ELITE UNIVERSITIES AND THE PUBLIC SECTOR LABOR MARKET

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Julio Rodríguez*

Job Market Paper

Columbia University

Abstract

The prevalence of graduates from elite universities in top positions within the corporate world is as high as the one observed in the public sector. This paper studies the effect of enrolling in an elite university on post-college labor outcomes within the state administration, a crucial sector in most economies. I estimate the causal effect of enrollment in an elite university relative to a non-elite university on the likelihood of working in the public sector and of attaining a top position. To do so, I combine rich administrative data on applications to higher education and public servants' records in Chile with a stacked fuzzy regression discontinuity design that exploits variations in the minimum scores needed to access university programs. Importantly, I use applicants' listed preferences of majors to narrow the comparison between individuals with similar preferences. I find that individuals who gain access to elite universities are 9% less likely to work in the public sector and as likely to reach a top position in that sector as individuals attending non-elite institutions. This result does not vary when I compare elite relative to non-elite universities among the most prevalent majors in top positions. Nevertheless, for specific majors, heterogeneous analyses show that elite university enrollment has a positive effect on reaching a leading position in the public sector for students from lower SES background. These results suggest that despite reducing the likelihood of working in the public sector, elite universities have the potential to facilitate social mobility in public administration.

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*julio.rodriguez@columbia.edu

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1 Introduction

A disproportionate number of public servants in leadership roles come from only a few elite universities. This raises a crucial question: is this correlation a result of the environment these institutions foster, equipping graduates with specialized tools for the public sector? Or is it because students who have a vocation for public service prefer to study in such institutions? Answering these questions is important because bureaucrats are in charge of public policies on which the welfare of the population depends, and attracting the most qualified graduates to these positions emerges as a key challenge in developing countries (Borjas, 2002; Tsai et al., 2015; Martinez-Bravo, 2017; Fenizia, 2022; Best et al., 2023).

The literature has heavily focused on understanding the effects of attending elite institutions on private sector labor outcomes, particularly on measures of success such as reaching top positions in the industry or belonging to the highest percentiles of the income distribution (Zimmerman, 2019; Chetty et al., 2023). However, little effort has been devoted to understanding whether elite universities feed the pipeline of bureaucrats in the same way they do at top firms. This gap in research is primarily due to two main challenges that I address in this work: first, the lack of exogenous variation in access to higher education institutions, and second, the absence of detailed information on public servants' outcomes.

In this paper, I causally estimate the effect of elite university enrollment on the likelihood of working in the public administration and having a high-ranking position. For this, I use administrative information from Chile's centralized university application process. The characteristics of this system allow me to overcome the identification problems arising from selection. Notably, admission relies solely on standardized test scores, enabling a clear identification strategy, a regression discontinuity (RD) design, to estimate the causal effect of enrolling into an elite university. In particular, prospect students take a set of standardized tests and rank up to their preferred ten major *and* institution combinations in a centralized platform.[1] The system generates an accepted list and a waiting list of applicants each year for each major-institution combination. I take advantage of the fact that the acceptance cutoff scores in each of the major-institution combinations cannot be perfectly predicted, so marginally accepted and marginally waitlisted applicants (conditional on their entry exam scores) are comparable, allowing the implementation of an RD design strategy.

I define elite universities as the country's top two most historically academically selective institutions. Further, I *stack* specific groups of these major-university RD's to estimate the local average treatment effect (LATE) of enrollment (instrumented by acceptance) in an elite university, compared to a non-elite university, on the likelihood of working in the public sector and having a top position. The richness of the data allows me to observe all the major-institution options ranked by the applicants, which I use to define the comparison group unequivocally in each of the analyses. Additionally, the fact that applicants rank majors *and* institution combinations provides the opportunity to estimate the difference in outcomes of elite and non-elite graduates within majors, narrowing the comparisons and allowing the effect to vary by majors groups.

I define public sector top positions as all managers and high-rank professionals, which represent the top 5% of university applicants in public administration. To classify them, I leverage detailed administrative data on the Chilean public sector workforce. This dataset comprehends information on the universe of public servants under the executive branch of the Chilean government from 2018 to 2023. It includes key information regarding the position's classification (government authority, managerial, professional, technical, administrative, and auxiliary) and its place in the salary scale.[2] These characteristics allow for the classification of public sector positions by levels of responsibility and relevance.

[1] As opposed to the US case, Chilean students apply directly to a specific major within a specific institution.

[2] Analogous to the General Schedule of the U.S. Civil Service.

Importantly, a disproportionate rate of elite university graduates among managers and high-ranked professionals in the public sector is also documented in this sample. Between 2000 and 2017, less than 13% of the students accepted into a university did so in an elite university. This proportion doubles when we consider individuals who held a top position in the public sector between 2018 and 2023.

I find that enrolling in an elite university compared to a non-elite university, on average, reduces by 9% the likelihood of working in the public sector. A result in line with the documented wage compression in the public sector labor market (Hoxby and Leigh, 2004). Gender plays a significant role in explaining these results, as enrolling in an elite university shows a considerably larger and statistically significant impact among women. Also, the negative effect is concentrated on older individuals who graduated from voucher high schools outside the central region, Santiago.

On the other hand, admission to an elite university, on average, does not affect the likelihood of reaching a high-rank position in public administration. This means that the observed over-representation of elite university graduates among top positions in the public sector is a product of selection.

Elite universities in Chile generally offer a more comprehensive range of majors compared to non-elite universities. I identify the most prevalent majors in top positions to facilitate a more accurate comparison and better understand the distinct impact of elite education for specific groups. Then, implementing the same fuzzy stacked RD design methodology, I compare the probability of having a top position in the public sector between individuals enrolled in these majors at an elite university and individuals with similar preferences in the same majors but at non-elite universities.

For the most prevalent majors among top positions, enrolling in an elite university does not show noticeable effects on the likelihood of reaching top positions in public administration relative to the same major in a non-elite university. Nevertheless, for health (non-medicine) majors and for public administration, the effect of enrolling in an elite university on attaining a top position in the public sector is negative for high SES graduates and positive for graduates of lower SES. For architecture, sociology, and journalism, enrolling in an elite university reduces the probability of securing a manager or high-rank professional position in public administration for individuals from Santiago.

These results are particularly relevant, considering that the public sector plays a fundamental role in most economies. It is generally the largest employer in the labor market[3] and a major driver of social development (Finan et al., 2017). Understanding how elite university graduates select into the public sector and the returns to those qualifications in its labor market is highly relevant for public administration's representation. Higher-ranking positions in the public sector offer access to influential roles that can shape government policies and services. Under hiring policies that consider applicants' qualifications, elite higher education can help ensure equitable access to leading positions, which is critical to promoting a more representative government of the population it serves.

This paper makes several contributions to the existing literature. First, it expands the literature on estimating the causal effect of attending an elite higher education institution on labor outcomes, most of which has focused on contexts where the private sector labor market predominates. Findings show positive effects on earnings (MacLeod et al., 2017; Anelli, 2020; Jia and Li, 2021), as well as some null and mixed results (Dale and Krueger, 2002; Hoekstra, 2009; Mountjoy and Hickman, 2021). In contrast, job assignment process and career advancement decisions in the public sector are usually made in a political context, which can substantially differ from a market-driven environment in the private sector and is likely to affect the returns to elite higher education. This work contributes to this literature by studying returns to elite universities in a different context, the public sector.

Moreover, elite universities has shown a relevant role in the formation of leaders and attaining influential positions. The estimated results show that more selective institutions

[3]Roughly 15% of the total workforce in the US, from which more than 61% of occupations require postsecondary education, compared to 35 of private sector employment (BLS, May 2020).

do not seem to increase overall earnings after graduation, but they do increase the likelihood of reaching top positions at prominent firms and belonging to the top percentile of the earnings distribution (Zimmerman, 2019; Chetty et al., 2023). Notably, some of these results are only true for specific groups, such as males from affluent backgrounds. One of the contributions of this paper is to study the effect of elite universities on the likelihood of reaching a different type of leadership position. The Chilean civil service personnel classification and the salary pay scale help rank positions by relevance and level of responsibility, which I use to define a top position within the public sector administration.

Additionally, while quasi-experimental variation from admission cutoffs has been previously used to study the effect of elite institutions (Hoekstra, 2009; Abdulkadiroğlu et al., 2014; Zimmerman, 2019), in this paper, I take advantage of the richness of the applications' data to explicitly define the counterfactual groups in each of my RD analyses. This methodological improvement has not been previously implemented by preceding literature on elite education, and it allows a more precise interpretation of the estimated causal effects.

The public sector faces important barriers to attract and retain skilled workers (Borjas, 2002), but despite being governed by more stringent labor regulations, there are some resources that have shown being effective to attract talented candidates and improve management in the public sector. For example, 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 (Dal Bó et al., 2013; Finan et al., 2017; Ashraf et al., 2020; Muralidharan and Singh, 2020; Muñoz and Prem, 2022). This study extends this existing body of literature by examining the impact of elite universities on the propensity of individuals from different groups of majors to work in the public sector. This offers a unique perspective on the challenges of attracting diverse individuals to the public sector. For example, the results suggest that, on average, it would be more challenging to attract to the public sector individuals from elite universities if they are not from high SES or outside Santiago.

The study of the public sector has commonly been limited because of the lack of data covering the entire public administration. As a result, previous research has often been constrained to specific job types or institutions or considered only local government settings. This paper extends the scope of understanding the public sector labor market by leveraging comprehensive data encompassing all entities under the Chilean government, with the exclusion limited to institutions within the legislative and judicial branches.

The rest of the paper proceeds as follows. Section 2 provides more information about the Chilean public sector and the higher education application system. Section 3 describes the data and estimation samples. Section 4 describes the empirical methodology. Section 5 presents the RD design validation, the main findings, and the results for specific groups of majors. Section 6 concludes.

2 Study Context and Setting

2.1 The Chilean Public Sector

In this study, I use the information on public sector workers under the Chilean executive power in all centralized and decentralized agencies of the 24 existing ministries from 2018 to 2023. Specifically, the outcomes considered are having worked in the public sector and the likelihood of reaching a top position in 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 has an ascending structure of positions and remuneration grades linked to the importance of the function performed. A salary scale determines the remuneration structure,[4] and other general and specific allowances complement the base

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

salary.

Civil servants may have two types of contracts: *planta* (staff) and *contrata*, which respectively represent 55% and 22% of the personnel.[5] 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.

Within staff positions, there are career officials and trusted servants. For the former group, entry is obtained through a public competition,[6] 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 have the executive's exclusive confidence,[7] and are subject to the free appointment and removal by the President or of the corresponding authority. Before the creation of the SADP (for *Sistema de Alta Dirección Pública*, or Public Senior Management System) in 2003, these 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[8] 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 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

[5]There is another type of contract, *honorarios*, which represent 10% of the personnel but are not considered public servants (DIPRES, 2023).

[6]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.

[7]Ministers, Undersecretaries, and Head Chiefs of Service.

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

officials that can be hired as staff members, which cannot exceed 20%.

Considering this employment structure, my first labor msrket outcome is defined as ever having been a public employee. This indicator variable takes value 1 if the individual had a contrata or a planta contract between January 2018 and May 2023, and 0 otherwise.

