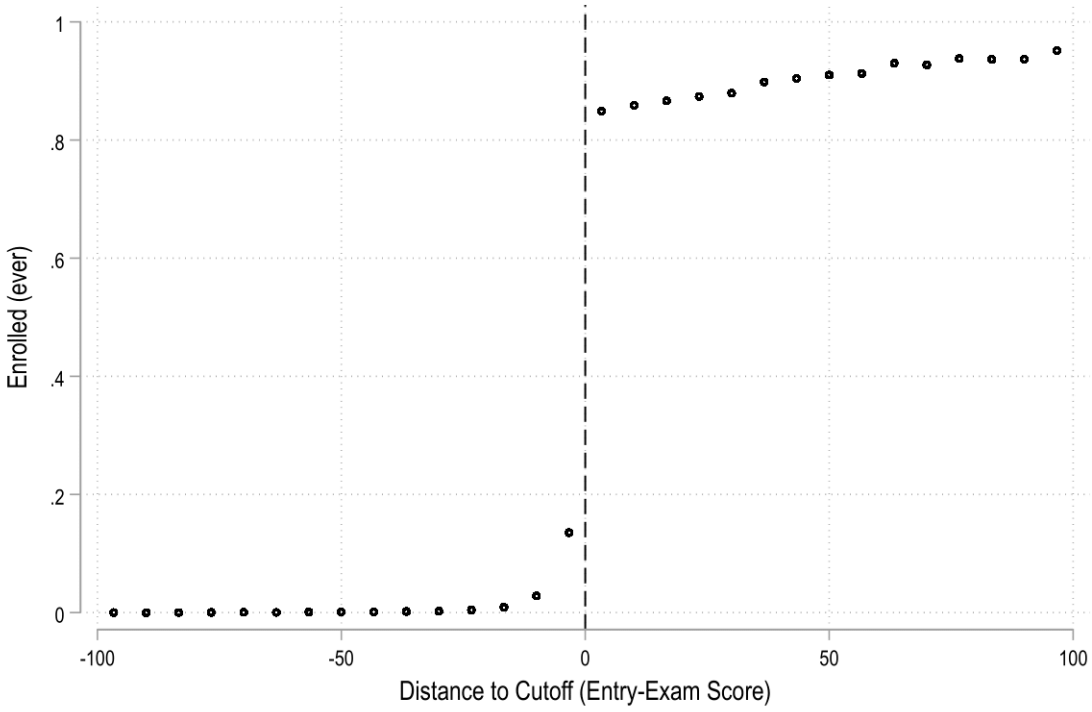
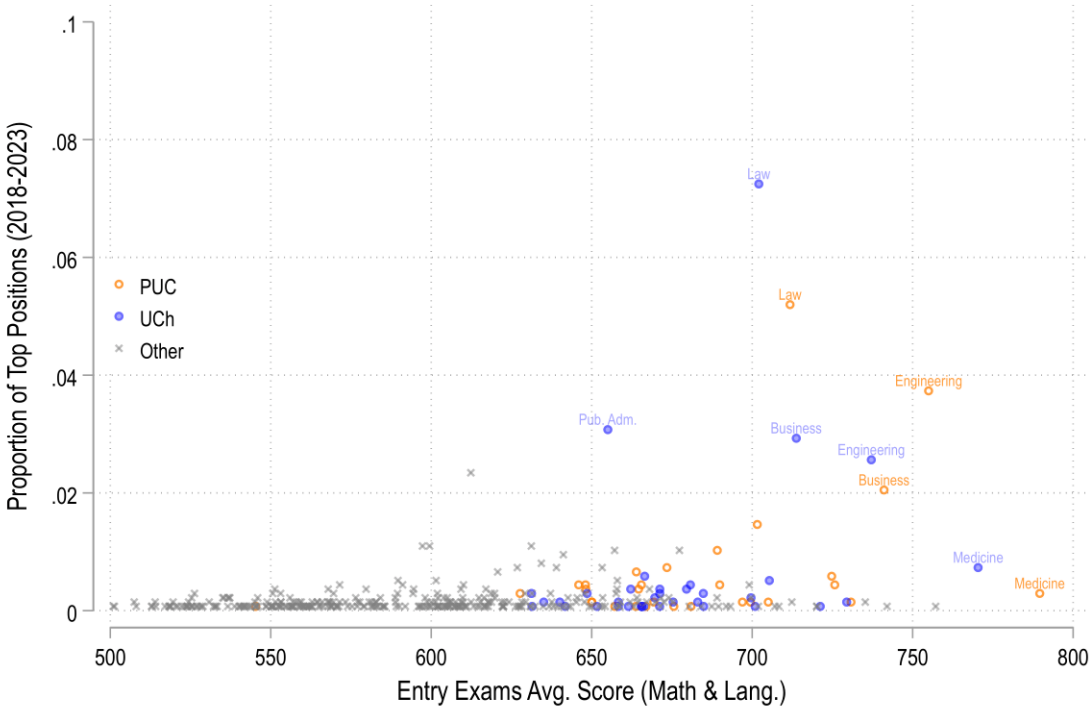


