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The Value of College Names

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Improving college reputation can potentially impact both college choice and graduates' early labor market performance. We study how one common practice to improve college reputation – colleges changing their names to signal higher quality – affects these two outcomes. Using a large administrative dataset from China, we show that colleges who change their names attract more qualified applicants, with larger effects among applicants who have less information about the college. These impacts persist over time, suggesting that name changes have self-reinforcing effects. To understand how name changes impact college graduates' labor market performance, we conduct a resume audit study to estimate how listing a college's new (vs. old) name affects employers' recruitment decisions. We observe a small benefit for new college names in most jobs, but a penalty in jobs with low skill and experience requirements, which is consistent with employers responding rationally to how college name changes affect student aptitude.

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Abstract

Improving college reputation can potentially impact both college choice and graduates' early labor market performance. We study how one common practice to improve college reputation – colleges changing their names to signal higher quality – affects these two outcomes. Using a large administrative dataset from China, we show that colleges who change their names attract more qualified applicants, with larger effects among applicants who have less information about the college. These impacts persist over time, suggesting that name changes have self-reinforcing effects. To understand how name changes impact college graduates' labor market performance, we conduct a resume audit study to estimate how listing a college's new (vs. old) name affects employers' recruitment decisions. We observe a small benefit for new college names in most jobs, but a penalty in jobs with low skill and experience requirements, which is consistent with employers responding rationally to how college name changes affect student aptitude.

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1 Introduction

Many important dimensions of the quality of educational institutions are difficult to to observe, both for prospective students and employers (Andrabi et al., 2011; Deming et al., 2012, 2016; Abdulkadiroğlu et al., 2018). As a result, major decisions related to college – for example, both college choice and decisions about hiring college graduates – often hinge upon people's perception of a school's quality, i.e., its reputation (Hastings and Weinstein, 2008; MacLeod et al., 2017). In response to this, colleges frequently attempt to improve their reputation by changing visible aspects of the college. For example, many colleges spend large amounts of money advertising and trying to raise their place in national rankings (Winter, 2003; Alter and Reback, 2014; Newlon, 2014).

In this paper, we focus on one highly visible and discrete strategy to improve college reputation: the practice of a college changing its name to signal higher quality. This practice is surprisingly common across a wide variety of contexts. In the US, for example, more than 530 "mainstream" institutions have changed their name since 1996 (Clark, 2009).[1] In China, as we document, more than seven hundred institutions have changed their name since the 1990s.[2] A simple back-of-the-envelope calculation suggests that these name changes are likely to have affected the college choice and early labor market performance of tens of millions of college graduates in the last 20 years, and will affect tens of millions more in the years to come.[3]

Using administrative data from China and a large resume audit study, we estimate how these college name changes affect students' college choices and employers' subsequent recruitment of college graduates. We use the case of China because it is unique in the following aspects. First, China has the largest market of college students in the world[4] and hundreds of well-established

[1] Historically, several hundred more US colleges changed their name in this fashion between 1800 and 1950. For an excellent review of this phenomenon in the US context, see Platt et al. (2017).

[2] Similar name changes are common in other large markets for higher education, such as the UK (Line, 2018) and India (Raman, 2020; TNN, 2020).

[3] Using just the US and Chinese cases, we assume that there are 500 colleges per country who have changed their names in the last 20 years. Assuming each college takes in roughly 2,000 students per year, this means that the careers of 40 million students were affected by these name changes, over this period, in these two countries alone.

[4] In 2018, roughly 7.53 million students graduated with a BA from Chinese degree-granting colleges. In 2018 in the US, roughly 3.94 million students graduated with a BA. Source: https://www.statista.com/statistics/227272/number-of-university-graduates-in-china/, https://www.statista.com/statistics/185153/degrees-in-higher-education-earned-in-the-united-states/, accessed February 29, 2020.

colleges which changed their names in the last 20 years. Second, China has a unidimensional measure of applicant quality: the applicant's score on the annual college entrance exam. This provides us a unique opportunity to precisely estimate how college efforts to change their reputation affect whether they are able to attract higher quality applicants.

We show how college applicants respond to college name changes using difference-in-differences analysis on a large administrative dataset. This dataset contains average college entrance exam scores for the students enrolled in 95% of China's bachelor's degree-granting colleges, summarizing the scores of over 40 million applicants between 2006 and 2016, a period in which more than 200 colleges changed their names.[5] We focus only on institutions with permission to grant bachelor's degrees, excluding institutions that upgraded from primarily granting three-year degrees to granting four-year degrees. For the colleges in our sample, at the time these colleges officially changed their names, there was almost no change in the resources or offerings of the college.[6]

We find that college name changes are successful in attracting higher-scoring applicants, and that these gains persist in the years after the name change. The gains in test scores we measure are equivalent to an improvement of roughly 40 to 50 places in national rankings. We show that these effects are larger among students with less information about the college: first, we find that these gains are much larger among students applying from "out-of-state," i.e., applicants from a different province than that in which the college is located; second, we find that the effects are larger in the earlier part of our study period, when it was more difficult to obtain information on college quality because of less widespread internet access. Separately, we decompose the effects into absolute gains and gains relative to competitor colleges. We find that roughly 75% of these effects come from attracting students away from competitor colleges.

[5] Shi et al. (2020) use a smaller dataset (roughly 40% of the colleges we have) and a different analysis strategy to estimate how a subset of these name changes affect student quality, but do not investigate the questions of information, absolute vs. relative gain, and resources that we engage with here.

[6] In this way, the setting we study is similar to the study of college mergers in Russell (2019). It is also similar to Clinton (2020), who reports the effects of a state-mandated change of name from college to university for six colleges in Massachusetts, where no resources were allocated to help with the transition. That paper focuses on the labor market performance of students who had entered these colleges prior to the name change, but graduated afterwards, whereas ours focuses primarily on how name college changes affect college choice and graduates' subsequent labor market outcomes.

We then study how employer behavior responds to these changes. To do so, we conducted a large resume audit study, submitting over 14,000 resumes to employers across six large cities in China to estimate the premium to listing a college's new name, as opposed to its old one. We are thus changing only the college's name—both applicants will have attended the same college, but the way the college is listed varies across resumes. Overall, we find no detectable difference between callback rates for applicants listing a college's new name and similar applicants listing its old name.

The overall estimate masks important heterogeneity in callback behavior across job types. For jobs where companies face greater risk of hiring an overqualified applicant, we observe a penalty for listing a college's new name. The penalty is greater in jobs with lower experience or credential requirements, and greater for applicants from higher ranked colleges. This pattern is consistent with recent resume audit studies conducted in the US, China, and India, respectively (Deming et al., 2016; Chen, 2019; Sekhri, 2020). In each of these studies, the following stylized fact emerges: in lower pay or lower status jobs, HR professionals fear hiring overqualified applicants who might grow dissatisfied on the job and quit.[7] By contrast, we find that in jobs with higher requirements for technical skill or experience, applicants listing a college's new name are more likely to receive a callback, though this difference is not always statistically significant.

These patterns suggest that employers are aware of the difference in quality between students graduating with a new college name and those with an old name. To scrutinize this interpretation, we analyze data from a supplementary administrative data set of individual test-takers in the Chinese civil service exam and from a survey of human resource professionals. In the civil service exam data, we see that test-takers from a given college who graduated after the college changed its name score 0.02-0.07 SD better than applicants from the same college who graduated before the name change. While descriptive, this shows that, from the perspective of government hiring officials, college name changes are coincident with a slight increase in applicant quality. The survey

[7] In further support of this interpretation, we find a larger new name penalty within these jobs among smaller firms and jobs which pay lower salaries, cases in which mismatch may be relatively costly to the employer or in which high-qualified applicants are more likely to be dissatisfied, respectively.

of HR professionals reveals that those making hiring decisions are aware of college name changes, anticipate that these changes may attract better students, and think college name changes may help students in the labor market.

Our paper shows how efforts to boost school reputation affect applicants' choice of college, advancing the literature on information and school choice (c.f., Hastings and Weinstein 2008; Hoxby and Turner 2013, 2015; MacLeod and Urquiola 2015; Andrabi et al. 2017; Dillon and Smith 2017). The fact that these effects are greater among students with less information highlights the importance of school reputation in school choice settings with imperfect information. It also underscores the need for policy to address such information failures.

We estimate an important dimension of the relationship between college reputation and labor market outcomes. Specifically, we recover the difference in callback rates between two people with the same characteristics, including the same college, but listing different names for the college. This deviates from what is more commonly measured in previous work, the difference in callbacks across similar resumes listing different colleges (c.f., Dale and Krueger 2014; Darolia et al. 2015; Deming et al. 2016; Anelli 2020; Black et al. 2020).

Finally, we advance research on the value of names in markets with information frictions. People often use names to infer the characteristics of products and firms. A wide literature in economics has shown that the names of firms, products, and even people have large economic consequences (Tadelis, 1999; Bertrand and Mullainathan, 2004; McDevitt, 2014; Rubinstein and Brenner, 2014; Belenzon et al., 2017). We show how this phenomenon manifests in two important, interrelated markets for higher education, with applications in a wide range of contexts.

The paper proceeds as follows: Section 2 provides information on the setting we study. Section 3 describes our main empirical predictions. Section 4 presents our results on how efforts to change to college reputation affect college choice. Section 5 describes the experimental design of our resume audit study and reports our results on how efforts to change college reputation affect graduates' performance in the labor market. Section 6 concludes.

2 College name changes and college admissions in China

China has a large and vibrant system of college education. In 2019, it had 2,688 officially recognized post-secondary degree-granting institutions, 1,265 of which were permitted to grant bachelor's degrees. In this section, we describe the history and institutional details of college name changes in China and how this relates to applicants' college choice behavior.

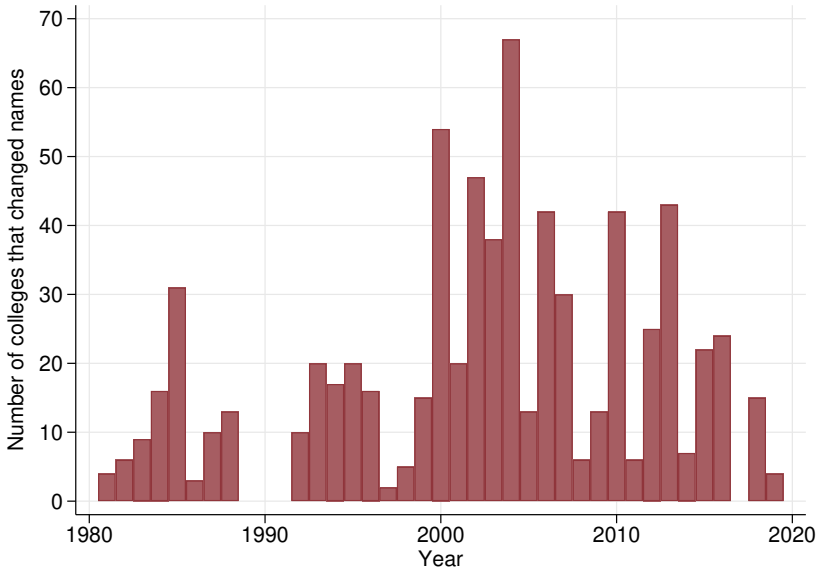
2.1 College name changes in China

China's most prestigious institutions, such as Peking University and Tsinghua University, were founded between the late 19th and early 20th centuries. Many colleges were founded later, in the period immediately after the founding of the People's Republic of China in 1949. When these schools were created, they were modeled on the Soviet example with the goal of training China's elite with specific skills related to production or leadership. They granted bachelor's, master's, and doctoral degrees across a wide variety of subjects, but were often named to emphasize their contribution to national economic productivity, such as the *Sichuan College of Science and Engineering*.[8] Many institutions initially called "college" or "institute" (in Chinese, *xueyuan*) were designed with the purpose of granting both undergraduate and graduate degrees. As a result, differentiation between the name "college" or "institute" (*xueyuan*) and the name "university" (in Chinese, *daxue*) is less informative about the offerings of the institution than it is in other contexts.

In the 1980s, as China was transitioning from a command to a market economy, the government redirected colleges to focus on training individuals to be productive members of the new economic system. With that transition came the beginning of the name changes we study in this paper. In Figure 1, we show a histogram with the number of name changes by year, from 1980 – when this phenomenon began – until today. There are 715 colleges which changed their names over this period, more than half of the 1,265 institutions permitted to grant bachelor's degrees. Many of

[8]Two additional periods of college founding took place: one in the 1980s, as part of China's reform and opening, and the other in the early 2000s, as part of China's broader college expansion. During this latter expansion period, China also permitted the establishment of private colleges to meet demand for tertiary education that was not fully met by expansion of slots at public colleges. These private colleges are widely regarded to be inferior to public ones.