On the other hand, to define the second labor outcome, ”having a top position,” it is key to consider that my analytical sample consists of individuals from the higher education application processes of 2000 onward. Therefore, a substantial proportion (90%) falls within the 25 to 45 age group in 2023. As higher-ranking positions are predominantly held by individuals with extensive experience, this demographic limitation restricts my capacity to observe part of the top positions in the analytical sample. Thus, I employ a *relative* measure of top position to address this constraint.

The public sector workforce comprises distinct roles categorized into five types: manager, professional, administrative, technician, and auxiliary. By considering the top positions, the focus inherently falls on those with significant responsibilities and leadership roles, primarily managers and some professionals.

To refine this criterion, I used the public sector salary scale, encompassing 31 grades. I included only professionals at the top 8 positions in the salary scale, constituting the uppermost 15% of the professional hierarchy. The result is a top position definition that only includes managers and some high-rank professionals, and which represents 5% of public sector positions in the analytical sample. The measure is relative as it doesn't necessarily comprehend all the directive and high-ranking professionals in the public sector, but those who applied to the university from 2000 onward. Appendix Figure A.1 highlights the categories considered as top positions among public servants.

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 further analyze elite universities' effect 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. Only these universities have the right to direct contributions from the state. All the CRUCH universities and six other large private institutions participate in the national centralized university admission system. Appendix Table A.1 lists all universities included.

Students willing to study in any of these 36 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 Spanish. In addition, depending on the requirements of their preferred majors 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 major.

Each year, after receiving their PSU results, students apply through a simultaneous, centralized, and integer system.[9] In this process, applicants list their preferred set of 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), 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

[9]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.

different PSU subject exams and the high school GPA. Therefore, the weighted score used to apply to any major is a composite of different PSU subject exams and the average high school GPA.

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.

Students are only accepted to their highest-ranked major-institution combination listed, conditional on their specific weighted PSU score reaching that year's corresponding admission threshold.

The institution's and majors' levels of selectivity vary significantly. The two oldest universities *Universidad de Chile* (UCH) and *Pontificia Universidad Católica de Chile* (PUC) are also the most selective. All the majors' admission cutoffs in these two institutions are considerably higher than in other universities, and the average difference is more than a standard deviation of PSU's score distribution. Therefore, the average PSU score of the typical accepted student in UCH or PUC is much higher relative to other applicants.

Both institutions also share the first and second place among Chilean universities in international classifications.[10] Also, Elite university graduates typically obtain better labor outcomes than their counterparts from less selective institutions. To illustrate, these two universities hold 95% of The National Prize[11] winners, and the two Chilean Nobel Laureates. Also, 70% of all presidents have earned degrees from one of these prestigious institutions. Between 1990 and 2016, two-thirds of government ministers, half the senators, and a third part of representatives were alumni of elite majors (UNDP, 2017). Similarly, 2% of students admitted to business-focused majors at these two universities account for 41% of directors and top managers in publicly traded corporations (Zimmer-

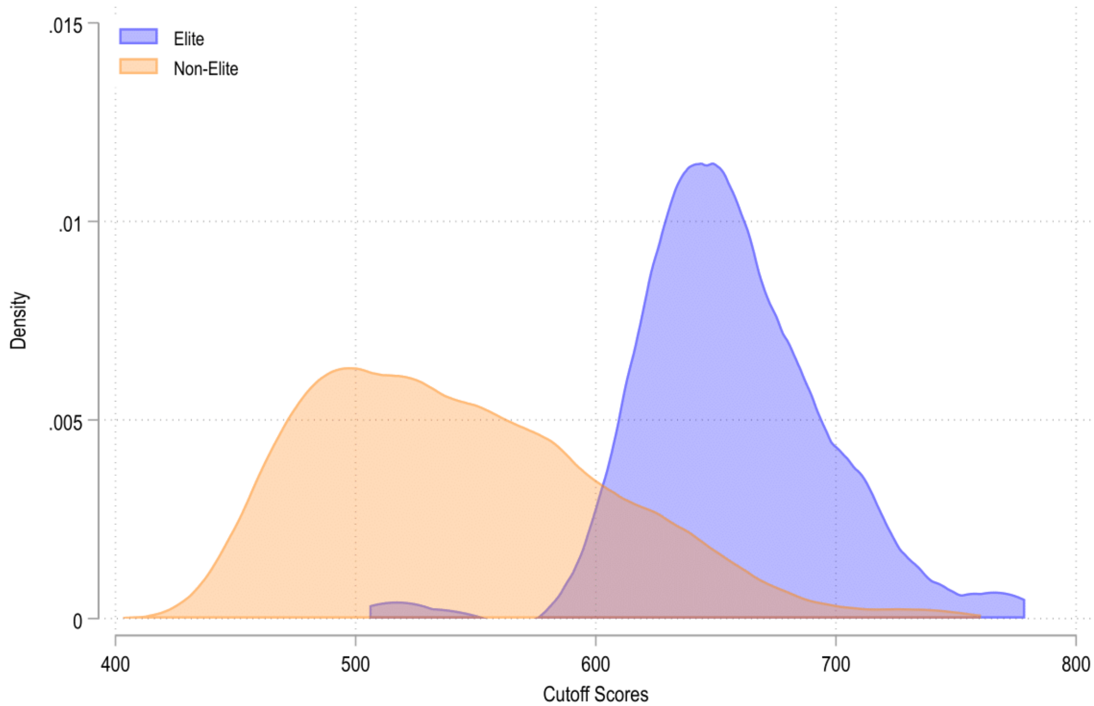
[10] QS World University Rankings, Times Higher Education World University Rankings, Academic Ranking of World Universities.

[11] The National Prize of Chile is the collective name given to a set of awards granted by the government of Chile. Categories include Literature, Natural Sciences, Social Sciences, and Arts, among others.

man, 2019).

For this large difference in selectivity and their graduates' outcomes, I define UCH and PUC as *elite* universities. Figure 1 shows the distribution of majors' average (through 2000 and 2017) admission cutoffs by type of institution, and Table 1 shows descriptive statistics of elite and non-elite universities. Importantly, on average, elite universities offer more majors, have more students, and accept a much larger proportion of students from private high schools and the Metropolitan region (Santiago).

Figure 1: Distribution of majors' Cutoffs by University Type



Notes: Average (2000-2017) admission cutoff for each major. Elite universities are the two most selective institutions in the country (UCH and PUC).

Table 1: Universities' Characteristics by Type

	Elite Universities (N = 2)	non-Elite Universities (N = 34)
Public university	0.50	0.47
N majors offered	44	36
N students accepted (year avg.)	3,407	1,861
Proportion total students accepted	0.065	0.032
Proportion students enrolled after acceptance	0.88	0.70
Major cutoff score	660.5	551.8
Proportion accepted students female	0.56	0.54
Proportion accepted students from private HS	0.56	0.18
Proportion accepted students from voucher HS	0.25	0.52
Proportion accepted students from public HS	0.18	0.30
Age of accepted student	18.7	19.0
Proportion accepted students from Metrop. region	0.78	0.33
N preferences listed in application by accepted student	4.5	5.1
Per capita family income (2018 CLP)	286,024	163,373

Notes: Elite universities are the two most selective institutions in the country (UCH and PUC). Data from 2000 to 2017 applications collapsed at the institution level.

3 Data and Sample

I use administrative data from different sources to track individuals who applied to university, from high school to their post-college employment outcomes in the public sector. The data can be classified into two types. The first is information on the labor market outcomes of individuals hired by the public sector in Chile, and the second comprises detailed characteristics of college-admission test takers and their application results.

3.1 Public Sector Data

The public sector data comprises all public servants in Chile from January 2018 to May 2023, spanning two governments from different political coalitions.[12] This is public information available since 2009 when the *Ley de Transparencia* (Transparence Law) came into effect. I restricted my sample to a nearer period because entries before 2018 are incomplete.

The dataset contains monthly registries of all individuals working in the public sector under the President's executive power (i.e., in any institution of the 24 existing ministries). The information considers only the civil personnel, excluding the personnel of the Armed Forces and Law Enforcement, as well as the personnel of public companies, deputies and senators of the National Congress, and members of the judiciary.

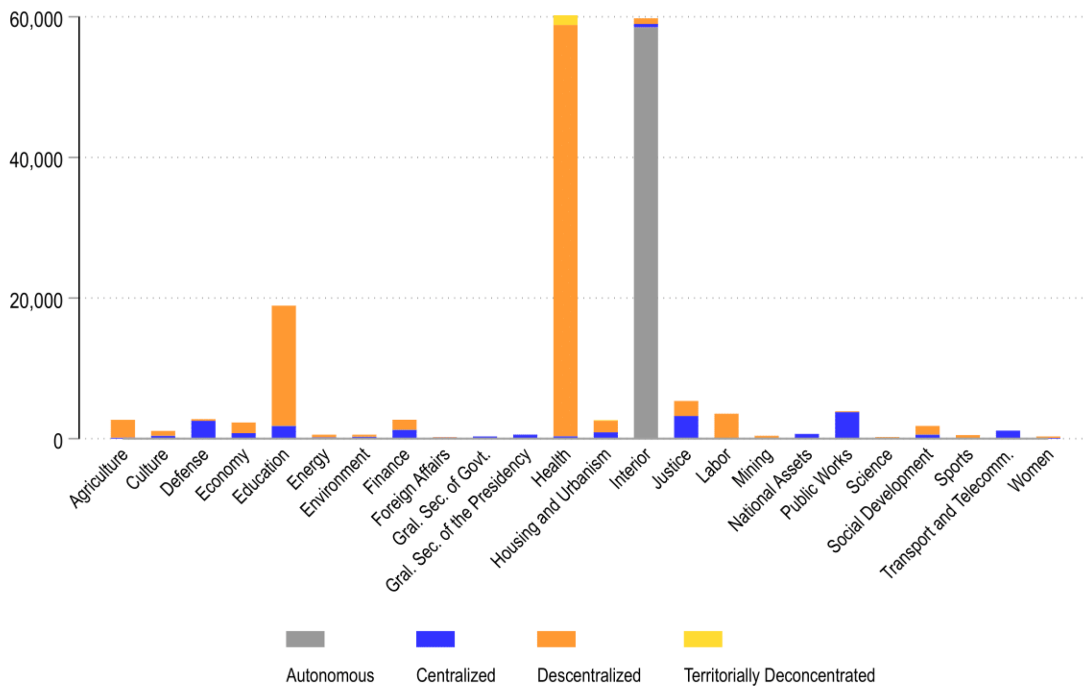
The information includes individuals' complete names, type of contract, earnings, institution, position type (i.e., government authority, managerial, professional, administrative, technical, or auxiliary), position on the salary scale, region, and more. Importantly, the dataset does not contain the individuals' national identification number, but I merged

[12] Sebastián Piñera's second government (March 2018 to March 2022) and Gabriel Boric's first year of government (March 2022 to May 2023).

it by name[13] using the 2016 Chilean electoral roll.[14]

Figure 2 shows the distribution of the annual average of the total number of public servants by ministry. It should be noted that the institutions of three ministries, Health, Education, and Interior, together employ 4 out of every 5 public servants. The large number of employees in the Ministry of the Interior is explained by all municipal workers. Although the municipalities are autonomous organizations, they are under the Ministry of the Interior. The large number of employees in Health and Education is because the state, as in many countries, is the largest provider of services in those markets.

Figure 2: Public Servants by Ministry



Notes: Average (2018-2022) number of public servants per ministry. Year 2023 not included as only observed until May. Public servants comprehend planta (staff) and contrata (temporary) contracts.