Figure A.3: Majors Selectivity and Proportion of Top Positions



A.2 Tables

Table A.1: Admission to Law, Business, or Engineering in Elite University on Working in Public Sector

	Overall	Male	Female
Local polynomial	-0.012**	-0.008	-0.022**
	(0.005)	(0.006)	(0.010)
Control group mean	0.047	0.040	0.061
Optimal BW	31.0	28.3	27.6
N	52,483	32,304	16,299
Linear	-0.013**	-0.007	-0.025*
	(0.006)	(0.007)	(0.012)
Control group mean	0.057	0.047	0.076
BW	10.0	10.0	10.0
N	19,309	12,749	6,559

Table A.2: Admission to Medicine in Elite University on Working in Public Sector

	Overall	Male	Female
Local polynomial	0.016	0.031	0.009
	(0.027)	(0.036)	(0.043)
Control group mean	0.326	0.334	0.318
Optimal BW	18.8	20.1	15.9
N	6,653	3,852	2,619
Linear	0.026	0.060	-0.010
	(0.028)	(0.039)	(0.042)
Control group mean	0.486	0.490	0.481
BW	10.0	10.0	10.0
N	3,773	2,071	1,702

Table A.3: Admission to Pub. Adm. in Elite University on Working in Public Sector

	Overall	Male	Female
Local polynomial	0.052	0.015	0.088
	(0.041)	(0.066)	(0.059)
Control group mean	0.175	0.164	0.185
Optimal BW	25.0	18.4	23.7
N	2,656	1,047	1,247
Linear	0.043	0.018	0.075
	(0.049)	(0.072)	(0.071)
Control group mean	0.202	0.214	0.192
BW	10.0	10.0	10.0
N	1,175	587	588

Table A.4: Admission to Law, Business, or Engineering in Elite University on Staff Contract

	Overall	Male	Female
Local polynomial	-0.004**	-0.003	-0.007*
	(0.002)	(0.002)	(0.003)
Control group mean	0.008	0.008	0.009
Optimal BW	22.3	37.7	18.5
N	40,282	40,065	11,659
Linear	-0.005**	-0.004	-0.007*
	(0.002)	(0.003)	(0.004)
Control group mean	0.009	0.009	0.009
BW	10.0	10.0	10.0
N	19,309	12,749	6,559

Table A.5: Admission to Medicine in Elite University on Staff Contract

	Overall	Male	Female
Local polynomial	-0.029*	0.009	-0.090***
	(0.017)	(0.026)	(0.032)
Control group mean	0.064	0.060	0.067
Optimal BW	17.4	13.9	11.2
N	6,240	2,805	1,899
Linear	-0.036**	-0.001	-0.082***
	(0.018)	(0.024)	(0.029)
Control group mean	0.084	0.067	0.102
BW	10.0	10.0	10.0
N	3,773	2,071	1,702