Figure 1: College name changes in China from 1980-2019



Note: this figure shows a histogram of the number of colleges which changed their names in every year from 1980 to 2019. We collected college name change information from Baidu Baike (https://baike.baidu.com/), the largest Chinese-language, collaborative, web-based encyclopedia in the world, a website similar to Wikipedia. We then confirmed this information using information posted on colleges' official websites. The majority of the data we use in this study comes from the period spanning 2006-2016.

these name changes were likely initiated by college leaders in a bid to improve the quality of their applicants, partly as a way to further their own careers.[9]

In this paper, the name changes we focus on occurred between 2006 and 2016. We focus exclusively on institutions which were permitted to grant four year degrees over this period. We exclude from our analysis all institutions which upgraded during this period from primarily granting three-year degrees (*dazhuan*) to primarily granting four-year degrees.

Chinese colleges have to apply to the Ministry of Education (MOE) for permission to change their names. This process often takes several years, and it involves satisfying two sets of requirements.[10] The first set entails meeting minimum levels for the number of students, the quality of facilities of the college, and the number of subjects offered. The requirements in this first set are unlikely to be binding, as most colleges who change their names are already large, have large enrollments, and offer many subjects.[11] The second set entails meeting minimum levels for the qualifications of faculty, research productivity, and resources. These are more likely to be binding but, because evaluation is based on a school's performance in the previous five years, they are still manipulable.[12] Empirically, we can analyze how various college resources change at the time a college changes its name. We find that, in name-changing colleges, there is no statistically significant change in resources in the year in which name changes occur. We present these results in Appendix B.

[9]The leaders of Chinese public colleges – including both presidents and communist party secretaries – are appointed by the Ministry of Education or local provincial governments. Like civil servants, their promotion is evaluated based on their performance (Li and Zhou, 2005). A recent study of Chinese bureaucrats in education-related posts shows evidence of this type of career-motivated decision making and related behavior (Fang et al., 2020).

[10]Chinese college name changes did not confer any new distinction of degree-granting privilege. As mentioned previously, many institutions with the name "college" or "institute" conferred doctoral degrees throughout the period we study. At most, name changes may have increased the number of post-bachelor's degree options. This differs from the US, where state- and accreditation agency-specific regulations often stipulate that a post-secondary degree-granting institution calling itself a "university" must offer graduate studies, meet stricter accreditation requirements, or provide different resources. Nonetheless, many college name changes in the US also occur without substantial changes to facilities, offerings, or other characteristics (Finder, 2005; Platt et al., 2017; Wong, 2019; Clinton, 2020).

[11]We provide more details about these requirements in Appendix A.

[12]A recent piece by Jiachuan Chen, the president of Qilu University of Technology, documents that the school spent more than ten years working to change its name from Shandong College of Light Industry to its current name. During this time, the school took great efforts – such as setting up policies to reward external funding applications – to address the two most binding requirements: resources and research productivity. Source: https://zhuanlan.zhihu.com/p/50249046, accessed November 26, 2020.

To receive MOE approval to change its name, a college must meet all requirements prior to the annual application deadline, usually around October 1st. After an application is submitted, the MOE reviews the college's application materials and conducts site visits. The MOE issues decisions in the spring of the following year, and approved name changes occur in the months thereafter. Therefore, the full application process may take several years, spanning from when the college begins preparing its application materials – especially, ensuring their research productivity and resources meet the requirements – to the MOE making its ultimate decision. This setup means that in the year that a name change is first observable to college applicants, very little else about the college is likely to have changed, as we show empirically to be the case in Appendix B.[13]

There were multiple types of name change, which we summarize in Table 1. The most common was the switch from "college" (*xueyuan*) to "university" (*daxue*), as in type 1 in Table 1. Another common change increased the geographic scope, e.g., swapping out a city's name for that of a province, as was the case when the *Xuzhou Normal University* became the *Jiangsu Normal University* (type 2 in Table 1). Similarly, colleges could change the professed scope or focus of the college's specialization, as did the *Zhejiang College of Education* when it became the *Zhejiang College of International Studies* (type 3 in Table 1). These could also be combined, e.g., changing the geographic scope and changing from college (*xueyuan*) to university (*daxue*), as did *Zhuzhou College of Technology* when it became *Hunan University of Technology* – Zhuzhou being a city within Hunan province. This is classified as type 4 in Table 1.

As we will describe further in Section 4, the most common type of change – and the types that we focus on in our empirical work – are types 1 and 4. In Appendix C, we describe the similar phenomenon of college name changes in the US. Our study of these changes in China is distinct, but we argue that the similarities between name changes in the two contexts highlights the broad policy relevance of our analysis.

[13] Similarly, in a study of the price effects of college mergers in the US, Russell (2019) shows that very little changes about the college other than its name at the time of "official" merger. Rather, as in our case, any major changes to facilities, offerings, or teaching quality occur one or more years before the change is announced. Clinton (2020) shows similar patterns among six name-changing colleges in Massachusetts.

Table 1: Types of name change

Type	*Description*	*Name*	*Example*
1	Institute/college to university	Old	Shanghai College of Electric Power
		New	Shanghai University of Electric Power
2	Geographic scope	Old	Xuzhou Normal University
		New	Jiangsu Normal University
3	Industrial focus	Old	Zhejiang College of Education
		New	Zhejiang College of International Studies
4	Combinations	Old	Zhuzhou College of Technology
		New	Hunan University of Technology

Note: this figure provides and classifies examples of the different types of name changes that occurred among Chinese colleges over the period 1980-2019.

2.2 College admissions in China

In recent years, between 8 and 10 million Chinese high school students have taken the centralized college entrance examination annually with the goal of gaining admission to one of these colleges (Yu et al., 2012). China's system of allocating college applicants to colleges depends on three core factors: the student's score on the college entrance exam, the student's expressed preferences over colleges, and the quota from the national government which sets the number of total students from a given province, in a given track – science or humanities – that a college may admit. The college entrance exam occurs once each year. In it, all students are tested on core subjects (Chinese, math, and a foreign language) along with subjects specific to their track. Students take the exam and express their preferences over colleges.[14] The college admissions system matches students to colleges using a "parallel mechanism," described in detail in Chen and Kesten (2017). Students compete with other students from their province for slots in their high school track (Zhang, 2016; Jia and Li, 2020). Within each province, the highest-performing student on the college entrance exam in a given track is assigned to their preferred college. The second highest-performing student is then assigned to their preferred college, and so on, until each college's track-specific quota is

[14]The sequence of this varies somewhat across provinces and over time in our sample. Because we are comparing within years, within provinces, there is no variation in this sequence within each of the cells we analyze.

met. If a given college's slots are filled before the process gets to a student who has listed that college, the student's second preference is consulted, and so on.

Chinese high school students make college choices with imperfect information. As in the US, many dimensions of college quality are unobservable, and students receive only suggestive information about the likely admissions cutoffs for their current application cycle.[15] These students must rank their college preferences under this uncertainty. Bo et al. (2019) show that this leads to substantial mismatch of students to colleges, and that relieving one key information problem – revealing students' scores to them before students have to list their preferences – reduces the probability of mismatch by 18%. Loyalka et al. (2016) show that poor and rural students make what appear to be particularly sub-optimal choices, reflecting either limited knowledge of colleges far from their hometown or greater preference for staying close to home for college. College name changes, therefore, may have a particularly large effect on students with less information or ability to parse it.

We can further illuminate how students make decisions about college choice using a survey given to the entire entering class of students in the 2014-15 academic year in a large, anonymous college in the "211" classification. This survey asked respondents which factor most influenced their choice of college. Other than the student's college entrance exam score, which mechanically determines where a student can attend college, the school's reputation (*shengwang*) was the most common factor given, with 337 of the 2,611 students selecting this, or 30% of those who did not mention the college entrance exam score.[16]

[15] In a given year, the admissions cutoff for a given school depends on the demand for that school. The minimum admissions score for a given applicant province-college-track cell varies from year to year: the mean year-on-year change of this cutoff is 5 points (out of 750) and the standard deviation of this change is 30 points (Jia and Li, 2020)

[16] In both this survey, and another commonly used survey of college students in various colleges administered in 2009 (the *daxuesheng chengzhang zhuizong diaocha*, or "CSDPS"), respondents were asked who was the most important influence in their choice of which college to attend. Roughly half of students (47-48%) in both surveys listed themselves, followed by parents or other family members (35-40%), and then teachers, friends, and other non-family members.

3 Expected effects

In this section, we outline our ad-ante expectations for how college name changes will affect the decisions of college applicants and, separately, employers seeking to hire college graduates.

3.1 Expected effects for college applicants

College applicants generally have imperfect information about college quality (Dillon and Smith, 2017; Bo et al., 2019; Mulhern, Forthcoming).[17] A series of papers has shown that more observable characteristics of colleges may have an outsize influence on enrollment decisions, relative to less observable or measurable characteristics, such as instructional quality or the strength of the alumni network.[18] College names are a highly visible contributor to college reputation; as discussed, many colleges in this and other contexts have changed their names to attract higher-qualified students (Line, 2015; Platt et al., 2017; Acton, 2020; Clinton, 2020).

Because of their relative lack of information about college quality, we expect college applicants' choice of college to be swayed by college name changes. This comes from two separate effects. One, because college applicants do not have complete information about college quality, their beliefs are likely to be affected by changes to signals about college quality, such as college name changes. Two, applicants observe the average college entrance exam score among students enrolled at the college in the previous year.[19] As a result, any initial increase in entrance exam scores caused by the change in college name serves as an additional positive signal about the college's quality. This confirmatory signal makes the initial gains from a college name change more

[17] Hoxby and Turner (2015) report a US-based survey of high-achieving, low income students' knowledge about their college choices. They find that these students lack information about "net prices, instructional resources and rigor, student bodies, and curricula." The authors highlight one common misperception particularly relevant to our study of college names in this paper: many of the students surveyed thought liberal arts colleges were either politically liberal and focused on the humanities or the visual arts.

[18] Existing work on middle school choice and high school choice suggests that small doses of information can lead to observable changes in school choice (Hastings and Weinstein, 2008; Andrabi et al., 2017). Hoxby and Turner (2013) show that that college choice is also affected concerted doses of information. Other work shows that salient but seemingly uninformative news – such as small changes in the school's placement in third party rankings or close victories in college sports – can also have detectable effects on college application behavior and matriculation (Pope and Pope, 2009; Alter and Reback, 2014).

[19] See Section 2.2 for more details on this score and other general information about the system.

likely to persist over time.

The main source of heterogeneity we expect is by access to information. The less information an applicant has about the college, the more we anticipate their perception of a college's reputation will be affected by a change in name.[20]

3.2 Expected effects for employers

Employers have substantially more information about college quality than college applicants. The HR professionals responsible for making hiring decisions have already graduated from college, and their main professional responsibility is to gather information about applicant quality and make decisions based on this information. An online survey of HR professionals we conducted confirms this intuition.[21] The surveyed HR professionals were aware of the phenomenon of college name changes and believed these changes would result in the college attracting and producing better students.[22]

If college name changes generate differences in student quality over time, then we would expect employer decisions to reflect this. This could affect callbacks positively or negatively. For the majority of jobs, we would expect applicants listing a college's new name to be more likely to receive callbacks than those listing the old name, as they would be of higher quality. On the other hand, we expect a possible negative impact of college name changes on callback rates among applications to jobs where there is greater risk of hiring an over-qualified candidate. The surveyed HR professionals indicated that for relatively lower-paying jobs, applicants listing a college's new name might be overqualified and therefore less attractive to the employer than those listing the old name.[23] Several recent studies of the labor market find similar fears among HR professionals and

[20]This comes from the basic intuition behind bayesian updating: the less informed a person's prior is, the larger their update will be to a given amount of new information.

[21]The survey consisted of multiple choice and free response questions. We located participants through the professional network of one of our research assistants, a part-time MBA student who was working as an HR professional. We provide further details of the survey in Appendix D.

[22]They noted that this reputation effect likely benefitted all students on the job market, even those who entered the school before it changed its name.

[23]The reason for this, they explained, was that the applicant might be overqualified and thus at greater risk of low performance or even quitting, necessitating another costly search.

penalties to overqualified applicants in a wide range of contexts (Deming et al., 2016; Chen, 2019; Sekhri, 2020). We predict this will appear more in jobs with lower requirements for technical skill (i.e., depending on the needs specific to the type of job), lower credential requirements, and lower experience requirements.

Analysis of publicly available data from the written part of China's civil service exam corroborates our assumption of near-perfect employer information. In this data, we see that applicants who graduate from a college after the name change earn better scores on the civil service exam than applicants who graduate from the same college before it changed its name. We present the results in Appendix E. While not causal, this suggests that, from the observational perspective of hiring professionals, graduates listing new college names are likely to display greater aptitude than those listing its old name.