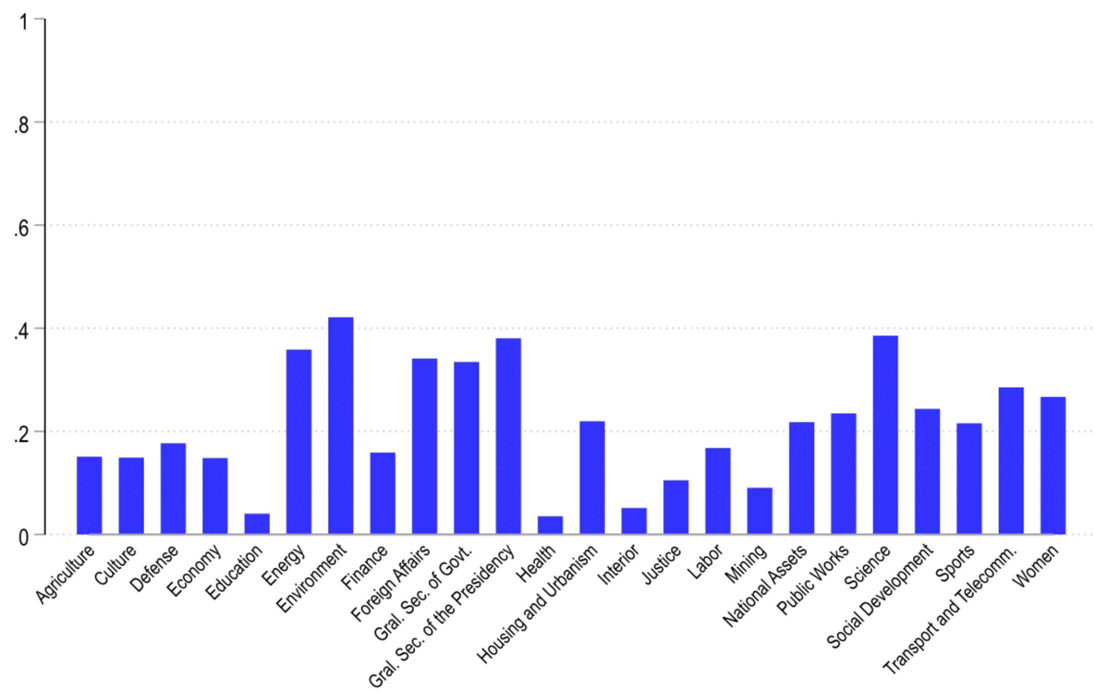
[13]Using first name, middle name, first surname, and second surname. The rate of successful matches is 93%.

[14]Chile's Electoral Service (SERVEL) makes public the electoral registry under the Law Nº18.556. It contains the names, identification number, voting locations, and other information of all Chileans over 17 years of age and foreigners with the right to vote.

Similarly, Figure 3 shows the annual average proportion of individuals with top positions within each ministry. Notably, despite the disproportionate number of public servants concentrated in the ministries of Health, Education, and Interior, the distribution of top positions' proportions is much more homogeneous. In fact, the larger ministries have, in general, a lower proportion of top positions.

In Figure 3, the annual average proportion of individuals holding top positions within each ministry is shown. Not surprisingly, because of the significant concentration of public servants in the Health, Education, and Interior ministries, the proportion of top positions there is remarkably lower. The mean proportion of top positions by ministry is 22%, notably higher than the overall proportion of top positions in the analytical sample. The difference relies on the fact that the analytical sample only includes a subsample of individuals who applied to higher education from 2000 onward.

Figure 3: Proportion of Top Positions by Ministry



Notes: Average (2018-2022) proportion of top positions per ministry. Year 2023 not included as only observed until May. The top positions are defined as all directive positions, and the professionals at the top 8 places, out of 31, in the salary scale (i.e., top 15% of professionals).

3.2 Applications Data

For the higher education information, I use administrative data from all yearly college application processes in Chile from 2000 onward. The anonymized information was provided for research purposes by the Ministry of Education (MINEDUC) and the Department of Evaluation, Measurement, and Educational Registration (DEMRE).

Each year, applicants rank a maximum of ten major-university combinations according to their preferences. The data is at the application level, and it includes the ranked preference number (1 to 10) and applications' results (i.e., accepted, waitlisted, or rejected). The data also contains applicants' characteristics such as higher education entry exam scores, high school GPA, the school from which they graduated, gender, and date of birth. A survey completed by applicants at college entry exam's online registration provides other applicants' baseline characteristics, such as per capita family income and parents' occupation, among others. Additionally, individuals' enrollment status after admission is available for all majors and each application year.

3.3 Sample

To combine the applications dataset with the public sector labor outcomes, the MINEDUC anonymized the public sector information by removing names and replacing the individuals' national identification numbers with a student-unique code that allows the combination of different educational datasets in Chile, preventing individuals from being identified. I collapsed the anonymized public sector data to the public servant level, so the labor outcomes indicate whether the individual ever worked in the public sector or reached a top position between January 2018 and May 2023.

I defined the outcome *top position* using the categories established in public administration. The existing position types, and their corresponding share in 2022 (DIPRES, 2023), are manager (2.4%), professional (50.3%), technician (25.6%), administrative and auxiliary (21.8%). Another category included in the data is government authorities (e.g., ministers). They hold political positions that are not subject to standard hiring protocols; instead, they are appointed at the discretion of the President. For this difference, I do not classify government authorities as top positions. Their inclusion does not change the estimated results due to the limited number of individuals in this category.

Only managers and some professionals, which are the following two top categories by earnings and responsibilities, are considered top positions. Only professionals at the top 8 positions (out of 31) in the salary scale are considered top positions. This is the top 15% of professionals. Together, the proportion of applicants reaching a top position represents 5% of individuals in the public sector data. Importantly, the top position indicator variable is coded as zero for individuals not observed in the public sector.

Finally, I merged these outcomes to the 2000-2017 applications data using individuals' masked identification numbers. The result is a higher education applications-level sample, for admission processes between 2000 and 2017, including individuals' post-college public sector labor outcomes observed between 2018 and 2023. This limits my capacity to observe older individuals in the public sector, as the typical applicant in 2000 would have 42 years in 2023. Nevertheless, the largest proportion of public servants is between 35-44 years of age (32%), while 28% is under 35 (DIPRES, 2023).

Table 2 shows descriptive statistics of the analytical (merged) sample. There are roughly 1,400,000 applicants in all the 18 higher education application processes—13.8% worked in the Chilean public sector between 2018 and 2023. The average number of applicants per year is around 80,000, and the mean number of major-university combinations ranked is roughly 5. Almost 70% of applicants are accepted into any institution, while less than 9% are admitted into an elite university (PUC or UCH).

While few differences exist among those who worked in the public sector and those who didn't, three stand out. Gender is balanced among applicants who didn't work in the public sector, but more than two-thirds of those who became public servants are women.

Of those who worked in the public sector, fewer graduated from private high schools and more from public high schools, showing a baseline socioeconomic difference in favor of those who didn't work in the public sector,[15] corroborated by a higher per capita family income. Finally, applicants who worked in the public sector graduated in less proportion from high schools in the Metropolitan Region (Santiago).

Regarding top positions, they are much more likely to have been accepted in any university, and importantly, the proportion of accepted in an elite university more than doubles compared to the rest of the applicants. Notably, while the proportion of female employees in top positions is balanced with males, it is 17 percentage points lower relative to all applicants in the public sector. Top positions also come, on average, from better socioeconomic backgrounds.

[15]Private schools in Chile cover less tan 10% the total enrollment. They have historically served individuals from wealthier families, so it is usually used as a good proxy of socioeconomic status (e.g., Zimmerman, 2019).

Table 2: Analytical Sample

	All Applicants		
	Not in Public Sector	Public Sector	Top Positions
Panel A: Applicants' characteristics			
N options ranked in application	4.8	5.0	4.9
Accepted in any university	0.69	0.68	0.79
Accepted in elite university	0.09	0.08	0.21
Female	0.50	0.67	0.49
Age	32.2	33.5	37.5
Graduated HS in Metrop. region	0.38	0.27	0.42
From private HS	0.19	0.14	0.27
From voucher HS	0.51	0.50	0.42
From public HS	0.29	0.36	0.30
Per capita family income (2018 CLP)	169,808	150,771	216,413
Panel B: Positions' characteristics			
Monthly avg. earnings (2018 CLP)	-	1,253,747	2,527,635
In Metrop. region	-	0.30	0.59
N Applicants	1,188,791	190,374	9,452

Notes: All individuals who applied to the university between 2000 and 2017, matched with public sector labor outcomes from 2018 to 2023. Only considered the first application process of each individual. The top positions are defined as all directive positions, and the professionals at the top 8 places, out of 31, in the salary scale (i.e., top 15% of professionals).

As detailed in the next section, the empirical strategy I use to estimate the effect of enrolling in an elite university on public sector labor outcomes restricts the analytical sample for identification purposes. Specifically, this estimation sample comprises the subgroup of applicants accepted into an elite university major, but whose next preferred option listed where they would have been admitted is a non-elite university. Similarly, it includes applicants who were waitlisted in an elite university and were accepted in a less preferred option in a non-elite institution. The estimation sample also considers a smaller group of applicants to increase statistical power. Those who, conversely, were accepted or waitlisted in a non-elite university major, and their next preferred option for which their score meets the corresponding cutoff (i.e., would have been or were accepted respectively) is in an elite university. This estimation sample allows the comparison between individuals with similar preferences who enrolled in an elite university with those who were admitted into a non-elite university.

The first column in Table 3 shows descriptive statistics of the estimation sample, considering all majors offered. The sample includes more than 180,000 applicants, from which a third are accepted in an elite university (at the right of the centered cutoff), and the other two-thirds are accepted in a non-elite university (at the left of the centered cutoff). The proportion of individuals from private high schools and from the Metropolitan region doubles compared to the total of applicants, and 0.9% have a top position.