Table A.6: Admission to Pub. Adm. in Elite University on Staff Contract

	Overall	Male	Female
Local polynomial	0.016	0.042	0.009
	(0.020)	(0.030)	(0.024)
Control group mean	0.030	0.033	0.028
Optimal BW	21.5	18.0	24.4
N	2,337	1,026	1,279
Linear	0.035	0.080**	0.001
	(0.024)	(0.040)	(0.032)
Control group mean	0.039	0.054	0.026
BW	10.0	10.0	10.0
N	1,175	587	588

Table A.7: Admission to Law, Business, or Engineering in Elite University on Log Monthly Earnings

	Overall	Male	Female
Local polynomial	-0.179**	-0.117	-0.302**
	(0.073)	(0.086)	(0.146)
Control group mean	0.678	0.566	0.867
Optimal BW	31.1	28.8	28.5
N	52,703	32,853	16,735
Linear	-0.197**	-0.106	-0.352*
	(0.093)	(0.105)	(0.181)
Control group mean	0.830	0.684	1.102
BW	10.0	10.0	10.0
N	19,309	12,749	6,559

Table A.8: Admission to Medicine in Elite University on Log Monthly Earnings

	Overall	Male	Female
Local polynomial	0.175	0.463	0.008
	(0.394)	(0.519)	(0.622)
Control group mean	4.685	4.812	4.576
Optimal BW	18.8	20.3	16.2
N	6,653	3,882	2,670
Linear	0.351	0.891	-0.243
	(0.415)	(0.566)	(0.612)
Control group mean	7.072	7.150	6.983
BW	10.0	10.0	10.0
N	3,773	2,071	1,702

Table A.9: Admission to Pub. Adm. in Elite University on Log Monthly Earnings

	Overall	Male	Female
Local polynomial	0.778	0.284	1.228
	(0.586)	(0.947)	(0.854)
Control group mean	2.493	2.343	2.643
Optimal BW	24.6	18.3	23.5
N	2,622	1,039	1,234
Linear	0.592	0.259	1.026
	(0.705)	(1.028)	(1.015)
Control group mean	2.899	3.043	2.763
BW	10.0	10.0	10.0
N	1,175	587	588

Table A.10: Admission to Law, Business, or Engineering in Elite University on Top Position

	Overall	Male	Female
Local polynomial	-0.003	-0.001	-0.007*
	(0.002)	(0.002)	(0.004)
Control group mean	0.005	0.005	0.004
Optimal BW	23.0	29.6	17.0
N	41,228	33,522	10,761
Linear	-0.002	0.000	-0.008*
	(0.002)	(0.003)	(0.004)
Control group mean	0.006	0.006	0.007
BW	10.0	10.0	10.0
N	19,309	12,749	6,559

Table A.11: Admission to Medicine in Elite University on Top Position

	Overall	Male	Female
Local polynomial	-0.003	-0.004	-0.005
	(0.003)	(0.003)	(0.006)
Control group mean	0.002	0.002	0.002
Optimal BW	16.2	19.0	11.8
N	5,876	3,682	2,014
Linear	-0.003	-0.005	-0.000
	(0.003)	(0.003)	(0.004)
Control group mean	0.003	0.004	0.003
BW	10.0	10.0	10.0
N	3,773	2,071	1,702

Table A.12: Admission to Pub. Adm. in Elite University on Top Position

	Overall	Male	Female
Local polynomial	-0.013	-0.009	-0.021
	(0.015)	(0.020)	(0.021)
Control group mean	0.013	0.018	0.009
Optimal BW	18.2	25.5	14.9
N	2,025	1,374	829
Linear	-0.003	0.004	-0.008
	(0.017)	(0.029)	(0.021)
Control group mean	0.026	0.034	0.019
BW	10.0	10.0	10.0
N	1,175	587	588