4 How do college applicants respond to name changes?

In this section, we study how college applicants respond to college name changes. We use administrative data on the average and maximum college entrance exam scores among admitted students to a college, from each province, in each track, by year, from 2006-2016. Our data covers 95% of Chinese colleges and comprises roughly 420,000 data points, summarizing scores from approximately 40 million students. Henceforth, we will refer to these as "CEE" scores (in Chinese, *gaokao* scores). We use a difference-in-differences research design to estimate how name changes affect average and maximum CEE scores of enrolled students at name changing colleges, compared to those at essentially all other colleges in the market for these applicants.

4.1 Data

Our main dataset is college-level CEE score information scraped from a leading educational website, "China Education Online" (www.eol.cn). The administration of this site is supervised by China's Ministry of Education. We limit our analysis to colleges that are qualified to issue bach-

elor's degrees.[24] We also exclude military colleges. This leaves us with 1,198 colleges in our analysis sample, comprising roughly 95% of the 1,265 bachelor's degree granting institutions in China.

These data contain the average and maximum CEE score, by year and by the home province of students, for all enrolled students in the science and humanities track, respectively, in each college.[25] In some of these cells, there are two tier-specific observations, reflecting the fact that at a given school, some majors within a track may be of higher status (tier) than others. Over the period of our study, each major–track–college–province cell was assigned to one of three tiers, and admissions in each cell are subject to students reaching the tier-specific minimum CEE score set by the Ministry of Education. Our unit of observation is therefore at the college–province–track–year–tier level. These data range from 2006 to 2016. Because test questions vary each year and, within a year, vary across provinces and across tracks, we standardize test scores at the province–year–track level.

To identify the incidence and timing of college name changes, we hand-coded information posted on college websites and on the website baike.baidu.com, a Chinese analog to Wikipedia.com. Among the 1,198 colleges in our analysis, 244 colleges (20.4 percent) changed names between 2006 and 2016. We employ two additional datasets for the analyses in this section. First, we use annual data for 711 of the 783 public colleges in our sample regarding the college's research funding and output, spanning from 2007 to 2016. These data include the amount of research funding under management by the college, the number of faculty members at the college, the number of scientific projects at the college funded by the national government, and the number of academic papers published faculty members there. We gathered these data from the College Science Statistical Yearbooks (*gaodeng xuexiao keji tongji ziliao huibian*) published by the Chinese Ministry of

[24]This is primarily to allow us to focus on a single market: that for bachelor's degrees. While the market for associate's degrees is also of interest, in our data there is also a substantial proportion of empty cells among colleges that only issue these degrees.

[25]As mentioned in Section 2, students in a given track only compete for admission with other students from the same province. Note also that minimum scores are set annually by the government at the province-track-tier level, but in most cases this is not binding, as the minimum score at a given institution is determined by the demand for that particular college-track-tier combination in that year.

Education. Second, we use data on enrollment quotas at the province-year-track level from 2008 to 2015, scraped from another leading educational website in China that focuses on China's college entrance examination.[26]

4.2 Empirical strategy

The goal of our empirical analysis in this section is to estimate how college applicants respond to college name changes. To estimate this relationship, we use a difference-in-differences (DiD) design, regressing the average CEE score of a college on the use of the new name, along with a set of fixed effects and controls to isolate the difference in score within colleges, across the old name-new name threshold, as compared to the rest of the market for college applicants.[27] Our main estimating question is

$$y_{cpstr} = \beta_0 + \beta_1 NewName_{ct} + \theta_c + \mu_t + \eta_p + \beta_2 s_{cptr} + \beta_3 r_{cpst} + \varepsilon_{cpst} \quad (1)$$

In this equation, y_{cpstr} is the CEE score (mean or max) for a given college c, of students from a given province p, in a given track s (science or humanities), in a given year t. As described above, in some cases, there are two observations (one per tier r) within a college–province–track–year cell. Our main coefficient of interest is β_1, the impact of a new name on the average CEE score of students who enroll at the college. The variable $NewName_{ct}$ is an indicator for the college having changed its name and is equal to one in all years after the change.

Five sets of controls are crucial to our identification strategy. The first is the set of fixed effects at the college level, θ_c, to ensure that we are comparing only within a given college, across time.

[26] http://www.gaokao.com/

[27] This approach differs from more common applications of the DiD design which identify a specific comparison group. In our use of the DiD, we are comparing name-changing institutions to all other institutions in the market for college applicants, thus avoiding the need to deal with issues of how to ensure the selected group is an appropriate comparator. See Callaway and Sant'Anna (2019) and Goodman-Bacon (2019) for further discussion of these issues. In Appendix F, we show that our application does not suffer from the "negative weights" problem identified in these papers. Note also that, as a result of our comparison with the entire market, our recovered estimates will be closer to the general equilibrium effect of a name change, i.e., after all market interactions in response to the name change occur, as opposed to the partial equilibrium effect.

The second is the set of year fixed effects, μ_t, which removes variation from time trends secular to changes in college names. The third is the set of province-level fixed effects, η_p, which ensures that we are comparing only among applicants from within a given province, the level at which applicants compete.[28] The fourth is the control for whether a given score is from the science track, s, as opposed to the humanities track. We control for tracks because scores are standardized at the province-year-track level. Finally, within a college–province–track–year cell, different majors can be in different tiers, which we control for with r_{cpst}. We control for tiers because, within a college and within a track, majors in different tiers have different minimum score requirements.[29]

Our main identifying assumption is the standard parallel trends assumption. Here, since our main comparison is of name-changing colleges to the entire market, for identification we need that the scores of the "treated" group exhibit parallel trends relative to the rest of the market of colleges vying for college applicants. Given that there are many different treatment years, we assess this primarily through the event study (Figure 2), which shows no evidence of a statistically significant difference in test score trends prior to changes in college names.

4.3 Main results

We present our first set of main results in Table 2. In column 1, we use all colleges who changed their names as the "treated" group. In column 2, we show results for the subsample of colleges whose name change contains a shift from the word college (*xueyuan*) to university (*daxue*).[30]

We estimate that, on average, a change in name is associated with a statistically significant increase of 0.057 SD in the average CEE score (shown in column 1). Estimating the effect for only schools which changed their name from college to university, our estimated coefficient increases to 0.077 SD (column 2), suggesting that those colleges harvest a large increase in school reputation by adding the word "university" (*daxue*) to their names. The sign of our results is broadly consistent

[28] All of our results are robust to using province-by-year fixed effects instead of province and year fixed effects separately.

[29] Tier and name change in the same year in only 380 of the 10,514 treated college-province-track cells. Our results are all also robust to the exclusion of these cells.

[30] In other words, all public colleges with type 1 and type 4 name changes, as described in Table 1.

Table 2: Overall effects of name changes on CEE scores of enrolled students

	(1) All name changes	(2) Only college to university
Effect on average CEE score (in SD units)	0.057*** (0.003)	0.077*** (0.004)
Number of colleges that changed names	244	109
Total number of colleges in sample	1,198	1,198
Number of observations	418,441	418,441

Note: this table shows our estimates of how college name changes affect the mean CEE scores of students enrolling in name changing colleges in a given year, as compared with institutions who did not change their names. The row entitled "Effect on CEE average score in SD units" reports our estimate of β_1 in Equation 1 for the treated group named in the column heading. * p < 0.1, ** p < 0.05, *** p < 0.01.

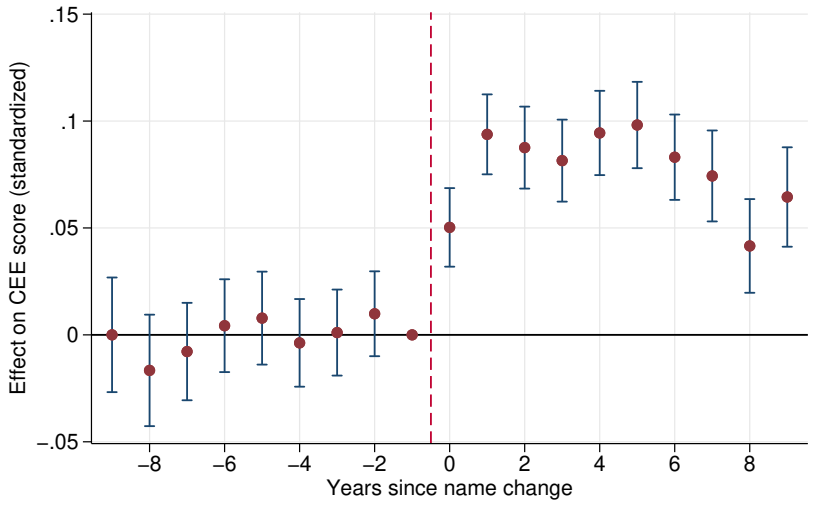
with related work showing how salient public information on US colleges increases application rates to these colleges. Pope and Pope (2009) find a 2-8% increase in applications as a result of a college's basketball or football team winning a close victory. Alter and Reback (2014) find a 5.6% increase in applications that occurs with a salient listing in the US News & World Report college rankings.

In Figure 2, we show the event study for the analysis in column 2 of Table 2. This shows point estimates and confidence intervals derived from replacing the $NewName_{ct}$ variable in equation 1 with a series of dummy variables for the number of years elapsed since the college's name change:

$$y_{cpstr} = \alpha_0 + \sum_{T=-9}^{9} \alpha_{1.T} NewName_{T_{ct}} + \theta_c + \mu_t + \eta_p + \alpha_2 s_{cptr} + \alpha_3 r_{cpst} + \varepsilon_{cpst} \quad (2)$$

Prior to when a college changes its name, average CEE scores appear relatively flat. After the name change, there is an immediate and sustained increase. This suggests that efforts to signal higher quality in this way may be self-reinforcing, generating a sustained improvement in the quality of the college via attracting better students.

Figure 2: Event study - effects of name changes on average CEE scores over time



Note: this figure shows the coefficient estimates and corresponding confidence intervals from estimating Equation 2 and the treated group in column 2 of Table 2, that is, colleges whose name changes include a change from college to university.

We also create a crosswalk to understand how these test score gains map onto changes in national rankings. Using our main estimating equation, but using college rank as the dependent variable and average CEE score as the main explanatory variable, we see that our estimated effect of name changes, a 0.057 SD change in test scores, would move a college in the 313th rank to the 272nd. The larger effect of a change from "college" to "university" would move that same college to the 258th rank.

We finish this subsection with a series of robustness checks for these results. First, we estimate how CEE scores vary over time among colleges whose initial applications to change their names failed. We located records for nine colleges whose initial applications to change their names were denied, and who then reapplied and were later successful. These colleges took several years to prepare materials and, ostensibly, believed themselves qualified to change their names at the time of their initial application.[31] We have the time of the initial (failed) application, and classify the

[31] While we do not know the reason for failure, in some cases, the proposed new name was seen to be controversial and opposed by other colleges. For instance, Tangshan College (*tangshan xueyuan*) attempted to change its name to

"failed treatment year" as the year after the application year, i.e., when the name change would have been approved had it not failed.

In Table A.1, we generate two sets of estimates for these colleges. In column 1, we report our estimates of the impact of a failed name change, using the year of the rejection as the year in which the name should have changed. In column 2, we show a similar estimate, only using the later year of successful name change to determine treatment status. In both regressions, we use the entire market in the untreated group, i.e., including other name changing colleges with no failed applications with the group of colleges that did not change their name in this period.

Our estimate of the effect of a failed name change on the average CEE scores of enrolled students at these institutions is indistinguishable from zero ($\beta_1 = 0.001$, with a standard error of 0.012). Since these colleges had to improve their facilities, faculty, and other resources in order to be eligible to apply for a name change, we infer from these results that our estimates in Table 2 reflect students' response to the change in name, not to changes in other aspects of the college. The estimate for the impact of a successful name change on CEE scores among these colleges, on the other hand, is positive and significant ($\beta_1 = 0.030$, with a standard error of 0.011). This is also consistent with our interpretation that the change in reputation that comes with a name change drives the impact of name changes on CEE scores, as opposed to students' response to changes in facilities or other features of the college.

Second, we conduct the same two regressions from Table 2, only replacing our main outcome variable, the average CEE score of admitted students, with the maximum CEE score among admitted students within a cell. Our coefficient estimates maintain their general sign, magnitude, and significance (results shown in Table A.2).