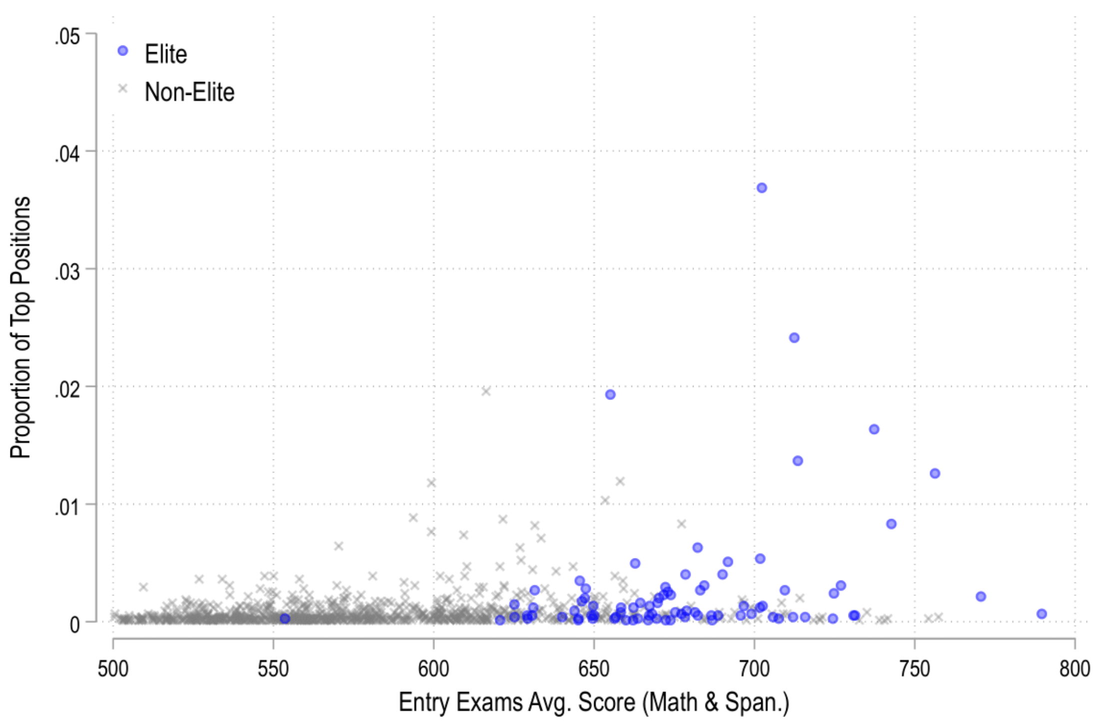
Table 3: Estimation Subsamples

	All Majors	Law, Business, Engineering	Health (non-Medicine)	Architecture, Sociology, Journalism	Public Admin.
Proportion accepted in elite univ.	0.32	0.34	0.22	0.37	0.37
Proportion accepted in non-elite univ.	0.68	0.66	0.78	0.63	0.63
Female	0.52	0.35	0.75	0.57	0.53
Private HS	0.39	0.52	0.31	0.44	0.13
Metrop. Region (Santiago)	0.70	0.69	0.68	0.66	0.73
Top position	0.009	0.010	0.005	0.013	0.059
N applicants	183,806	60,695	25,790	11,040	2,547

Notes: Each column corresponds to the subsample used to estimate the effect of enrolling in an elite relative to a non-elite university for the set of majors in each column title. Only considered individuals accepted in an elite university (and would have been accepted in a non-elite university otherwise) or waitlisted in an elite university (and accepted in a non-elite university) in the corresponding set of majors. Also considered a smaller group of individuals accepted in a non-elite university (and would have been accepted in an elite university otherwise) or waitlisted in a non-elite university (and accepted in an elite university) in the corresponding set of majors.

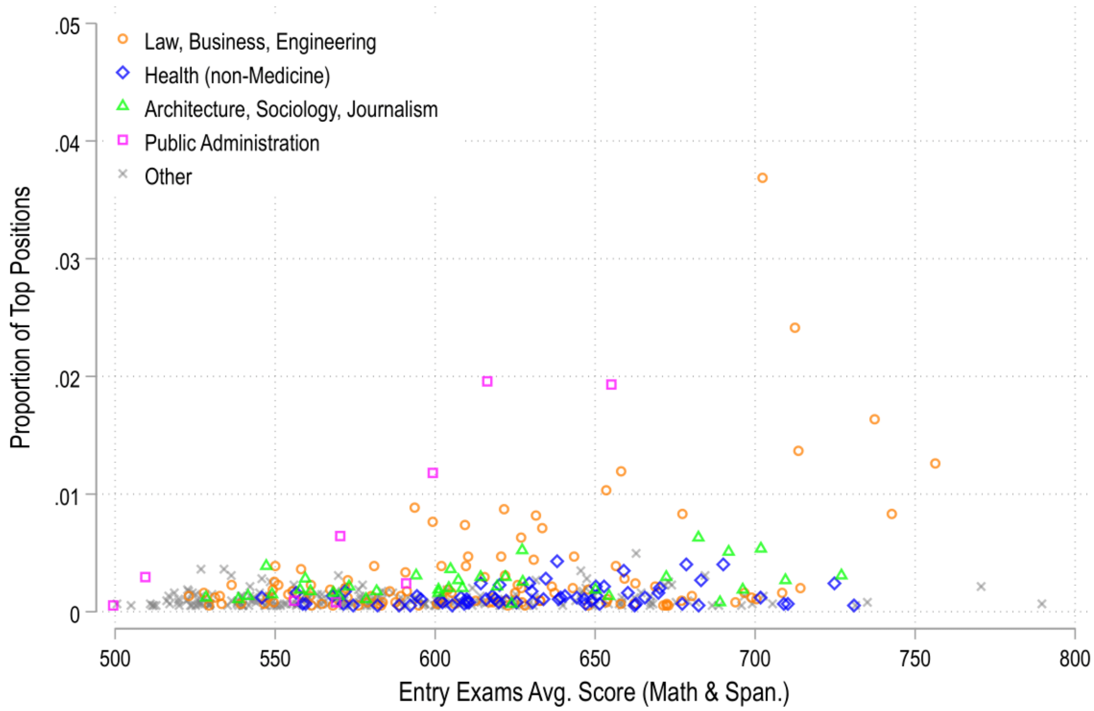
In the second part of my empirical analyses, I explore the most prevalent majors among top positions. Figure 4 shows the relationship between the major's selectivity and the proportion they represent among top positions. While there is significant variation, the plot shows a positive correlation between majors' selectivity and the proportion of top positions. Also, majors in elite universities, relative to non-elite majors, are distributed considerably to the top right part of the plot. They are more selective and seem to have a relatively higher proportion among top positions. Similarly, Figure 5 shows the same plot, omitting majors with none of their accepted individuals among top positions, but highlighting four groups of majors (independently of university type) that have a higher representation in top positions.

Figure 4: Majors' Selectivity and Proportion of Top Positions
Elite and Non-Elite



Notes: Estimation sample of all majors in an elite university relative to a non-elite university. Elite universities are the two most selective institutions in the country (UCH and PUC). Each mark represents the average entry exam score of the accepted applicants in each major between 2000 and 2017, and the share of top positions from that major.

Figure 5: Majors' Selectivity and Proportion of Top Positions
Groups of Majors



Notes: Estimation sample of all majors in an elite university relative to a non-elite university. Each mark represents the average entry exam score of the accepted applicants in each major between 2000 and 2017, and the share of top positions from that major. The top positions are defined as all directive positions, and the professionals at the top 8 places, out of 31, in the salary scale (i.e., top 15% of professionals). Omitted majors with a proportion among top positions ≤ 0.0005 (0.05%).

The most prevalent groups of majors among top positions are law, business, and engineering, the denominated "business-oriented" majors, and also the most prevalent among top positions in the private sector (Zimmerman, 2019). The second group comprises health majors, excluding medicine.[16] I excluded medicine as this major is very different from the rest of health degrees, as it is by far the most selective major, and their graduates have much higher earnings. Importantly, results do not vary if I include medicine in health majors. The third largest presence in top positions is for architecture, sociology, and journalism, while public administration, a major specifically designed to

[16]Health majors include: nursing, physical therapy, dentistry, psychology, obstetrics, chemistry and pharmacy, occupational therapy, medical technology, and nutrition.

manage the public sector, is in the fourth place.

I estimate the effect of enrollment in an elite university relative to a non-elite university separately for each one of the four sets of majors. This implies the definition of four new estimation samples, using the same process followed for the overall estimates. The only difference is further restricting the sample to individuals accepted and waitlisted in any of the majors in each of the four specified groups. In these cases, applicants at the right of the centered cutoff are admitted into a major of one of the four selected sets of majors in an elite university, while those at the left are accepted into a major from the same set, but in a non-elite university.

The last four columns in Table 3 show descriptive statistics for each of the major groups' estimation subsamples. There are large differences in gender and socioeconomic composition of applicants between the four groups of majors. Notably, top positions represent 1% of individuals in the law, business, and engineering sample and the architecture, sociology, and journalism sample. The group of majors with the lower rate of top positions is health (non-medicine), with 0.5%. The group with the largest proportion is the public administration major, with roughly 6%.

4 Research Design

4.1 Stacked Fuzzy RD

The goal of the research design is to estimate the LATE of enrolling in an elite university relative to a non-elite university, for those in the margin of admission, on the likelihood of working in the public sector and of reaching a high-rank position. The greatest challenge to causally estimate the effect of elite higher education on labor outcomes is overcoming the selection problem. Universities choose among their applicants, and students decide which universities and majors to apply. Consequently, the accepted and non-accepted applicants differ in observable and non-observable characteristics. These differences will also likely determine their post-college labor outcomes. Therefore, a simple comparison between the two groups will produce biased estimates of the elite higher education effect.

The Chilean higher education admission system offers a unique opportunity to address this challenge. By the end of each year, those willing to apply to the university must take standardized national exams, *Prueba de Selección Universitaria* (PSU).[17] The only requirement to take the tests is having graduated from high school. Math and Spanish subject exams are mandatory, while History and Sciences exams are optional. Applicants decide which tests they take according to the requirements of the majors they are willing to apply. The weights w^s assigned to the average high school GPA and each subject exam s, vary by major m, university u, and cohort c. Importantly, weights meet the conditions:

i. $\sum_s w^s_{muc} = 1 \,, \qquad \forall\, m, u, c.$

ii. $0 \leq w^s < 1 \,, \qquad \forall\, s = \textit{Math, Spanish, History, Sciences, GPA}.$

As a result, applicants have a specific weighted PSU score to apply for each major and institution of interest. Individual's i weighted PSU score to apply for major m, in university u, in cohort c, is defined as:

$$PSU_{imuc} = \sum_s w^s_{muc} \cdot \textit{score}^s_{ic} \,, \tag{1}$$

where $\textit{score}^s_{ic}$ is the average high school GPA[18] and the results in each PSU subject exam.

After receiving the PSU exam results, applicants rank their ten most preferred major and institution combinations in a centralized online platform. A deferred acceptance algorithm (Gale and Shapley, 1962) matches students and majors considering the ranked preferences. Applicants are admitted only into their most preferred major-institution combination listed, conditional on their weighted PSU score meeting the corresponding

[17] Before 2004's application process, the exams were named Prueba de Aptitud Académica (PAA).

[18] In Chile, GPA ranges from 1.0 to 7.0. For the higher education applications context, it is transformed to an equivalent PSU score.

cutoff. All other less preferred options listed are discarded. Each year, this process generates an accepted and a waitlist of applicants for each major-institution combination. In a second round, after enrollment, seats that weren't taken make way for waiting lists to move and fill empty slots. Prospective students may retake the entry exams and apply in more than one year, so I only use information from individuals' first application process in my analyses.

Importantly, applicants can't precisely predict the minimum score needed to be admitted to each major. Cutoffs vary in every admission process depending on the available slots for each major in each institution and the corresponding applicants' demand. Consequently, conditional on students' weighted PSU score, falling just above or below a cutoff is considered random, allowing a local comparison at the cut-point neighborhood as observable and non-observable characteristics are balanced between the two groups. In this way, every year, the admission system generates thousands of discontinuities on the probability of acceptance into the corresponding majors.

This quasi-experimental variation on admission allows the implementation of multiple RDs, each corresponding to a specific major and institution combination, with the weighted PSU scores as the running variables (Hastings et al., 2013). Apart from the mentioned discontinuity on the treatment assignment at the threshold, the RD identification relies on the assumption of continuity of potential outcomes at the cutoff. While this assumption is not directly testable, it has testable implications. To validate the RD design, I assess the plausibility of the potential outcomes continuity assumption by implementing the procedure in Cattaneo et al. (2018) to check for a discontinuity of the running variable's density, which would be a sign of manipulation of the running variable (e.g., increasing effort) to fall just above the threshold. A second testable implication of potential outcomes continuity is the balance of observable pre-treatment characteristics between individuals at each side of the threshold. To check this, I estimate the effect of admission on baseline variables. Statistically significant effects on pre-treatment outcomes are a sign of potential outcomes discontinuity.