Third, we show that our results are robust to adding a control for the enrollment quota set for the school. If the school obtains a smaller enrollment quota after its name change, this would artificially inflate its average CEE scores, as it would drop those with the lowest scores who would

Tangshan Jiaotong College (*tangshan jiaotong xueyuan*) in 2018 but failed. This failure is attributed to the fact that the new, proposed name was historically used by other colleges, including Southwest Jiaotong University and Xi'an Jiaotong University (source: https://www.cingta.com/detail/4390, accessed November 26, 2020).

have gained admission were there more slots.[32] We were able to obtain data on enrollment quotas at the province–track–year level for about half of the colleges in our sample. We find that neither adding the enrollment quota as a control, nor using the original specification but restricting the sample to only colleges with non-missing quota data, has any measurable impact on our main estimates; we show these results in Table A.3.

Fourth, we estimate how different "types" of name changes affect college choice. In Appendix Table A.4, we show three estimates – the effect for colleges whose name changes include the change from "college" to "university" (as in type 1 and 4 of Table 1); for colleges whose name changes did not include the change from college to university (types 2 and 3 from Table 1); and the estimate for only private colleges who changed their names, treated separately because these colleges are generally of lower status than public ones. This shows positive and significant effects for all name change types, with the largest effects for changes that include the "college" to "university" shift.

Finally, we show that these patterns also appear in individual-level data from Chinese high schools. Some Chinese high schools post the CEE scores of their students and the colleges these students attend on their websites. We scraped this data from the websites of 14 high schools, across six different provinces, and spanning 20 years. While this is a selected sample, we can use it to estimate whether the average scores of children going to a given school go up when the school changes its name, akin to columns 1 and 2 of Table 2. We present these in Table A.5, and find similar patterns, with a significant, positive impact of name changes on the average score of enrolled students, and a larger effect for institutions whose name change includes the switch from "college" to "university."

[32] In fact, it is more likely for a school to obtain a larger (rather than a smaller) enrollment quota after its name change. Because a school with a new name is more likely to experience greater demand from students, it is thus more likely to obtain a larger enrollment quota from the Ministry of Education. If this occurs, our estimates are likely to instead *under*-estimate the effect of college name changes on the quality of enrolled students as, ceteris paribus, a greater number of slots would lead to a lower average score of entering students.

4.4 How do the effects of name changes vary by the information applicants have about colleges?

As described in Section 3, an important dimension of college choice is the information students have about different colleges. In this section, we show whether the magnitude of our estimates varies with the information applicants have, or can access, about the college. Our analyses suggest that college name changes have a greater effect on the college choices of applicants with less information, either about the specific college, or about colleges in general.

Our first analysis compares the estimated effect among students from within the same province in which the college is located to the effect among students from outside of the province. We show these results in Panel A of Table 3. Our estimates of the change in CEE scores that comes with a change in college name are much larger for out-of-province applicants than they are for within-province applicants. These results are consistent with the out-of-province applicants being less familiar with the institution to begin with – and thus more likely to be influenced by the new name – than students applying from within the same province. This mirrors results from both Loyalka et al. (2016) and MacLeod and Urquiola (2019).[33]

Our second analysis estimates heterogeneity in the effect of name changes across time. Over our study period (2006-2016), access to the internet changed dramatically in China. In light of the fact that access to the internet makes information on college quality more accessible, we break the period in half, estimating the effects from 2006-2010 and, separately, from 2011-2016. We show these results in Panel B of Table 3. As anticipated, we see substantially larger effects in the earlier period, where college quality information was harder to come by, than in the later period.[34]

[33] We also conduct a related analysis, dividing the sample into colleges located in large cities and colleges located in small or medium-sized cities. The intuition behind this comparison is that colleges in larger cities operate in an environment with more people and more flow of information than colleges located in smaller cities. We show these results in Table A.6; as predicted, the effect of a name change is much larger among colleges located in small or medium-sized cities than those located in large ones.

[34] In the appendix, we show heterogeneity analysis by college rank, with results in Figure A.1. Among colleges ranked 101-400, we see larger impacts of a name change while colleges ranked below 400th, i.e., less prestigious colleges, experience a significant but smaller benefit from changing names.

Table 3: Effect of name changes on CEE scores - heterogeneity by information

Panel A: Within-province vs. out-of-province applicants

	Within-province applicants		*Out-of-province applicants*	
	(1)	(2)	(3)	(4)
	All name changes	College to university	All name changes	College to university
Effect on average CEE score (in SD units)	0.041***	0.043***	0.059***	0.080***
	(0.010)	(0.014)	(0.003)	(0.004)
Colleges that changed names	232	104	244	109
Colleges in sample	1,183	1,183	1,183	1,183
Number of observations	25,139	25,139	393,292	393,292

Panel B: Earlier vs. later name changes

	Name change in 2006-2010		*Name change in 2011-2016*	
	(1)	(2)	(3)	(4)
	All name changes	College to university	All name changes	College to university
Effect on average CEE score (in SD units)	0.072***	0.084***	0.037***	0.056***
	(0.005)	(0.006)	(0.003)	(0.005)
Colleges that changed names	98	56	146	53
Colleges in sample	948	948	878	878
Number of observations	357,098	357,098	297,569	297,569

Note: this table shows tests of our hypothesis about heterogeneity in effect size related to applicants' access to information. We generate estimates under the following restrictions of the sample: in Panel A, we use only enrolled students from the same province as the college (columns 1 and 2) or from outside of the province (columns 3 and 4). In Panel B, we divide the treated group into colleges that changed their names in the first half of our time period and those who changed their names in the second half. The row entitled "Effect on average CEE score" reports the results for estimating β_1 in Equation 1 for the group named in the column heading. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4.5 Absolute gains associated with name changes

Each year, colleges compete for students. As a result, a large component of our estimates may come from the college attracting students who would have otherwise attended another competitor college. We attempt to separate this relative gain from the absolute gain in student quality by restricting the comparison (or "untreated") group to two alternative control groups unlikely to be affected by competition from colleges which changed their names over this period.

First, we use an elite group of colleges defined by the "Project 211" policy as our untreated group of colleges.[35] None of the colleges in this group changed their name during our sample period (2006-2016). Furthermore, since the average ranking of name-changing colleges in our sample was 313, and the average ranking of these elite colleges was 60, the name changes that occur in our study period are unlikely to attract students who would otherwise have enrolled at an elite college.

We show our results in Panel A of Table 4. Our estimate of the impact of a name change on CEE scores, relative to the average CEE scores of students enrolled in elite colleges, is a smaller but still statistically significant gain of 0.015-0.02 SD. This is consistent with the notion that our estimates of the overall impact of name changes on CEE scores partly reflect the zero sum nature of competition for students between similarly ranked colleges.

In Panel B of this table, we show results from an alternative strategy, expanding the control group to be all Tier 1 colleges which did not change their names. These colleges are a larger group, similar to the combined group of large research institutions and elite liberal arts colleges in the US, and their average ranking is 123, somewhat lower than the Project 211 colleges. The coefficients we estimate here are larger in magnitude than those in Panel A, consistent with there being some competition between Tier 1 colleges who did not change their name and the group of all colleges which changed their name over this period. These estimates, however, are much smaller than those in columns 1 and 2 of Table 2, reflecting the fact that many of the colleges

[35] In 1995, the "Project 211" policy was created to identify 100 colleges with high levels of research standards who would prepare China for the 21st century. The moniker was a concatenation of these goals: 21st century + 100 universities $\rightarrow$ "Project 211" (Yu et al., 2012). This group was later expanded to incorporate additional institutions.

Table 4: Using elite colleges only as the control group

Panel A: Elite 211 universities as comparison group

	(1) All name changes	(2) College to university
Effect on average CEE score (in SD units)	0.015*** (0.003)	0.020*** (0.004)
Colleges that changed names	244	109
Colleges in sample	359	223
Number of observations	148,976	106,194

Panel B: Tier 1 institutions without name change as comparison group

	(1) All name changes	(2) College to university
Effect on average CEE score (in SD units)	0.029*** (0.003)	0.037*** (0.004)
Colleges that changed names	244	109
Colleges in sample	636	503
Number of observations	181,533	138,758

Note: this table shows the effects of college name changes on the mean CEE scores of students enrolled in the college, compared to the scores of students enrolled at elite colleges who did not change their names over this period. Panel A uses all "Project 211" colleges as the comparison group. Panel B uses all "Tier 1" colleges which did not change their name as the comparison group. These groups are further described in the text. The row entitled "Effect on average CEE score" reports the results for estimating β_1 in Equation 1. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

which change names are much lower ranked than Tier 1 colleges, and thus unlikely to compete with them for students.

5 How do employers respond to college name changes?

In this section, we use a resume audit study to examine how employer recruitment behavior responds to college name changes. In particular, we estimate whether there is a premium for applicants listing a college's new name, relative to its old name. We also estimate whether there exist patterns of heterogeneity related to the employer's geographic distance to the college similar to those we observed among college applicants.

In addition, we test our auxiliary hypotheses about heterogeneity in the sign of our estimates described in Section 3. In a world where employers have perfect information, we expect a small new name premium in most jobs. This is because, as we show in the previous section, colleges that change names are successful in attracting better students. In lower-paying and lower-status jobs, however, we anticipate a potential new name penalty. This is a result of employers perceiving applicants listing a college's new name as over-qualified for some jobs.

5.1 Research design of resume audit study

Several aspects of the Chinese labor market facilitate this resume audit study. First, China has the world's largest labor market. As of 2018, there were 775.9 million people officially employed according to government records (Ministry of Human Resources and Social Security of the People's Republic of China, 2019b). Second, the vast majority of employees work in private firms; since 2012, more than 80% of Chinese workers have been employed in the private sector (Li et al., 2012). Finally, much of the search for these jobs occurs via the internet: according to government statistics, approximately 76 percent of job openings are currently posted online (Ministry of Human Resources and Social Security of the People's Republic of China, 2019a).

We sent over 14,000 fictitious resumes to employers across six cities in China between Novem-

ber 2018 and November 2019. Our approach follows a rich history of resume audit studies investigating questions of importance to the general public, such as the value of for-profit colleges (e.g., Darolia et al., 2015, and Deming et al., 2016) and the extent of race-based discrimination in the labor market (e.g., Bertrand and Mullainathan, 2004, and Agan and Starr, 2017).

We focus on the main type of name change we analyze in the previous section - the change from "college" to "university." We submitted resumes to jobs in the following two industries: computer programming and human resources/administration (in Chinese, *xing zheng*).[36] These two job types were among the top six occupations in terms of number of posted jobs and top three in terms of number of job applicants in the fall of 2018.[37] We use two job posting websites in China – *www.51job.com* and *www.zhaopin.com* – as our main sources for job advertisements. These are the two largest job sites in China[38] and have been used in other studies on China's labor market (Kuhn and Shen, 2013).

In addition to varying on industry type, the resumes we submitted varied on three other key dimensions: work experience, location of college, and college name. For the first dimension, experience, we submit resumes with the appropriate amount of experience to jobs that ask for either two years or five years of experience, respectively. The second dimension is whether the college listed on the resume is located in the same province as the city of the job being applied to, or in the province of one of the other five study cities. The third dimension is whether the resume listed a college's old name or its new name.

Each resume lists the name, email address, phone number, work experience, skills, and simple biographical information for the applicant. We created resumes using realistic applicant characteristics based on publicly available resumes posted on those two job sites. Specifically, we populated a data pool of potential work experience for each [job type–experience] meta-cell with the work experience listed on resumes taken from a corpus of resumes collected online. We then randomly assigned experience entries from this pool to populate each resume. Before finalizing the resumes

[36] Deming et al. (2016) also focus on two industries. Given the skill-specific nature of these postings, we focused on jobs advertising positions for programmers skilled in the java language.

[37] According to https://www.hroot.com/detail.aspx?id=9383823, accessed January 15, 2019.

[38] According to https://www.sohu.com/a/155316030_182188, accessed January 2, 2019

Table 5: Description of resumes

Dimension	*Possible values*
City of job posting	Hangzhou; Hefei; Shanghai; Wuhan; Xi'an; Zhengzhou
Industry	Computer programming; administration (*xing zheng)*
Experience level	Two years; five years
Resume origin	Local (within-province); non-local*
Name of college	Old name; new name**

Note: this table shows the dimensions of variation across which our resumes varied. *: Non-local resumes came from two of the other cities in the sample, randomly selected so that each city was equally represented. **: We used only colleges whose name change was from college to university.

to be used in the study, each resume was vetted by a team of three HR professionals to ensure its appropriateness for that type of job posting. Table 5 lists the dimensions of variation in the resumes we submitted.

Applicant information had to be manually entered onto the website before we could deploy the applicant's resume to a given job. Within each [job type–experience–city–within province/outside of province] cell, we created four resumes: two from one college and two from another. Each within-college resume pair consisted of one resume listing the college's new name, and one listing the old. In total, this gave us 192 resumes. We contracted a team of four human resources / hiring professionals to vet each cell of resumes for two concerns: one, that a given resume was inconsistent or not believable, and two, that the two resumes within each cell were similarly desirable from the perspective of the employer. Due to evidence of explicit gender discrimination in many labor markets in China (Kuhn and Shen, 2013; Kuhn et al., 2018), all resumes within each job type were of the same gender: only resumes listing male names were submitted to jobs in programming, and only resumes listing female names were submitted to jobs in administration.

We submitted resumes to jobs in six labor markets – Hangzhou, Hefei, Shanghai, Wuhan, Xi'an, and Zhengzhou. We picked these cities because the provinces they are located in each

had two colleges which had changed names in the last five years, facilitating the construction and submission of resumes which could plausibly list either the old or new name.[39] In addition, they are large cities with robust labor markets in both of the industries we chose and were selected to be representative of labor markets for recent graduates in the three main geographic regions of Mainland China.[40]

Our job application process proceeded as follows: every day, each member of a team of research assistants was given a quota of jobs to find in a given city within a given industry (programming or administration) and given required experience level (two years or five years). They confirmed the appropriateness of the job, then began the submission process. First, they submitted one resume (randomly chosen from the pair). After at least 12 but no more than 36 hours, they submitted the second resume. We chose to submit paired resumes following the example of previous resume audit studies (e.g., Deming et al., 2016).

Our main focus in this study is the comparison of the callback rate for resumes which list the old name of a college with that of similar resumes which list the college's new name.[41] A second source of variation we care about is the extent to which the old name/new name differential varies by the geographic proximity of the job to the college. We operationalize this with a binary variable: whether or not the resume lists a college that is located in the same province as the job in question.[42] A final characteristic of interest is whether the old name/new name callback difference varies with the amount of experience of the candidate.[43] For our resumes, we used only

[39]We chose to list colleges that changed names around the year of the fictional students' graduation so that listing the new name or old name would both be plausible. Indeed, in the civil servants data, we observe hundreds of cases of pairs of students who appear to have graduated from the same institution in the same year, but with some listing the institution's old name and others listing the new name.

[40]Eastern region: Shanghai, Zhengzhou. Central region: Hangzhou, Hefei, Wuhan. Western region: Xi'an.

[41]Note that these callback rates make up the first round of a longer recruitment process. As such, we expect the HR professionals whose callbacks we record will have examined hundreds of resumes each day. As a result, we argue that it is unlikely for them to have the time to search for and confirm i) whether a given school had changed its name, ii) if so, in what year, and iii) whether the person listed on the resume entered the school before or after the name change. Rather, we anticipate that, as described in Clinton (2020), they will simply look at the college name and infer the school's status from various markers – e.g., college vs. university – taking into account the selection effects we estimate in the previous section.

[42]Each of the cities we chose is located in a different province.

[43]Note that experience is collinear with time elapsed since the college changed its name; the diffusion of information over time may also generate a difference in old name/new name callback rates. We anticipate both effects to push in the same direction: as time elapses, we expect less of an impact of the name change, both because people will have

colleges which allow us to plausibly list either the new or old name based on date of enrollment and graduation. Specifically, in the resumes listing two years of experience, the colleges we used changed their names in 2016 or later; for resumes listing five years of experience, we used colleges which changed their names between 2012 and 2015.[44]

5.2 Data

Our main goal was to collect data on the rate at which resumes received callbacks. We designed the survey with the goal of roughly equal distribution of resume submission across industries (administration vs. programming), experience levels (two years vs. five), and geographic proximity of job and college (within-province vs. out-of-province). Our initial sample size was 14,976 resumes to be submitted in 7,488 pairs. We ultimately had to discard 308 pairs of resumes (4.1 percent of the total), either because more than one pair was submitted to the same posting, or because the posting was taken down between the time when the first resume was submitted and the scheduled time for submission of the second resume. We discarded results related to an additional 104 jobs because the resumes submitted to these jobs were accidentally from different pairs.

We collected data at two intervals: at the time of resume submission and when callbacks were received. At the time of resume submission, we collected the following job information from the online posting: the listed salary range of the position; the size of the company in terms of employees; the minimum required credential (i.e., a high school degree, an associate's degree, or a BA); whether the employer is a private company or government entity/state-owned enterprise; and the address of the company. For each resume submission, we recorded whether the employer made a callback. We show summary statistics for the resumes in our study, both overall and across the main dimensions of heterogeneity, in Table 6.

more time to familiarize themselves with the name change, and because for candidates with more work experience, the relative importance of the name of the candidate's college decreases.

[44]The full list of colleges, with their old name, new name, and date of name change, are given in Table A.7. We used only colleges whose name change included the change from college to university.

Table 6: Summary statistics for resume audit study

	(1) Received callback	(2) Number of observations
Overall	0.136	14,152
Two years of experience	0.141	7,412
Five years of experience	0.131	6,740
Local	0.139	6,990
Non-local	0.133	7,162
Programming	0.130	7,206
Administration	0.143	6,946

Note: this table shows summary statistics on the rate at which resumes received callbacks, and the number of observations, across the main dimensions of heterogeneity in our resume audit study.

5.3 Analysis methods

Our pre-specified primary outcome is a simple comparison of means: we calculate a two-sample t-statistic testing the null of equality of callback rates between resumes listing an old college name and those listing a new college name.[45] Because our sample is, by construction, balanced on observables, we do not control for additional differences in our primary specification. Our pre-specified heterogeneity analysis conducts similar t-tests on subgroups of the data. Subsequent pre-specified secondary analyses use ordinary least squares linear probability regressions, using the old name as the baseline case, and adding controls for job type, experience level, and whether or not the resume lists a college from a local area or a non-local area. Our main specification is:

$$y_{ije} = \gamma_0 + \gamma_1 NewName_{ije} + \vartheta_j + \delta_e + \zeta_l + \varepsilon_{ije} \tag{3}$$

[45] We wrote and registered a pre-analysis plan for this part of our study. Available at socialscienceregistry.org, AEARCTR-0003669.

Here y_{ije} is an indicator for whether resume i in job type j (admin or programming) in experience level e (either "two years or less" or "three to five years") receives a callback. ϑ_j, δ_e, and ζ_l are fixed effects for the job type, experience level, and whether the college is local to the job being applied to, respectively. ε_{ije} is an error term at the resume level.

We also estimate whether the old name/new name callback differential varies across industries, between resumes listing local colleges and those listing non-local colleges, and between resumes listing two years of experience vs. those listing five.[46] To follow Deming et al. (2016), we also display a slightly different format of these regressions, estimating the equation separately by job type, experience, and local/non-local status.

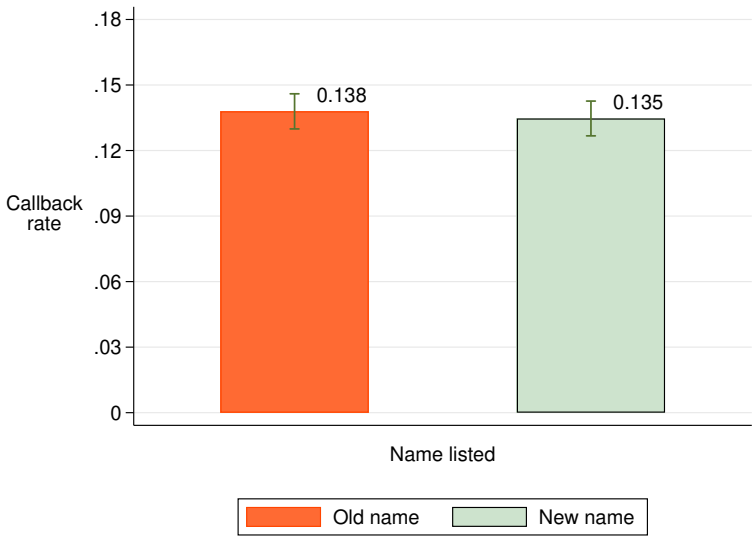
5.4 Main results

Our primary outcome is the comparison of callback rates for resumes listing the old names of colleges compared to the callback rate for resumes listing their new names. We show the means for each group, with the associated confidence intervals, in bar chart form in Figure 3. This shows a remarkably similar callback rate for the two resume groups of just over 13 percent. The difference in means is 0.325 percentage points, and the p-value for the comparison of means is 0.573; we are unable to reject our null that the callback rates were the same for the two types of resume. Furthermore, the confidence intervals generated by these estimates can exclude anything larger than a 1.46 percentage point difference in callback rates between resumes listing a given college's old name and those listing its new name.[47]

[46] Equivalently, between those that changed their names more recently (2016 or after) compared with colleges that changed their name less recently (between 2012 and 2015).

[47] For reference, our study design powered us to detect a minimum difference of 1.15 percentage points in callback rates, from a baseline of 10 percent of old name resumes receiving callbacks.

Figure 3: Overall difference in callback rates



Note: this figure shows the callback rate for all resumes, separately by whether the resume listed the college's old name (orange) or new name (green), along with confidence intervals of the estimate of the callback rate. The p-value for a test of the null of equality between the estimated callback rate for the two groups is 0.573.

Next, we analyze differences in the callback rate between resumes listing the old name vs. the new name across subgroups. First, we study whether the old name/new name callback differential varies for resumes listing a college from the same province as the job applied to, compared with resumes listing a college from outside of the province. In Panel A of Figure 4, we show the within-province callback rate for old name and new name resumes, respectively, in the left two bars, and the corresponding out-of-province rates in the right two bars. The callback rate for resumes listing the old name of within-province colleges is 0.83 percentage points higher than those listing the new name, but this difference is not statistically significant (p-value for t-test of equality of callback rates: 0.32). The callback rate for out-of-province resumes listing the old name is 0.11 percentage points lower than those listing the new name, but again this difference is insignificant (p-value = 0.89). We interpret this as evidence that employers' response to college name changes varies less with geographic distance from the college than college applicants' response (as shown in Table 3). This finding is consistent with our predictions in Section 3 stemming from the assumption that

employers have better information than applicants.

In Panel B, we show the old name/new name difference in callback rates across resumes that list two years of experience, relative to those that list five years. Among resumes with two years of experience, those listing the college's old name are 1.51 percentage points more likely to receive callbacks than those listing the new name, though this difference is only marginally statistically significant at traditional levels (p-value = 0.062). Among resumes with five years of experience, those listing the college's old name are 0.98 percentage points *less* likely to receive a callback than those listing the new name, but this difference is also not statistically significant (p-value = 0.234). In Panel C, we show the old name/new name callback differential across resumes in the two different industries we targeted, administration and programming. For jobs in administration, resumes listing a college's old name were 1.53 percentage points more likely to receive a callback than those listing the college's new name; this difference is again on the margin of statistical significance (p-value = 0.070). Resumes submitted to programming jobs listing a college's old name were 0.83 percentage points less likely to receive a callback than those listing the college's new name (p-value = 0.29).

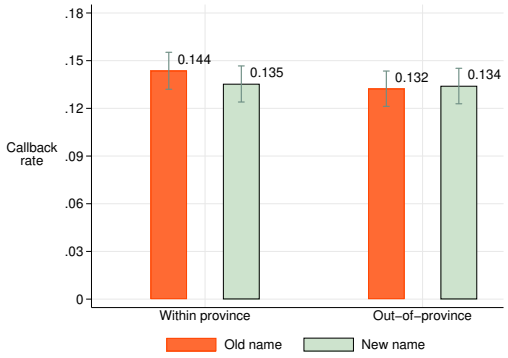
We show the regression equivalent of these results in Table 7. We did not pre-specify any further within-group analyses (e.g., within job type, by years of experience or local/non-local). Instead, we present these as non pre-specified, exploratory analyses in the next subsection, along with our interpretation of the patterns we observe.

5.5 Heterogeneity by job type

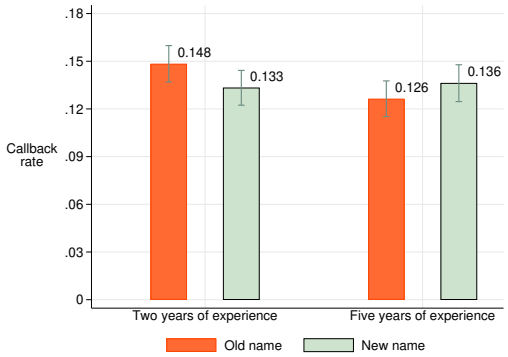
In this section, we present exploratory analyses of callback rates by job type.[48] As discussed in the introduction, one stylized fact emerging from large scale resume audit studies in numerous contexts – including the US, China, and India – is that in some cases there may be a penalty for resumes which list traits that signify applicant quality, relative to resumes which do not (Deming

[48]These analyses were not pre-specified in our analysis plan. As a result, we see the results in this subsection as primarily hypothesis-forming analyses, rather than analyses testing specific hypotheses.