The empirical strategy goal is to estimate the effect of elite universities on public sector labor outcomes. To do this, I implement a *stacked* RD approach following Pop-Eleches and Urquiola (2013), and Abdulkadiroğlu et al. (2014). Specifically, the empirical strategy pools the set of accepted and waitlisted individuals across all majors of the two most selective universities (PUC and UCH), centering the major-institution-specific cutoffs.

A new running variable is generated by subtracting the specific major cutoff from applicants' weighted PSU scores, and it represents the distance to the corresponding cutoff ($r_{imuc} = PSU_{imuc} - cutoff_{muc}$). The estimated equation is:

$$Y_{imuc} = f(r_{imuc}) + \beta D_{imuc} + \gamma_{muc} + \varepsilon_{imuc} \ , \tag{2}$$

where Y_{imuc} are the labor outcomes of individual i applying to major m, in university u, in application cohort c; $f(\cdot)$ is a smooth function and D_{imuc} is an indicator variable that takes value 1 if the student's weighted PSU score is higher or equal to the major-specific cutoff (and therefore admitted to major m in an elite university u) and 0 otherwise. Importantly, this stacked specification includes major-institution-cohort fixed effects, γ_{muc}, as the level of exogenous variation allowing identification is at the major-specific RD level. The estimated parameter β in this stack represents a weighted average of major-university LATE of admission in an elite university on the corresponding outcome Y_{imuc}.

As mentioned, the treatment assignment in the RD design is as good as random conditional on observables. For this reason, the running variable is included in the estimation equation for identification purposes. Depending on the relationship between the outcome and the running variable, the function $f(\cdot)$ can be a polynomial of grade 1, or higher in case of a non-linear relationship. Also, to allow for different slopes at each side of the cutoff, an interaction of the polynomial with the indicator variable can be included. However, choosing an incorrect functional form leads to bias (Gelman and Imbens, 2019), so the literature has usually favored the use of non-parametric local linear regressions (Hahn et al., 2001). Therefore, all results presented are local polynomial RD estimates with optimal bandwidths and robust bias-corrected confidence intervals (Calonico et al., 2014a; Calonico et al., 2014b; Calonico et al., 2020). Finally, while not considered in equation (2), other pre-treatment covariates are included in the specification to increase estimates' precision.

In this stack, meeting the specific criteria set at the centered cutoff point results in admission to an elite university major. However, a significant challenge frequently faced by the empirical literature in similar settings is the capacity to define the comparison group properly. Applicants waitlisted in a major in an elite university might end up admitted into a non-elite university, or in a different major of an elite university, or none.

Following Aguirre et al. (2022), I explicitly define the treatment and comparison groups by restricting the sample of applications considered in my analyses. The richness of the data allows me to observe all preferences ranked by the applicants in each year's admission process. Using this information, I consider (i) individuals who were accepted in an elite university major, but whose next preferred option meeting the corresponding cutoff is in a non-elite university (i.e., would have been accepted in a non-elite university); and (ii) individuals who got waitlisted in an elite university major, but whose next preferred option meeting the corresponding cutoff was in a non-elite university (i.e., accepted in a non-elite university). In this setting, the first group of applicants is at the right of the centered cutoff for elite admission, while those from the second group are at the left.

The result is a defined comparison between applicants with similar preferences, but one group is marginally accepted in an elite university (and would have been accepted in a non-elite university otherwise), while their counterfactuals are marginally rejected from an elite university, and accepted in a non-elite university.

To increase statistical power, I also include a smaller group of (iii) individuals who were accepted in a non-elite university major, but whose next preferred option meeting the corresponding cutoff is in an elite university (i.e., would have been accepted in an elite university); and (iv) individuals who got waitlisted in a non-elite university major, but whose next preferred option meeting the corresponding cutoff was in an elite university (i.e., accepted in an elite university). For this smaller group, the running variable is inverted ($r_{imuc} = \mathit{cutoff}_{muc} - PSU_{imuc}$), so those accepted in a non-elite university are at the left of the centered cutoff and those accepted in an elite university are at the right. Importantly, results do not vary when I remove this group from the analyses.

Naturally, not all admitted applicants enroll in the major where they are accepted. Therefore, I instrument student enrollment with acceptance into the corresponding major to estimate the local average treatment effect (LATE) of enrollment for the group of compliers[19] near the cutoff point using a fuzzy RD. This requires the instrumental variable (admission) to be exogenous, relevant, and monotonic. The exogeneity of the instrument is not testable, but the validity of the RD design supports it, as falling just above or below the threshold is random conditional on the running variable. The relevance (strength) of the instrument is directly tested by estimating the effect of admission on enrollment in an elite university in the first stage. The monotonicity assumption in this setting is expected to hold as the presence of defiers seems unlikely. Applicants can't enroll without being admitted, and the rate of enrollment is extremely high after admission.

The stacked fuzzy RD first- and second-stage estimation equations, respectively, are:

$$\mathit{enroll}_{imuc} = f(r_{imuc}) + \alpha A_{imuc} + \gamma_{muc} + \epsilon_{imuc}\,, \tag{3}$$

$$Y_{imuc} = f(r_{imuc}) + \delta \widehat{\mathit{enroll}}_{imuc} + \gamma_{muc} + \mu_{imuc}\,. \tag{4}$$

The variable A_{imuc} indicates admission into a major in an elite university (i.e., $0 \leq r_{imuc}$), and enroll_{imuc} for enrollment in that major. The parameter δ captures the LATE of enrollment in an elite university (vs. a non-elite university) for compliers near the centered

[19]Those who enroll if accepted.

cutoffs.

In stacked RD contexts, it is common to cluster the standard errors at the individual level because applicants can be in more than one of the multiple stacked RDs. In this setting, I only consider in my analyses individuals in groups (i) to (iv), which do not overlap. Then, as individuals appear only once in my sample, heteroskedasticity robust standard errors are presented in all estimates.

In my second set of analyses, I explore the effect of enrollment in an elite university for the set of majors with higher prevalence among top positions in the public sector: a) Law, business, and engineering; b) Health non-medicine; c) Architecture, sociology, and journalism; and d) Public administration. For that, in each case, I further restrict my estimation sample to those specific groups of majors. The comparison, therefore, is between individuals accepted in the same majors, but in an elite university relative to a non-elite university. Estimation subsamples for groups (i) to (iv) are redefined accordingly.

Finally, for all the fuzzy stacked RD models, I implement local polynomial RD estimators with robust bias-corrected confidence intervals and MSE-optimal bandwidth selector by Calonico et al. (2014b). All results tables report heteroskedasticity robust standard errors.

4.2 RD Assumptions Validity

The identification assumption of the RD design to obtain unbiased estimates requires the expected value of the potential outcomes to be continuous on the running variable at the threshold. In other words, the potential outcomes' distribution 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 (r_{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, the RD design will provide valid (comparable) treatment and control groups at each side of the threshold, as the treatment assignment is as good as random (conditional on observables) near the cutoff.

The assumption would be violated if, for example, applicants can sort themselves at the right of the cutoff to get admitted to an elite university. 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 applicants into the treatment group. Consequently, factors that could determine future earnings (as motivation) would not be continuous at the cutoff.

The assumption cannot be tested directly, but the standard is to check for two implications of the assumption violation. The first is looking for discontinuities of other predetermined observable characteristics and assessing the balance between the two groups at each side of the cutoff. The second approach examines the distribution density of applicants close to the cutoff point (McCrary, 2008). This selective sorting of applicants is unlikely to happen in the admission to higher education context because students do not know ex-ante the precise cutoffs (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., 2018). 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 A.2 shows no 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.[20]

Further, I also examine applicants' baseline characteristics' continuity. For this purpose, I estimate equation (3) with applicants' characteristics as dependent variables. Figure A.3 shows the estimated coefficient ($\hat{\alpha}$) for each case. None of the estimated coefficients are statistically different from zero at 95% confidence. 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.

I further explored the effect of elite relative to non-elite universities on the probability of having a top position for a selected group of majors. This requires generating new stacked RD estimation samples for each of the four groups of majors. Therefore, I also ran balance tests for applicants' baseline characteristics and manipulation tests for each case.

Appendix Figure A.4 shows the distribution of applicants near the corresponding cutoffs. The respective four formal tests can't reject the null hypothesis of no manipulation at 10% significance, providing evidence of no manipulation of the running variable. Similarly, Appendix Figure A.5 shows the estimated effects of admission to an elite university on ten applicants' baseline characteristics for each of the four major groups. From the 40 estimated coefficients, only two are statistically different from zero, a result that is expected by chance at 95% confidence. Again, these results provide evidence in favor of the assumptions of the stacked RD design.

5 Results

5.1 Main Results

In this section, I present overall findings of admission to an elite university irrespective of the major, starting with the negative impact on the likelihood of being employed in the public sector and moving on to the effect on attaining top positions. All the estimated

[20] P-value = 0.59

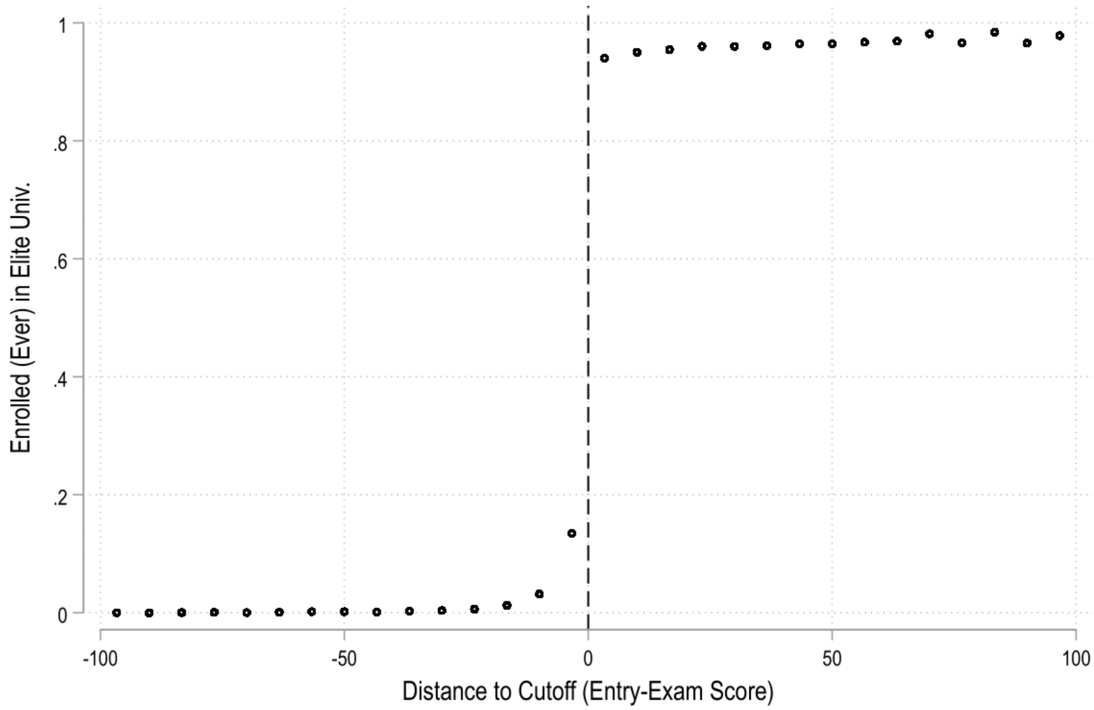
results presented are the LATE for compliers (applicants who enroll in an elite university if admitted) near the corresponding cutoff.