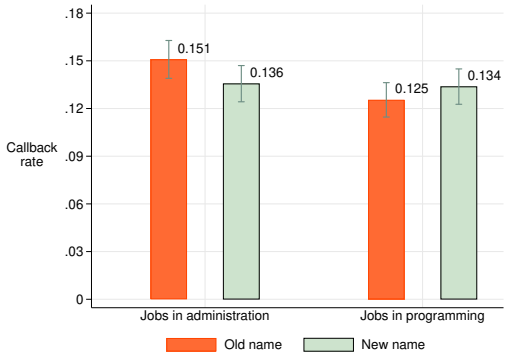
Figure 4: Callback rates by subgroup



Panel A: Difference in callbacks by within province vs. out-of-province college



Panel B: Difference in callbacks by experience of applicant



Panel C: Difference in callbacks by job type

Note: this figure shows the callback rates for resumes listing the old college name (in orange) and the new college name (in green) for three pre-specified dimensions of heterogeneity. Panel A shows this for resumes listing colleges within the province of the job posting vs. outside of the province; Panel B shows this for resumes sent to jobs requiring two or less years of experience vs. those sent to jobs requiring 3-5 years of experience; and Panel C shows this for resumes sent to jobs in administration vs. those to jobs in programming. P-values for these comparisons are given in the text.

Table 7: Main audit study results in regression format

	(1) Coefficient on new college name	(2) Old name callback rate	(3) Number of observations
Entire sample	-0.0033	0.138	14,152
	(0.0058)		
Jobs in programming	0.0083	0.125	7,206
	(0.0078)		
Jobs in administration	-0.0153*	0.151	6,946
	(0.0083)		
Jobs requiring two years of experience	-0.0151*	0.148	7,412
	(0.0080)		
Jobs requiring five years of experience	0.0098	0.126	6,740
	(0.0081)		
College in same province as job	-0.0083	0.144	6,990
	(0.0083)		
College in different province from job	0.0017	0.132	7,162
	(0.0080)		

Note: this table shows results from regressions of the callback rate on the new college name and additional controls, as in equation 3, restricting the sample as described in labels given in the leftmost column. We exclude controls for resume types when appropriate, e.g., we exclude the job type control when restricting the sample to only jobs in administration or programming. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Heterogeneity in new name callback premium by job type

	Jobs in administration		*Jobs in programming*	
	(1)	(2)	(3)	(4)
	Two years of experience	Five years of experience	Two years of experience	Five years of experience
α: New name callback rate − minus old name callback rate	-0.033	0.007	0.005	0.012
α as percent of old name callback rate	-15.5%	9.8%	5.8%	7.0%
P-value of test: $\alpha = 0$	[p=0.010]	[p=0.455]	[p=0.620]	[p=0.342]
Old name callback rate	0.210	0.074	0.079	0.169
Number of observations	3,930	3,016	3,482	3,724

Notes: the first line of each cell in this table shows the parameter α, defined as {[new name callback rate] - [old name callback rate]}. The second line, in parentheses, shows this difference as a percentage of the old name callback rate for that cell, in parentheses. The third line, in brackets, shows the p-value for a t-test of the null: new name callback rate = old name callback rate.

et al., 2016; Chen, 2019; Sekhri, 2020). These penalties arise when the recruiter has reason to believe that the applicant is overqualified for the job. In such situations, the recruiter may privilege resumes without these traits in order to avoid wasting resources on an applicant who would not be a good fit for the job in question.

In this section, we explore the possibility of this type of "heterogeneity by match quality." We first present this by breaking the new name/old name callback rate comparison into four cells, across the four possible combinations of job type (administration or programming) and experience level (two years required or five years required). We present these results in Table 8. In this table, we show estimates of the difference in callbacks between resumes listing a college's new name and resumes listing its old name, a parameter we call α. In addition to α itself, we also show α as a proportion of the callback rate for resumes listing the college's old name and the p-value for a test of the null that $\alpha = 0$.

For jobs in administration, this analysis reveals heterogeneity in α by experience level. For jobs

requiring two years of experience, resumes listing a college's old name are 3.3 percentage points (15.4 percent) more likely to receive a callback than similar resumes listing the college's new name. This difference is highly significant, with a p-value of 0.010.[49] This is precisely the cell where we expect the greatest risk of mismatch, as administration jobs are potentially lower status and certainly less well-paid than programming jobs, and jobs requiring two years of experience are less well-paid than jobs requiring five years. In all other jobs, we see a 6-10% benefit for listing a college's new name, relative to its old name, though these differences are not statistically significant when calculated individually.

To further probe the relationship between potential mismatch and a penalty for listing a college's new name, we conduct a series of exploratory analyses within administrative jobs. We use regression analysis, as described in Section 5.3, to estimate potential heterogeneity across four dimensions: the experience requirements of the job, whether the job is in the same province as the college listed on the resume, the salary listed on the job advertisement, and whether the minimum credential required is an associate's or bachelor's degree.

We show our results in Table 9. We see a larger negative effect of listing a college's new name on the callback rate for jobs with lower requirements, both in terms of experience and in terms of the minimum credential required. We also see that there is a higher new name penalty for colleges which have a higher national ranking than for colleges with a lower national ranking.

These results are consistent with the over-qualification story described in Chen (2019) and Sekhri (2020). Chen (2019) uses a resume audit study to compare the appeal of applicants to jobs in China based on whether their BA was from a US- or China-based college. He finds a similar penalty for applicants listing US-based colleges, particularly at jobs with lower salary or other requirements. Sekhri (2020) finds similar results using administrative data from graduates from elite colleges in India.

Overall, our findings correspond to the main messages from both our survey of HR professionals and the analysis of Chinese civil service data described in Section 3. Employers appear to have

[49]This is still significant when using a Bonferroni correction for multiple hypothesis testing, which would divide the traditional level of 0.05 by 4, yielding a threshold of 0.0125.

Table 9: Further analysis of heterogeneity in callback rates among jobs in administration

Dimension of heterogeneity	Group	(1) Coefficient on new college name	(2) Baseline callback rate	(3) Number of observations
Experience required	Two years	-0.033*** (0.013)	0.210	3,930
	Five years	0.007 (0.010)	0.074	3,016
College ranking	Lower ranked	-0.004 (0.014)	0.170	2,684
	Higher ranked	-0.023** (0.010)	0.139	4,262
Advertised salary	Below median	-0.018 (0.012)	0.173	3,842
	Above median	-0.013 (0.011)	0.123	3,064
Credential required	Associate's degree	-0.019* (0.011)	0.166	4,280
	Bachelor's degree	-0.009 (0.013)	0.116	2,262

Note: this table shows coefficient estimates from regressing the callback rate on an indicator for the resume listing the college's new name, restricting the sample to those jobs in administration also fitting the criterion described in the first and second columns. Regressions control for geographic proximity (local/non-local) and experience level where appropriate. Each row represents the results of a separate regression. For advertised salary and credential required, 42 and 408 job postings, respectively, did not list this data and so are not included in those regressions.

knowledge of the fact that name changes lead colleges to recruit students of higher aptitude. As a result, in most jobs, employers prefer graduates who entered a college after the name change. In lower-status or lower-paying jobs, however, they prefer candidates listing a college's old name to similar candidates listing its new name.

6 Conclusion

The dramatic global increase in college attendance over the last few decades has been accompanied by greater competition between colleges for students. Colleges competing for students work hard to improve their reputation in order to attract better college applicants and to help graduates obtain better job placements. Across many countries and over several decades, thousands of colleges have attempted to improve their reputation by changing their names to signify higher quality, often in a way that leaves fundamentals about the college unchanged. In this paper, we have shown how such college name changes affect college choices and the labor market outcomes of recent college graduates in the largest college market in the world.

Using administrative and experimental data from China, we show that college efforts to improve their reputation through changing their names have real effects. We find that college name changes attract better students, particularly among groups of students who start off knowing less about the college. We find that the labor market premium to applicants listing a college's new name is consistent with these patterns, though smaller in magnitude, and negative in cases where there is risk of mismatch between applicant quality and job status or pay. This mirrors the information we gathered from human resources professionals, which suggests that these professionals have far greater access to information, and skill in acquiring it, than college applicants.

Our paper makes three key contributions. First, we show in a highly important life decision – choosing where to go to college – a change in college names can cause people to change their behavior. This highlights the need for reliable, objective information on college quality to ensure high-quality matches between student ability and college quality, echoing similar calls from the

US, Chile, and beyond (Hastings et al., 2016; Hurwitz and Smith, 2018).

Our second contribution is to show that college name changes have self-reinforcing effects. We show that a change in a college's name immediately draws better students, which constitutes an increase in quality, given the importance of peer effects in student outcomes. We find that these gains persist over time; college name changes, therefore, lead to an apparently permanent improvement in college quality, even in the absence of a substantial change in offerings, facilities, or other fundamentals.

Our third contribution is to show that these changes generate real impacts in the labor market. Hiring professionals have much better information than college applicants, and appear to respond to only the real effects that these name changes have. These responses are consistent in magnitude with the changes we observe in student quality. Our results suggest that the provision of information about college quality may be less important for employers, who are better informed, than for college applicants.

Overall, we find that, in the absence of reliable, accessible data on college quality, college choice can be influenced at a large scale by simple changes in college names. These effects persist over time. They also impact the early labor market performance of college graduates. Together, our results show that name changes can generate self-fulfilling and self-perpetuating processes in large, highly important markets.

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Appendix

Appendix tables

Table A.1: Analysis of score changes for colleges with initially failed applications

	(1) Treatment: year of failed attempt	(2) Treatment: year of successful change
Effect on average CEE score (in SD units)	-0.001 (0.012)	0.030*** (0.011)
Number of colleges that changed names	9	9
Total number of colleges in sample	1,198	1,198
Number of observations	417,368	418,441

Note: this table shows results for estimating Equation 1 using a set of colleges whose application to change their name was initially rejected. Column 1 shows results using the year of the failed change as the treatment variable; column 2 shows results using the (later) year of successful name change as the treatment. There are fewer observations in column 1 than in column 2 because in column 1 we drop all the years in which the college had successfully changed its name. The row entitled "Effect on average CEE score" reports the results for estimating β_1 in Equation 1 for the group named in the column heading. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.2: Effect of name changes on CEE scores, using maximum CEE score among admitted students instead of average score

	(1) All name changes	(2) College to university
Effect on maximum CEE score (in SD units)	0.045***	0.066***
	(0.004)	(0.005)
Number of colleges that changed names	244	109
Total number of colleges in sample	1,198	1,198
Number of observations	351,699	351,699

Note: this table shows results analogue to those in Table 2, but using the maximum CEE score at the college–province–year–track level, instead of the average score. The results are similar across the two tables. The row entitled "Effect on average CEE score" reports the results for estimating β_1 in Equation 1 for the group named in the column heading. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.3: Effect of name changes on CEE scores, controlling for quotas

Panel A: Main effects, sample with enrollment quota data

	(1) All name changes	(2) College to university
Effect on average CEE score (in SD units)	0.067*** (0.008)	0.067*** (0.009)
Number of colleges that changed names	80	69
Total number of colleges in sample	673	673
Number of observations	147,512	147,512

Panel B: Main effects, controlling for enrollment quota

	(1) All name changes	(2) College to university
Effect on average CEE score (in SD units)	0.067*** (0.008)	0.067*** (0.009)
Number of colleges that changed names	80	69
Total number of colleges in sample	673	673
Number of observations	147,512	147,512

Note: this table shows robustness of the results in Table 2 to two alternative specifications.. Panel A shows the same specification as in Table 2, but using only colleges in the sample for whom we have data on enrollment quotas. Panel B shows a specification similar to Table 2 and Panel A of this table, but estimated including this quota variable as a control on the right hand side of equation 1. The row entitled "Effect on average CEE score" reports the results for estimating β_1 in Equation 1 for the group named in the column heading. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. These results may appear somewhat inconsistent with our results in Table 2. This is because they comprise a selected sample: a large majority of name changing colleges in this sample (69/80, or 86%) have changes which include the change from "college" to "university," whereas in the total analysis sample less than half of name changing colleges (109/244, or 45%) include the change from "college to university."

Table A.4: Heterogeneity in the effects of name changes on CEE scores by type of name change

	(1) Name change includes change from college to university	(2) Name change does not change college to university	(3) Private colleges only (all change types)
Effect on average CEE score (in SD units)	0.077***	0.036***	0.028***
	(0.004)	(0.008)	(0.004)
Number of colleges that changed names	109	19	116
Total number of colleges in sample	1,198	1,198	1,198
Number of observations	418,441	418,441	418,441

Note: in this table, we report estimates of Equation 1 estimated for three separate types of name change. In columns 1 and 2, we report results for public colleges. Column 1 reports effects for colleges whose name change includes the shift from college to university (i.e., types 1 and 4 in Table 1). Column 2 reports reports effects for colleges who changed their name without the change from college to university (types 2 and 3 in Table 1). Column 3 reports effects for private colleges, generally believed to be of lower quality, similar to those studied in Acton (2020). The row entitled "Effect on average CEE score" reports the results for estimating β_1 in Equation 1 for the group named in the column heading. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.5: Main effects, using individual-level data

	(1) All name changes	(2) College to university
Effect on average CEE score (in points)	5.868*** (1.435)	9.977*** (1.564)
Colleges that changed names	53	40
Colleges in sample	453	453
Number of observations	19,987	19,987

Note: this table shows analysis of individual-level CEE score data scraped from the websites of Chinese high schools. The estimating equation we use is $Score_{ispct} = \mu_0 + \mu_1 NewName_{ct} + \mu_2 X_i + \mu_3 Private_s + \mu_4 Tier_{ct} + \phi_c + \varphi_p + \psi_t + \varepsilon_{iscpt}$, where $Score_{ispct}$ is the CEE score for student i in high school s from province p who enrolls in college c in year t. X_i is a vector of controls at the student level (gender and track) and $Private_s$ is a dummy variable for whether the student attends a private high school. $Tier_{ct}$ is a control for the tier of the college in that year. The fixed effects ϕ_c, φ_p, and ψ_t, are at the college, province, and year level, respectively. The two estimation result columns focus on the group of college name changes as labeled in the column heading, and mirror columns 1 and 2 in Table 2. The outcome variable is in points, not standard deviations, because of the nature of the data used in this table.

Table A.6: Heterogeneity in the effects of name changes on CEE scores by college location

	Colleges in large cities		*Colleges not in large cities*	
	(1)	(2)	(3)	(4)
	All name changes	College to university	All name changes	College to university
Effect on average CEE score (in SD units)	0.030***	0.052***	0.112***	0.136***
	(0.003)	(0.004)	(0.005)	(0.007)
Colleges that changed names	163	79	81	30
Colleges in sample	763	763	435	435
Number of observations	275,819	275,819	142,622	142,622

Note: in this table, we compare effects for name changing colleges located in large cities (columns 1 and 2) to those for small and medium-sized cities (columns 3 and 4). The row entitled "Effect on average CEE score" reports the results for estimating β_1 in Equation 1 for the group named in the column heading. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

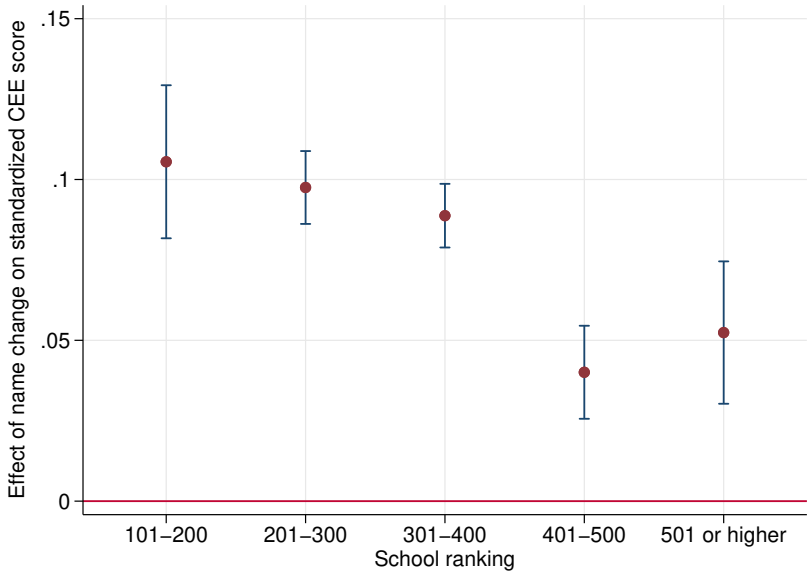
Table A.7: Colleges used in resume audit study

Number	*City where job advertised*	*College's old name*	*College's new name*	*Year name changed*
1	Hangzhou	Zhejiang Institute of Finance and Economics *Zhejiang Caijing Xueyuan*	Zhejiang University of Finance and Economics *Zhejiang Caijing Daxue*	March 2013
2	Hangzhou	Zhejiang Oceanic Institute *Zhejiang Haiyang Xueyuan*	Zhejiang Oceanic University *Zhejiang Haiyang Daxue*	January 2016
3	Hefei	Anhui Institute of the Architecture Industry *Anhui Jianzhu Gongye Xueyuan*	Anhui Architecture University *Anhui Jianzhu Daxue*	March 2013
4	Hefei	Anqing Normal (Teachers') College *Anqing Shifan Xueyuan*	Anqing Normal University *Anqing Shifan Daxue*	January 2016
5	Shanghai	Shanghai Institute of Foreign Trade *Shanghai Duiwai Maoyi Xueyuan*	Shanghai University of Foreign Trade *Shanghai Duiwai Maoyi Daxue*	March 2013
6	Shanghai	Shanghai Institute of Electrical Studies *Shanghai Dianli Xueyuan*	Shanghai University of Electrical Studies *Shanghai Dianli Daxue*	May 2018
7	Wuhan	Wuhan Institute of Industry *Wuhan Gongye Xueyuan*	Wuhan Light Industry University *Wuhan Qinggong Xueyuan*	March 2013
8	Wuhan	Hubei Normal (Teacher's) College *Hubei Shifan Xueyuan*	Hubei Normal University *Hubei Shifan Daxue*	January 2016
9	Xi'an	Xi'an Electrical Institute *Xi'an Dianli Xueyuan*	Xi'an Electrical University *Xi'an Dianli Daxue*	March 2012
10	Xi'an	Xi'an Institute of Finance and Economics *Xi'an Caijing Xueyuan*	Xi'an University of Finance and Economics *Xi'an Caijing Daxue*	May 2018
11	Zhengzhou	Northeast China Water Resources and Hydropower Institute *Huabei Shuili Shuidian Xueyuan*	Northeast China Water Resources and Hydropower University *Huabei Shuili Shuidian Daxue*	March 2013
12	Zhengzhou	Zhengzhou Institute of Light Industry *Zhengzhou Qinggongye Xueyuan*	Zhengzhou University of Light Industry *Zhengzhou Qinggongye Daxue*	May 2018

Note: This table lists the old name, new name, and year of name change for colleges used in the resume audit study. For each resume, the name in English is given in the first row, and the name in Chinese is given below in italics.

Appendix figures

Figure A.1: Heterogeneity in the effect of name changes on CEE scores by baseline college rank



Note: this figure shows the coefficient β_1 and corresponding confidence interval estimated from a version of equation 1, where the treatment variable is interacted with the five rank tranches shown on the x-axis. The estimating equation is fully saturated; in other words, the equation replaces the one "name change" treatment variable with that variable interacted with an exhaustive set of categorical variables for all possible ranking of treated colleges (no treated colleges are ranked 100 or higher).

Appendix A: College name change requirements

According to the Chinese Ministry of Education, for a college to receive permission to change its name from "college" (*xueyuan*) to "university" (*daxue*), it must meet the following series of requirements.

First, it has to meet requirements for the minimum number of enrolled students. Specifically, the number of full-time students has to be more than 8000 for the college to change its name to university (*daxue*), while the number needs only to be more than 5000 for the name "college" (*xueyuan*).

Second, there is a requirement about the minimum number of academic fields offered at the college. Specifically, the number of fields offered should be more than three out of a total of seven officially recognized fields (humanities, social science, science, engineering, agriculture, medicine, and management) for a name change to university, while the number needs only to be two or more for the college name. In addition, a college needs to have only three or more master's programs on offer for each academic field, while a university is required to have a total of more than ten offered master programs.

Third, there are requirements about faculty strength. For a college to change its name to university, more than half of faculty members are required to hold at least a master's degree and at least 20 percent are required to hold a PhD. For colleges, the proportion of master's degree-holding faculty members needs only to be 30% or greater, and there is no requirement for PhD degree holders. Furthermore, the number of full professors is required to be more than 100 for a college to change its name to university. For the college to meet basic college requirements, this needs only to be more than ten.

Fourth, there are teaching requirements. Both colleges and universities have to pass a series of regular teaching evaluations performed by China's Ministry of Education. For a college to change its name to university, the institution needs to have received three or more teaching awards at the national level if the institution is in the first or second tier, or to have received a similar number of awards at the provincial level if it is in the third tier. There were no such requirements for colleges

retaining the name "college."

Fifth, there are requirements about research productivity. For a college to change its name to university, the institution is required to have received an annual amount of research funding (30 million yuan, or roughly US $3.8 million) in the prior five years. Furthermore, to be called university, the institution needs to have received more than 20 research awards/prizes from award-granting agencies at the provincial or national level.

Sixth and finally, there are overall national requirements about the resources of the institution. The resource requirements pertain to the ratio of various measures of campus offerings - overall acreage of the campus, square footage of buildings, facilities, and library resources - relative to the number of enrolled students. There are no differences in these requirements pertaining to colleges and universities, but because the requirements about the minimum number of students differ between colleges and universities, the resources requirements could impose pressure to "upgrade" for colleges wishing to change their names to university.

Source: Ministry of Education of China. 2006. Requirements on the Qualification of Bachelor-Degree Universities (Pu Tong Ben Ke Xue Xiao She Zhi Zan Xing Gui Ding, in Chinese). Available at http://old.moe.gov.cn/publicfiles/business/htmlfiles/moe/s181/201006/88612.html. Accessed on Feb 23, 2020.

Appendix B: How academic resources and scholarly output vary with college name changes

Colleges have to apply to the Ministry of Education for approval to change their name. This process involves preparing materials to demonstrate that the college has the necessary level of resources and facilities, as described in Appendix A. We estimate whether college resources or output vary with a change in name, using data on the levels of certain college resources related to research support and productivity. We use these to study whether there are other relevant changes concurrent with the name change that might affect instructional quality or the public perception of a university.

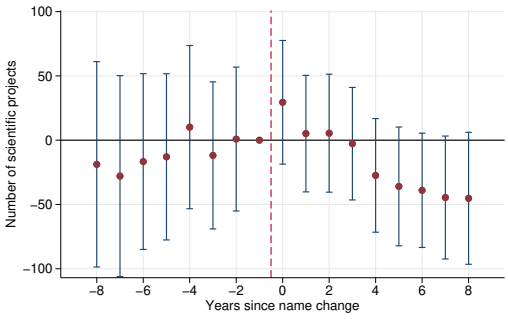
The main data we have relate to the annual scientific output of the university: the number of government funded projects it has, the amount of government funding under management, and the number of papers published by scholars at the university. We also observe the number of faculty members at the college. We have this data for a subset of our overall sample - 90% of public universities - over our period of study.

To study this relationship, we estimate a version of equation 2,

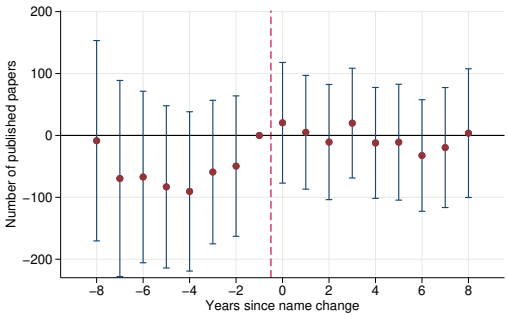
$$y_{cpstr} = \delta_0 + \sum_{T=-9}^{9} \delta_1 NewName_{Tct} + \theta_{es,c} + \mu_{es,t} + \varepsilon_{cpst} \tag{4}$$

We use outcome variables at the college-by-year level; as a result, we control for only college ($\theta_{es,c}$) and year ($\mu_{es,t}$) fixed effects, with the *es* subscript standing for "event study." We report our estimates in Figure A.2 (similar to Figure 2). We see that scientific funding and number of funded projects display no obvious difference before and after the name change. The number of faculty (and, perhaps, the number of published papers) appears to ramp up in the two to three years *before* the name change, and then stays around this level thereafter. Overall, these patterns are consistent with our interpretation that little changes about these universities in the year of a name change. In Table A.8, we show that our main results are robust to restricting the sample to colleges for whom we have resource data, and to adding controls for these levels of resources.