5.1.1 First-Stage

Figure 6 depicts the change in the probability of enrolling in an elite university when applicants fall at the right of the centered cutoff (i.e., admitted into an elite university instead of a non-elite university). At the centered threshold, there is a significant increase in the likelihood of enrolling in an elite university. As shown in the first column of Table A.2, there is an increase of 67 percentage points on the likelihood of enrolling in an elite university, corroborating the relevance of the admission variable as an instrument for enrollment.

The slight increase in the probability of enrollment in an elite university just at the left of the centered cutoff is because not all accepted applicants enroll in the first stage of the application process, and the wait lists of the specific majors move individuals to the group of accepted students in the second round.

Figure 6: Admission on Enrollment



Notes: Estimation sample of all majors in an elite university relative to a non-elite university. Applications processes from 2000 to 2017. At the right of the centered threshold are applicants accepted into any major in an elite university (and would have been accepted or were waitlisted in a major in a non-elite university), and at the left, are applicants who were accepted into any major in a non-elite university (and were waitlisted or would have been accepted into a major in an elite university).

5.1.2 2nd-Stage: Work in Public Sector

The fuzzy RD second stage estimated results presented in the top panel of Table 4 show that enrolling in an elite university has a negative and statistically significant effect of about 1.4 percentage points on the probability of working in the public sector. This effect represents a 9% decrease over the control group's mean of 15%. These findings show that individuals enrolled in elite universities are later less likely to pursue careers in the public sector.

As diplomas from elite universities have higher returns in the labor market (Hastings et al., 2013; Zimmerman, 2019), these negative results on the probability of working in the public sector aligns with the wage compression documented in the public sector (Hoxby and Leigh, 2004; Mizala et al., 2011). Irrespective of whether an elite university diploma serves as a signal of higher ability or a genuine surge in productivity, the outcome remains the same: the private sector rewards graduates from selective universities with better wages. Consequently, there exists a financial motivation to avoid the public sector for this group.

In the second and third columns of Table 4, I present separate estimates of the effect of enrolling in an elite university relative to a non-elite university for male and female applicants respectively. The estimated effect for male applicants is close to zero and not statistically significant, while for female applicants the effect is negative and much larger, 2.4 percentage points, representing a decrease of 13% on the likelihood of working in the public sector.

Table 4: Stacked Fuzzy RD Second-Stage Estimates

	Sample		
	Overall	Male	Female
Outcome: Public Sector			
Enrollment	-0.014*	-0.002	-0.024*
	(0.008)	(0.008)	(0.012)
Control Group Mean	0.150	0.120	0.178
Bandwidth	14.5	23.4	16.7
N	38,388	29,225	21,145
Outcome: Top Position			
Enrollment	-0.001	-0.002	0.001
	(0.003)	(0.003)	(0.005)
Control Group Mean	0.015	0.013	0.016
Bandwidth	12.5	25.9	14.2
N	33,526	31,779	18,264

Notes: Estimation sample of all majors in an elite university relative to a non-elite university. The enrollment variable is instrumented in a first stage with acceptance, and the reported coefficient is the estimated $\hat{\delta}$ parameter of equation (4) using local polynomial RD estimation with robust bias-corrected confidence intervals (Calonico et al., 2014a; Calonico et al., 2014b; Calonico et al., 2020). The model includes major-university-year fixed effects and baseline covariates controlling for HS GPA, number of applications listed, and indicators for gender, age, type of high school, region, and if any parent worked in public sector. Heteroskedasticity robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

To better understand the mechanisms behind these results, I further estimate heterogeneous effects by SES (proxied by the type of high school attended), geographical location, and age. Results in the top panel of Appendix Table A.3 show that the negative effect of enrolling in an elite relative to a non-elite university on the likelihood of working in the public sector is only significant for older applicants, of lower SES (non-private high school), and from outside the Metropolitan region (Santiago).

5.1.3 2nd-Stage: Top Position

I further explore the effect of enrolling in an elite university on the probability of attaining top positions in the public sector. Interestingly, the results at the bottom panel of Table 4 show a small but non-significant effect, meaning that enrolling in an elite university does not significantly affect the probability of attaining top positions in public administration.

When I examine the effects of enrolling in an elite university on the likelihood of reaching a top position in pubic administration by gender, the results reported in columns two and three of the bottom panel in Table 4 do not show important differences between male and female applicants, and again, the estimated coefficients are not statistically significant. Additionally, when I explore heterogeneous effects by SES, geographical location, and age, the estimated effects reported in the bottom panel of Appendix Table A.3 show non-significant effects on the probability of having a top position in the public administration.

5.1.4 Refined Sample Analysis: Excluding Extremes in Selectivity Majors

In these analyses, the comparison between elite and non-elite universities is made regardless of the major. Elite universities, on average, offer a larger number of majors relative to less selective universities (see Table 1).

To narrow the comparison and to check if the results are driven by extremely selective majors in elite universities or by very low selective majors in the control group, I reduced the estimation sample to majors with average entry exam cutoffs between 600 and 700 points. The decision to restrict the sample to those majors is based on what is observed in Figure 1, where the largest mass of overlapping majors is in the chosen range.

Appendix Table A.4 shows that results do not vary significantly for this overlapping set. The negative effect on the likelihood of working in the public sector for women and the null effect on attaining a top position seems to not be driven by majors at the tails of the selectivity distribution.

5.2 Results by Major

In the second part of my analysis, I delve into the probability of securing a top position, explicitly examining a selected group of majors. When considering all majors across elite and non-elite universities, there is a risk of overlooking unique major-related effects. Certain degrees are more adept at preparing individuals for high-ranking roles. To address this concern, I narrowed the scope by comparing outcomes within specific majors. This targeted approach enhances comparability by focusing on individuals accepted into the same majors, enabling a direct comparison between elite and less selective institutions. The goal is to understand whether elite universities have an impact on reaching a top position among the most prevalent majors in those jobs. Accordingly, I identified four groups that stand out. The first is the group of law, business, and engineering, the so-called business-focused majors (Zimmerman, 2019), which together represent 37% of top positions in the sample. The second group is health majors (excluding medicine), comprising 10% of top positions. Architecture, sociology, and journalism jointly accrue 9% of the top positions, while the public administration major alone represents 7% of the top positions in the analytical sample (see Figure 5).

The stacked RD design in each of the four cases is generated in the same way as in the first analysis but for the specific majors explored. Thus, at the right of the corresponding centered cutoffs are individuals who were randomly accepted (conditional on their weighted PSU score) in the selected major in an elite university, while individuals at the left were conditionally randomly accepted to the same major in a non-elite university.

The discontinuity in the probability of enrolling into an elite university after admission is shown in Appendix Figure A.6 for all four groups of majors. The first-stage estimated results range between 50 to 85 points increase in the likelihood of enrollment if admitted, validating the admission as an instrument for enrollment in all four cases.

Table A.5 presents the fuzzy RD second-stage estimates of the LATE of enrolling in an elite university for compliers, relative to a non-elite university among the four sets of selected majors. The overall estimated coefficients are not statistically significant, but differences in magnitude and sign appear between the four groups. Panel A shows a very small negative coefficient of 0.1 percentage points of enrollment in elite universities on the likelihood of having a top position among law, business, and engineering majors. Panels B and D show positive effects of 1.2 and 2.6 percentage points for health and for public administration majors, respectively. On the other hand, enrolling in an elite university reduces the likelihood of attaining a top position in architecture, sociology, and journalism by 1.7 percentage points.

The second and third columns in Table A.5 show estimated effects for the subsamples of male and female individuals, respectively. The only statistically significant effect is for males in architecture, sociology, and journalism, showing a reduction of 8 percentage points in the probability of having a high-rank position. Notably, except for the law, business, and engineering majors, the LATE of enrolling in an elite university on the probability of having a top position is relatively large for males.

Finally, I estimate heterogeneous effects on the likelihood of having a top position for the four groups of majors. While estimates are less precise, the first two columns of Appendix Table A.6 show that, in health and public administration majors, applicants from higher (lower) SES who enroll in an elite university are less (more) likely to reach a top position in the public sector, compared to their counterparts in non-elite universities. Columns 3 and 4 show that for architecture, sociology, and journalism, the effect of enrolling in an elite university varies by baseline geographical location. Applicants who graduated from high schools in the central region of the country are less likely to reach top positions relative to similar applicants from the same location who were accepted in the same major but in a non-elite university. The last two columns show that only for public administration, there are heterogeneous effects by age, as individuals older than 30 who enroll in an elite university are more likely to reach top positions.

6 Conclusion

In this paper, I study the impact of attending an elite university on public sector labor outcomes, using Chilean public administration and higher education admissions administrative data. The analysis revealed significant insights into the relationship between elite higher education and career trajectories within the state administration. By leveraging a rigorous stacked regression discontinuity design and using applicants' ranked options to compare individuals with similar preferences, I found that enrollment in an elite university, on average, reduces the likelihood of working in the public sector by 9% among marginally accepted and rejected applicants. Gender and high school backgrounds play crucial roles in shaping these outcomes. Interestingly, attending an elite university did not consistently affect the probability of reaching high-ranking positions across major groups, emphasizing the complexity of this relationship within the public sector context.

Although the study provides a thorough analysis, there are a few limitations to keep in mind. The age range of the sample, in part, limited the opportunity to study older individuals in the public sector's top positions. This suggests the potential for future research to delve into the career paths of more senior professionals, exploring their unique patterns of mobility and success within the public sector.

The gender disparities seem particularly relevant in this context, as in the private sector for business-focused majors (Zimmerman, 2019). The disproportionate impact of elite universities on women's career paths in the public sector suggests underlying systemic factors at play. One possible explanation could be the existence of implicit biases or gender-specific challenges within the workplace, influencing the career progression of female professionals differently from their male counterparts. Further investigation into the organizational dynamics and cultural factors within public administration could shed light on these disparities and offer valuable insights into devising targeted interventions.

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APPENDIX

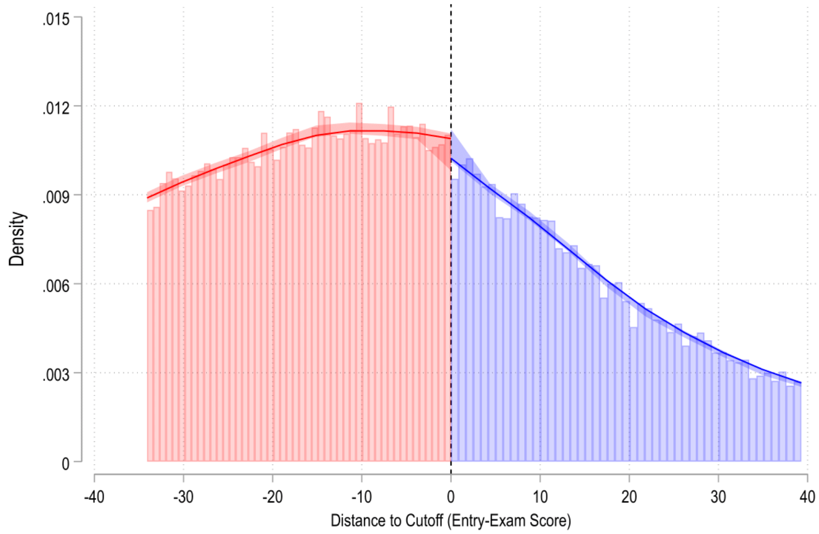
Figures

Figure A.1: Top Positions

Salary Scale	Govt. Authorities	Managers	Professionals	Technicians Administrative 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	3,334,590	***3,334,085***		
3	3,179,344	***3,178,335***		
4	3,032,770	***3,031,251***	***2,982,523***	
5	2,655,506	***2,693,437***	***2,568,712***	
6		***2,461,138***	***2,417,531***	
7		***2,232,668***	***2,207,538***	
8		***2,031,271***	***2,011,540***	
9		***1,846,890***	1,847,864	879,621
10		***1,694,189***	1,695,059	832,244
11		***1,556,775***	1,557,538	785,374
12		***1,430,593***	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	593,75
17			922,263	564,093
18			832,543	539,716
19			761,821	517,885
20			696,221	486,324
21			638,289	460,29
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				253,72
31				241,722

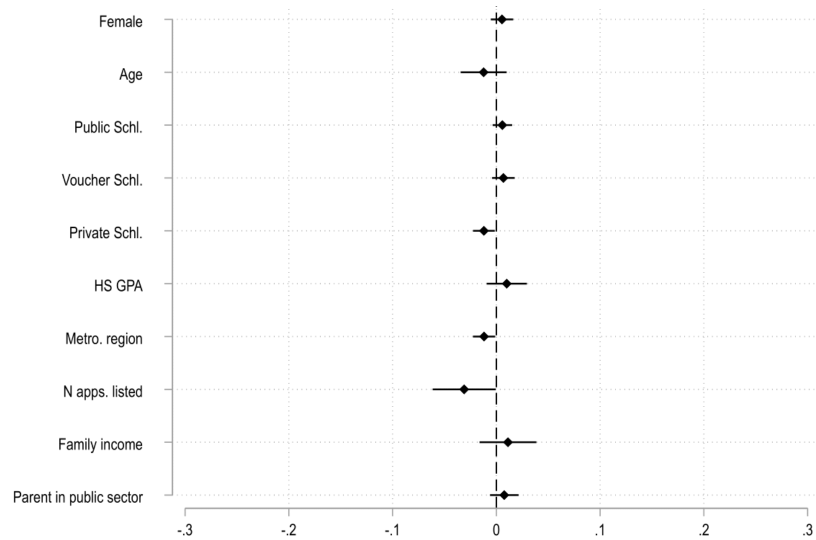
Notes: The values are a summary of the remunerations received by officials governed by the Single Salary Scale. Highlighted cells signal the positions considered as top positions in the public sector, all managers and the top-ranked professionals

Figure A.2: Manipulation Test



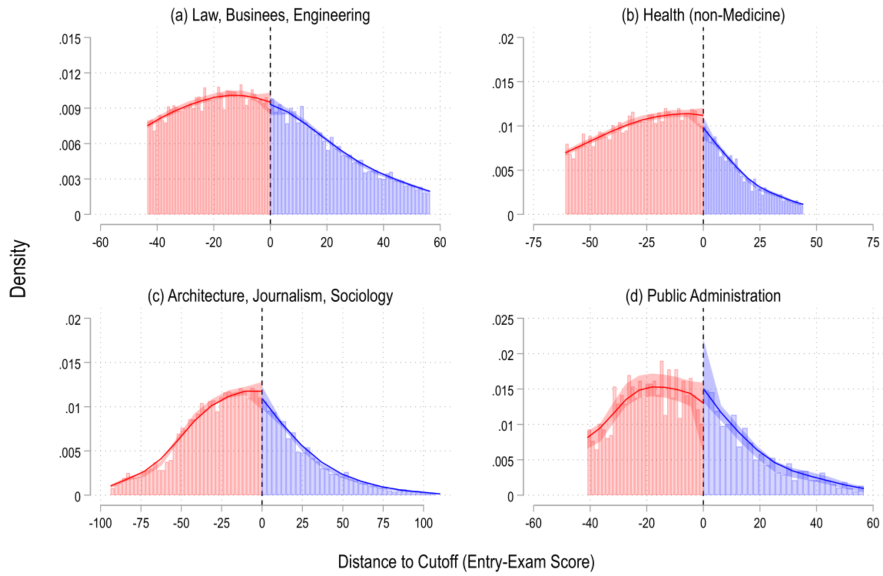
Notes: Manipulation test using local polynomial density estimation (Cattaneo et al., 2018). Estimation sample of all majors in an elite university relative to a non-elite university. Applications processes from 2000 to 2017. In blue, applicants accepted into any major in an elite university (and would have been accepted or were waitlisted in the same major in a non-elite university). In red, applicants who were accepted into any major in a non-elite university (and were waitlisted or would have been accepted into the same major in an elite university). The formal test doesn't reject the null hypothesis of no manipulation (P-value = 0.59).

Figure A.3: Continuity Covariates Test



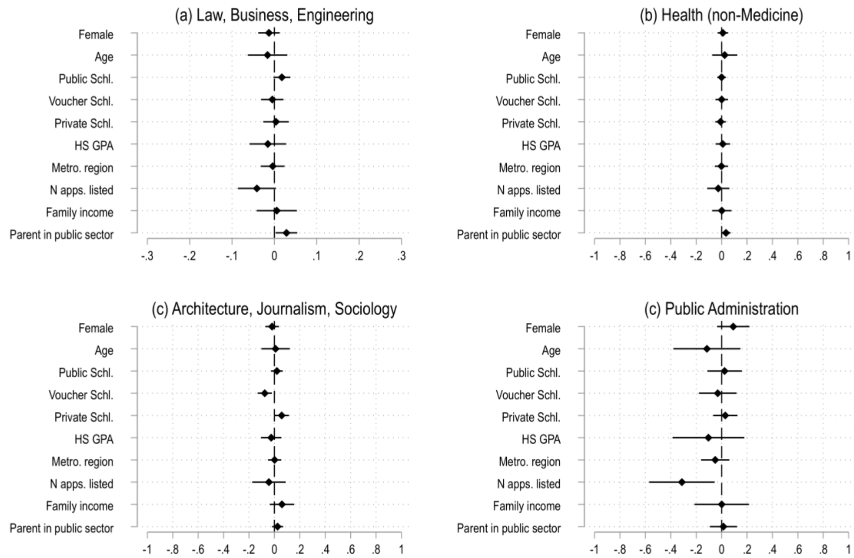
Notes: Estimation sample of all majors in an elite university relative to a non-elite university. Each point estimate represents the estimated coefficient on admission ($\hat{\alpha}$) from equation (3) using covariates in the vertical axis as outcomes and including major-institution-year fixed effects. Linear RD model allowing for different slopes at each side of the centered threshold, with MSE-optimal bandwidth selector (Calonico et al., 2014a; Calonico et al., 2014b). Heteroskedasticity robust standard errors and confidence intervals at 95% confidence level. Non-discrete variables (age, HS GPA, and number of applications listed) are standardized by application process year.

Figure A.4: Manipulation Test by Majors



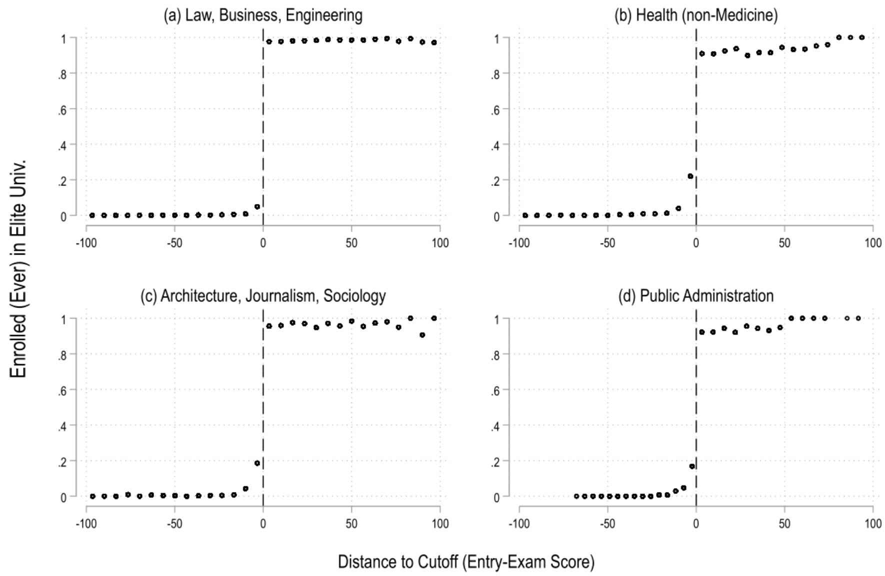
Notes: Manipulation test using local polynomial density estimation (Cattaneo et al., 2018). Estimation sample of each set of majors in an elite university relative to a non-elite university. Applications processes from 2000 to 2017. In blue, applicants accepted into the corresponding group of majors in an elite university (and would have been accepted or were waitlisted in the same major in a non-elite university). In red, applicants who were accepted into the corresponding group of majors in a non-elite university (and were waitlisted or would have been accepted into the same major in an elite university). The formal tests don't reject the null hypotheses of no manipulation at 95% confidence (P-value (a) = 0.73; P-value (b) = 0.28; P-value (c) = 0.89; P-value (d) = 0.06).

Figure A.5: Continuity Test by Majors



Notes: Estimation sample of each set of majors in an elite university relative to a non-elite university. Each point estimate represents the estimated coefficient on admission ($\hat{\alpha}$) from equation (3) using covariates in the vertical axis as outcomes and including major-institution-year fixed effects. Linear RDD model allowing for different slopes at each side of the centered threshold, with MSE-optimal bandwidth selector (Calonico et al., 2014b; Calonico et al., 2014d). Heteroskedasticity robust standard errors and confidence intervals at 95% confidence level. Non-discrete variables (age, HS GPA, and number of applications listed) are standardized by application process year.

Figure A.6: Admission on Enrollment by Majors



Notes: Estimation sample of each set of majors in an elite university relative to a non-elite university. Applications processes from 2000 to 2017. At the right of the centered threshold are applicants accepted into the corresponding group of majors in an elite university (and would have been accepted or were waitlisted in the same major in a non-elite university), and at the left, are applicants who were accepted into the corresponding group of majors in a non-elite university (and were waitlisted or would have been accepted into the same major in an elite university).