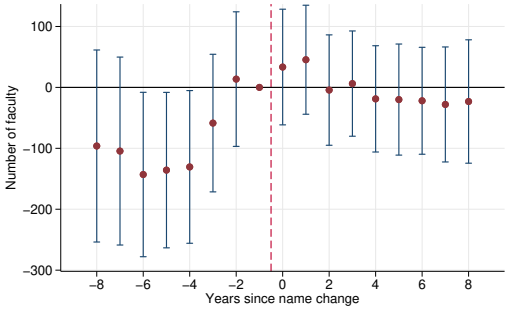
Figure A.2: How resources change with college name changes



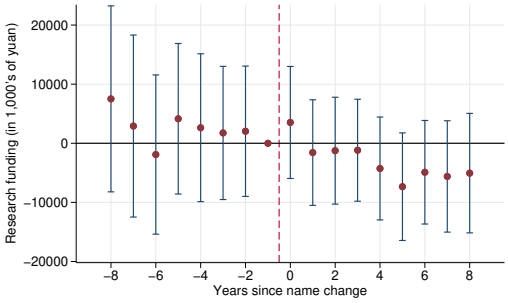
Panel A: Number of scientific projects



Panel B: Number of papers published



Panel C: Number of faculty



Panel D: Overall research funding

Note: this figure shows event studies, similar to Figure 2, only showing the estimated impact of college name changes on the college resources described in the panel title and the y-axis of the figure.

Table A.8: Main effects, controlling for resources

Panel A: Main effects, sample with resources data

	(1) All name changes	(2) College to university
Effect on average CEE score (in SD units)	0.080***	0.090***
	(0.004)	(0.004)
Number of colleges that changed names	175	97
Total number of colleges in sample	954	954
Number of observations	269,522	269,522

Panel B: Main effects, controlling for resources

	(1) All name changes	(2) College to university
Effect on average CEE score (in SD units)	0.088***	0.096***
	(0.004)	(0.004)
Number of colleges that changed names	175	97
Total number of colleges in sample	954	954
Number of observations	269,522	269,522

Note: this table shows robustness of the results in Table 2 to two alternative specifications. Panel A shows the same specification as in Table 2, but using only colleges in the sample for whom we have resources data, that is, annual data on the number of federal projects, the amount of research funding currently under management by the college, and the number of papers published. Panel B shows a specification similar to Table 2 and Panel A of this table, but estimated including these three "resource" variables as controls on the right hand side of Equation 1.

Appendix C: College name changes in the US

In this appendix, we briefly discuss the history of college name changes in the US. We do not try to make a claim about our estimates' generalizability to the US context; rather, we use this appendix to highlight that this phenomenon is common even in more mature markets for higher education such as that in the US.

College name changes have been happening in the US for quite some time

The phenomenon we study, colleges changing their name to signal higher quality, is one that occurred commonly among US colleges as early in the nation's history as the first half of the 19th century. Platt et al. (2017). provide an exhaustive study of the history of this process. In Figure 1 of their paper, they document that by 1830, over 50 colleges per decade were changing their name in this way. For example, Queen's College became Rutgers College in 1825, and The College of New Jersey changed its name to Princeton University in 1896.

College name changes are still a feature of the US higher education landscape

Platt et al. (2017) report that there were also hundreds of these changes which took place in the US over the last century. Even today, such name changes continue, particularly at the lower end of the selectivity spectrum (Acton, 2020). In 2015, an Associated Press documented that name changes were common among "colleges looking to gain prestige along with more students and precious out-of-state tuition dollars" (Associated Press, 2015). A US News study documented that hundreds of such name changes occurred between 1996 and 2009, though primarily among the least selective institutions (Clark, 2009).

The reasons for these changes in the US are similar to what we document for China

These name changes often involved the switch from the name "college" to the name "university" in order to signal quality: *"Many 'colleges' have been relabeled as 'universities' to attract larger enrollments via perceived legitimacy as it has been found that the term "university" carries more*

academic weight with the public than 'college'" (Troop, 2008). A more recent report in the Boston Globe claims that these changes often occur with very little else changing about the institution (Belman, 2017). Academic study of this phenomenon corroborates these claims. Owston (2009) uses a mixed-methods approach to study 51 re-branding efforts among colleges in Appalachia between 1996 and 2005, the majority of which were simple replacements of the word "college" with the word "university." That study found that these changes were made because they were expected to "produce greater prestige and increased enrollment" for the institution (ibid.). For good studies of the US context, see Clinton (2020), who studies the employment effects of name changes on students already enrolled in colleges at the time of the name change, and Acton (2020), who uses an event-study design to study, within-colleges, how name changes affect recruitment at primarily lower-ranked private institutions in the US.

Appendix D: Details of HR survey

Our HR survey consisted of 21 questions - 18 multiple choice, and three mixed: a multiple choice question followed by a free-response blank asking the respondent to explain their choice. To find participants, we used the professional network of one of our research assistants, a part-time MBA student who had worked as a HR professional. We sent the survey via the online messaging service *WeChat*, offering a gift card worth 2-10 yuan ($0.30-$1.50) as a gesture of gratitude. We sent the invitation out to 147 individuals and use data from the 87 HR professionals who responded.

These survey data contain a few key messages. First, we asked them: "if, in the process of looking through resumes, you find a college you are unfamiliar with, how would you deal with this?" Eighty-two of the 87 respondents reported that, in such a situation, they would look up the college online or ask a colleague about the college. Second, we learned that the majority of these professionals were aware of the college name change phenomenon we study: eighty-four claimed to be somewhat or very familiar with the phenomenon of college name changes. Together, these patterns corroborate our assumption that HR professionals are relatively well informed. We also learned that these individuals thought that name changes would attract better students (53 of the 87 respondents) and that new names would help graduates on the job market (82 of 87 respondents).

The final two questions in the survey asked respondents the following hypothetical question - for each of two job types (programmer and administrative professional), if the person encountered two applicants who were observationally similar, but one listed the "college" version of a given college's name, and the other listed the "university" version, which they would hire, and why? For the hypothetical situation of choosing a "college" graduate over a "university" graduate, the respondents suggested that the applicants listing the university name might be overqualified for the position, leading to dissatisfaction and possible loss of the employee after a short period of time on the job.

Appendix E: Analysis of Chinese civil service exam data

In this appendix we use ancillary data to explore, observationally, whether students graduating from a given college after its name changes possess different skills than those who graduate from the same college before the change. To do so, we use person-level administrative data from China's civil service examination. Applicants to the Chinese civil service first complete an online application form and then sit for an annually held written exam. This written exam comprises two sections - a test of "administrative skill," comprising largely multiple choice questions testing knowledge of arithmetic, the law, and decorum, and an essay prompt asking the respondent to design and describe a plan to address a hypothetical issue that might arise in the course of working for the civil service. Each year, all applicants in a given province take the same version of this written test.

We have administrative, individual-level data from over 53,000 test takers in 30 cities over six years. This data comprises applicants' gender, their scores on the test - both overall, and the multiple choice and essay sections separately - and the name of the college from which they received their degree. We use this to conduct a simple descriptive analysis, estimating whether individuals graduating from a given college after it changes its name perform differently than individuals graduating from that same college in the years before the name change.

We implement this using a simple difference-in-differences style estimating equation:

$$Score_{iltc} = \delta_0 + \delta_1 NewName_i + \delta_2 Male_i + \delta_3 \vartheta_{lt} + \delta_4 \theta_c + \varepsilon_{iltc} \tag{5}$$

This regresses the score of individual i in locality l at year t and college c on a constant, whether they graduated after a name change occurred, their gender, a locality-year fixed effect ϑ_{lt}, and a college fixed effect θ_c. We standardize the test scores to the city-by-year level. The main coefficient of interest is δ_1, which estimates whether applicants from graduating from a given college post-name change perform any better than applicants graduating from that same college before the name change.

This estimate is only suggestive. Who takes the civil servant exam in a given year is endoge-

Table A.9: Civil servant exam scores and college name changes

	(1) Overall test score	(2) Administrative skill score	(3) Government writing score
Graduated from college after name change	0.075** (0.035)	0.023 (0.035)	0.070** (0.035)
Number of observations	53,247	53,247	53,247

Note: this table shows results from estimating Equation 5 with the outcome being the civil servant exam test score described in the column heading. Each of these scores is standardized at the city-year level. Because different cities use different weightings of the essay and administrative skill scores to generate the overall test scores, and because we standardize the three test scores separately, the overall test score estimate is not a weighted average of the other two sub-test estimates.

nous, with individuals selecting in based on their current labor market prospects and interests. Nonetheless, the parameter is equivalent to what government hiring professionals observe regarding the association between college name changes and candidate quality.

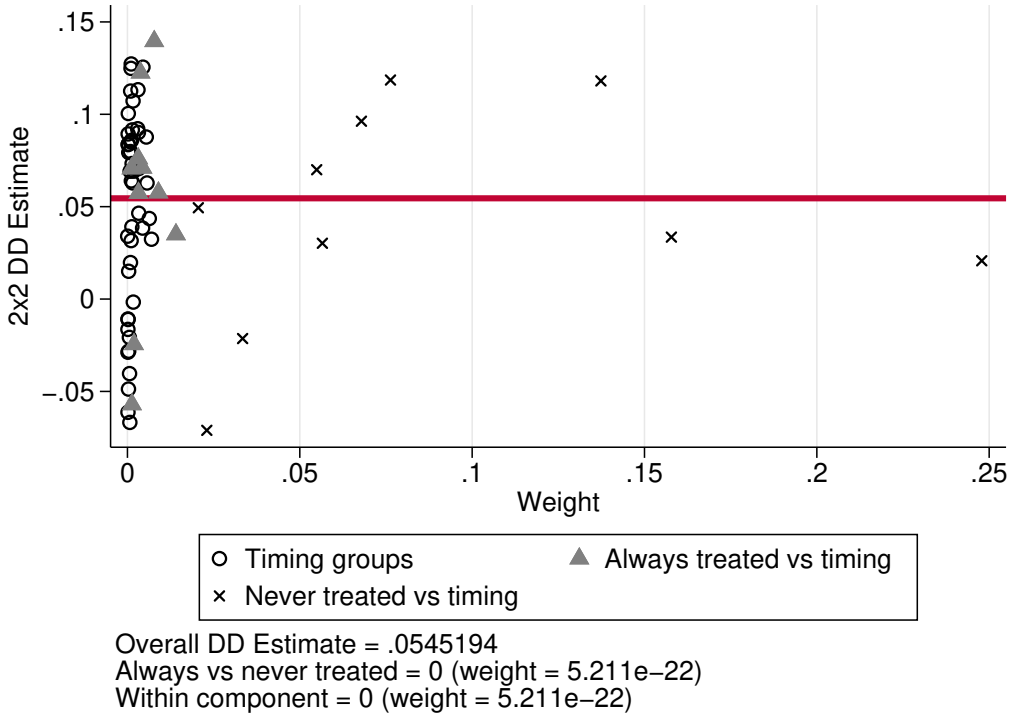
We show our results in Table A.9. For all sections of the exam, the mean score of applicants listing the college's new name is higher than for applicants listing the old name. For both the overall score and the essay score, this difference is statistically significant. This suggests that, at least to government employers, college name changes are associated with observable differences in applicant quality. This is consistent with the results in Section 4 showing that college name changes were successful in attracting students with higher CEE scores.

Appendix F: Testing for negative weights in ATE estimates from DiD strategy

Goodman-Bacon (2019) studies the properties of difference-in-difference estimators, bringing attention to the fact that the overall estimand from a difference-in-difference analysis of a policy or experiment with staggered timing of implementation is a weighted average of four types of potential estimands: one, the never treated vs. those treated "early"; two, the never treated vs. those treated "late"; three, those treated early vs. those treated late as compared in the early period, in which the late-treated serve as controls when estimating the effect on the early-treated; and four, those treated early vs. those treated late as compared in the late period, in which the early-treated serve as controls when estimating the effect on the late-treated.

One important concern that rises out of this analysis is the potential for negative weights on certain estimates to bias the overall treatment effect. In Figure A.3, we show the estimates and weights of all the different cells, calculated using the Stata command *bacondecomp*. This analysis shows two main features of our analysis: one, as in Carey et al. (2020), the largest weights are exclusively from the comparison of the never-treated and the treated. Two, there are no estimates with visibly negative weights. Using the method of de Chaisemartin and d'Haultfoeuille (2020), we can calculate the total number of negative weights using the entire sample. This shows that 15% of the weights in the full sample are negative, but the sum of the negative weights is only -0.036, more than an order of magnitude smaller than the cases that paper identifies as problematic. Overall, we conclude from this analysis that the problem of negative weights described in Goodman-Bacon (2019), Callaway and Sant'Anna (2019), and de Chaisemartin and d'Haultfoeuille (2020), driven by heterogeneity across time in the treatment effect and composition of the treated and control groups, does not appear to bias our estimates.

Figure A.3: Estimates and weights of our DiD analysis



Note: this figure shows the estimates and their respective weights for our main analysis, using the Stata command *bacondecomp*. Note that this analysis requires a balanced panel for implementation. As a result, we drop more than half of our observations, as many colleges lack data in one or two years. Nonetheless, the overall estimate of 0.055 is very similar to the estimate of 0.057 in our main analysis, shown in Table 2.