Tables

Table A.1: Universities

Institution Name	Public/Private	Traditional/Non-Traditional	Elite/Non-Elite	Metrop. Region/Other
Universidad de Chile	Public	Traditional (CRUCH)	Elite	Metrop. Region
Pontificia Universidad Católica de Chile	Private	Traditional (CRUCH)	Elite	Metrop. Region
Pontificia Universidad Católica de Valparaíso	Private	Traditional (CRUCH)	Non-Elite	Other Region
Universidad Austral de Chile	Private	Traditional (CRUCH)	Non-Elite	Other Region
Universidad Alberto Hurtado	Private	Traditional (CRUCH)	Non-Elite	Metrop. Region
Universidad de los Andes	Private	Traditional (CRUCH)	Non-Elite	Metrop. Region
Universidad de Antofagasta	Public	Traditional (CRUCH)	Non-Elite	Other Region
Universidad de Aysén	Public	Traditional (CRUCH)	Non-Elite	Other Region
Universidd del Bío-Bío	Public	Traditional (CRUCH)	Non-Elite	Other Region
Universidad Católica del Maule	Private	Traditional (CRUCH)	Non-Elite	Other Region
Universidad Católica del Norte	Private	Traditional (CRUCH)	Non-Elite	Other Region
Universidad Católica de la Santísima Concepción	Private	Traditional (CRUCH)	Non-Elite	Other Region
Universidad Católica de Temuco	Private	Traditional (CRUCH)	Non-Elite	Other Region
Universidad de Atacama	Public	Traditional (CRUCH)	Non-Elite	Other Region
Universidad de Concepción	Private	Traditional (CRUCH)	Non-Elite	Other Region
Universidad Diego Portales	Private	Traditional (CRUCH)	Non-Elite	Metrop. Region
Universidad de la Frontera	Public	Traditional (CRUCH)	Non-Elite	Other Region
Universidad de los Lagos	Public	Traditional (CRUCH)	Non-Elite	Other Region
Universidad de la Serena	Public	Traditional (CRUCH)	Non-Elite	Other Region
Universidad de Magallanes	Public	Traditional (CRUCH)	Non-Elite	Other Region
Universidad Metropolitana de Ciencias de la Educación	Public	Traditional (CRUCH)	Non-Elite	Metrop. Region
Universidad Arturo Prat	Public	Traditional (CRUCH)	Non-Elite	Other Region
Universidad de O'Higgins	Public	Traditional (CRUCH)	Non-Elite	Other Region
Universidad de Playa Ancha	Public	Traditional (CRUCH)	Non-Elite	Other Region
Universidad de Santiago	Public	Traditional (CRUCH)	Non-Elite	Metrop. Region
Universidad de Tarapacá	Public	Traditional (CRUCH)	Non-Elite	Other Region
Universidad de Talca	Public	Traditional (CRUCH)	Non-Elite	Other Region
Universidad Tecnológica Metropolitana	Public	Traditional (CRUCH)	Non-Elite	Metrop. Region
Universidad Técnica Federico Santa María	Private	Traditional (CRUCH)	Non-Elite	Other Region
Universidad de Valparaíso	Public	Traditional (CRUCH)	Non-Elite	Other Region
Universidad Adolfo Ibáñez	Private	Non-Traditional	Non-Elite	Metrop. Region
Universidad Católica Silva Henríquez	Private	Non-Traditional	Non-Elite	Metrop. Region
Universidad del Desarrollo	Private	Non-Traditional	Non-Elite	Metrop. Region
Universidad Finis Terrae	Private	Non-Traditional	Non-Elite	Metrop. Region
Universidad Mayor	Private	Non-Traditional	Non-Elite	Metrop. Region
Universidad Andrés Bello	Private	Non-Traditional	Non-Elite	Metrop. Region

Notes: The table includes all 36 universities considered in the sample. The geographical location is based on their main offices, as many institutions have campuses in more than one region in the country.

Table A.2: Stacked Fuzzy RD First-Stage Estimates

	Estimation Subsample				
	All Majors	Law, Business, Engineering	Health (non-Medicine)	Architecture, Sociology, Journalism	Public Admin.
Acceptance	0.665***	0.851***	0.498***	0.548***	0.610***
	(0.010)	(0.012)	(0.028)	(0.035)	(0.075)
Control Group Mean	0.142	0.007	0.028	0.029	0.024
Bandwidth	6.1	10.9	7.9	9.8	10.6
N	16,892	8,955	2,855	1,685	537

Notes: The estimation sample is restricted to set of majors named at the top of the corresponding column. The reported coefficient corresponds to the parameter $\hat{\alpha}$ in equation (3) using local polynomial RD estimation with robust bias-corrected confidence intervals in (Calonico et al., 2014a; Calonico et al., 2014b; Calonico et al., 2020). The model includes major-university-year fixed effects and baseline covariates controlling for HS GPA, number of applications listed, and indicators for gender, age, type of high school, region, and if any parent worked in public sector. Heteroskedasticity robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Table A.3: Stacked Fuzzy RD Second-Stage Estimates. Heterogeneous Effects

	Non-Private HS	Private HS	Non-Metrop. Region	Metrop. Region	Age ≤ 30	Age > 30
Outcome: Public Sector						
Enrollment	-0.032**	-0.002	-0.034**	-0.006	0.001	-0.022*
	(0.013)	(0.009)	(0.014)	(0.010)	(0.011)	(0.013)
Control Group Mean	0.170	0.118	0.195	0.130	0.100	0.190
Bandwidth	13.0	19.6	20.7	13.4	12.9	13.9
N	20,350	20,141	15,895	24,693	15,795	20,163
Outcome: Top Position						
Enrollment	0.002	-0.005	-0.002	-0.002	0.001	0.002
	(0.006)	(0.004)	(0.005)	(0.003)	(0.001)	(0.006)
Control Group Mean	0.016	0.012	0.015	0.015	0.001	0.025
Bandwidth	11.4	17.0	19.3	16.1	19.7	14.1
N	18,093	17,778	14,926	29,079	23,143	20,315

Notes: Each estimation subsample is restricted to the group in the corresponding column title. The enrollment variable is instrumented in a first stage with acceptance, and the reported coefficient is the estimated $\hat{\delta}$ parameter of equation (4) using local polynomial RD estimation with robust bias-corrected confidence intervals (Calonico et al., 2014a; Calonico et al., 2014b; Calonico et al., 2020). All models include major-university-year fixed effects and baseline covariates controlling for HS GPA, number of applications listed, and indicators for gender, age, type of high school, region, and if any parent worked in public sector. Heteroskedasticity robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table A.4: Stacked Fuzzy RD Second-Stage Estimates.
Overlapping Majors [600-700]

	Sample		
	Overall	Male	Female
Outcome: Public Sector			
Enrollment	-0.021**	-0.008	-0.021*
	(0.010)	(0.012)	(0.011)
Control Group Mean	0.143	0.109	0.171
Bandwidth	18.9	23.5	28.6
N	30,807	16,376	23,535
Outcome: Top Position			
Enrollment	-0.006	-0.004	-0.005
	(0.004)	(0.005)	(0.005)
Control Group Mean	0.018	0.02	0.018
Bandwidth	20.3	33.2	19.2
N	32,783	21,090	17,129

Notes: Estimation sample of all majors in an elite university relative to a non-elite university and only majors with cutoffs between 600 and 700 points. The enrollment variable is instrumented in a first stage with acceptance, and the reported coefficient is the estimated $\hat{\delta}$ parameter of equation (4) using local polynomial RD estimation with robust bias-corrected confidence intervals (Calonico et al., 2014a; Calonico et al., 2014b; Calonico et al., 2020). The model includes major-university-year fixed effects and baseline covariates controlling for HS GPA, number of applications listed, and indicators for gender, age, type of high school, region, and if any parent worked in public sector. Heteroskedasticity robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table A.5: Stacked Fuzzy RD Second-Stage Estimates by Majors

	Sample		
Outcome: Top Position	Overall	Male	Female
Panel A: Law, Business, Engineering			
Enrollment	-0.001	-0.000	-0.005
	(0.006)	(0.006)	(0.009)
Control Group Mean	0.012	0.010	0.016
Bandwidth	17.5	18.5	25.3
N	14,021	10,199	6,064
Panel B: Health (non-Medicine)			
Enrollment	0.012	0.014	0.001
	(0.007)	(0.014)	(0.008)
Control Group Mean	0.007	0.005	0.007
Bandwidth	16.1	10.9	19.7
N	5,404	957	4,761
Panel C: Architecture, Sociology, Journalism			
Enrollment	-0.017	-0.082**	-0.005
	(0.019)	(0.042)	(0.021)
Control Group Mean	0.017	0.018	0.017
Bandwidth	17.5	14.2	19.6
N	2,877	1,029	1,791
Panel D: Public Administration			
Enrollment	0.026	0.102	0.004
	(0.049)	(0.094)	(0.052)
Control Group Mean	0.072	0.081	0.064
Bandwidth	27.2	20.6	22.5
N	1,241	470	557

Notes: The enrollment variable is instrumented in a first stage with acceptance, and the reported coefficient is the estimated $\hat{\delta}$ parameter of equation (4) using local polynomial RD estimation with robust bias-corrected confidence intervals (Calonico et al., 2014a; Calonico et al., 2014b; Calonico et al., 2020). The model includes major-university-year fixed effects and baseline covariates controlling for HS GPA, number of applications listed, and indicators for gender, age, type of high school, region, and if any parent worked in public sector. Heteroskedasticity robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table A.6: Stacked Fuzzy RD Second-Stage Estimates. Heterogeneous Effects by Majors. Outcome: Top Position

	Non-Private HS	Private HS	Non-Metrop. Region	Metrop. Region	Age ≤ 30	Age > 30
Panel A: Law, Business, Engineering						
Enrollment	-0.008	-0.001	-0.004	-0.000	-0.001	-0.002
	(0.011)	(0.005)	(0.011)	(0.006)	(0.003)	(0.010)
Control Group Mean	0.013	0.011	0.017	0.010	0.001	0.023
Bandwidth	13.8	29.3	18.5	21.7	26.3	23.5
N	5,032	12,123	4,873	11,381	9,933	9,166
Panel B: Health (non-Medicine)						
Enrollment	0.024**	-0.016*	0.015	0.012	-0.001	0.021
	(0.010)	(0.009)	(0.012)	(0.009)	(0.002)	(0.017)
Control Group Mean	0.007	0.004	0.007	0.006	0.000	0.017
Bandwidth	15.7	13.5	15.0	10.9	16.0	20.7
N	3,535	1,543	1,872	2,396	3,009	2,949
Panel C: Architecture, Sociology, Journalism						
Enrollment	-0.014	-0.049	0.021	-0.052**	-0.004	-0.041
	(0.024)	(0.033)	(0.028)	(0.023)	(0.003)	(0.051)
Control Group Mean	0.022	0.011	0.020	0.016	0.002	0.031
Bandwidth	17.2	14.2	23.8	16.4	16.4	13.8
N	1,553	1,074	1,297	1,787	1,311	1,200
Panel D: Public Administration						
Enrollment	0.143**	-0.101	0.059	0.054	0.016	0.092
	(0.072)	(0.161)	(0.104)	(0.069)	(0.013)	(0.110)
Control Group Mean	0.073	0.067	0.046	0.081	0.007	0.117
Bandwidth	14.7	16.0	18.6	15.9	21.4	17.3
N	630	118	189	630	356	548

Notes: Each estimation subsample is restricted to the group in the corresponding column title. The enrollment variable is instrumented in a first stage with acceptance, and the reported coefficient is the estimated $\hat{\delta}$ parameter of equation (4) using local polynomial RD estimation with robust bias-corrected confidence intervals (Calonico et al., 2014a; Calonico et al., 2014b; Calonico et al., 2020). All models include major-university-year fixed effects and baseline covariates controlling for HS GPA, number of applications listed, and indicators for gender, age, type of high school, region, and if any parent worked in public sector. Heteroskedasticity robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10.