PARTIAL COMPLIANCE WITH AFFIRMATIVE ACTION BANS: EVIDENCE FROM UNIVERSITY OF CALIFORNIA ADMISSIONS

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Abstract

Even under an affirmative action ban, there remains scope for universities to offer minority applicants less overt admission preferences since such practices would be difficult to detect. This paper finds that the majority of University of California campuses reduced, though did not fully eliminate, the use of admission preferences for minority applicants after California's ban on affirmative action. By comparing estimates from alternative fixed effect strategies for dealing with applicant unobservables, the paper also demonstrates how one can effectively sign the bias of OLS estimates of minority admission preferences. These results suggest that OLS estimates are likely to be downward biased.

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1. Introduction

There is a large literature on the potential impacts of affirmative action bans on the college choices of high school students and on the composition of college student bodies. Much of this work presupposes that such bans act as fully binding constraints on the behavior of college admission officers. However even under an affirmative action ban, there remains scope for universities to offer minority applicants less overt admission preferences since such practices would be difficult to detect given the general lack of transparency in the college admissions process. This is one of the few empirical papers to attempt to gauge the compliance of university admission offices with such laws.

Specifically, I look at the response of the eight undergraduate campuses of the University of California (UC) to the passage of Proposition 209 in 1996.[1] Proposition 209 amended the constitution of California to prohibit state institutions (including public universities) from discriminating against or granting preferential treatment to individuals on the basis of race, sex, or ethnicity. Just prior to the law change, the UC Board of Regents adopted Regents Resolution SP-1, which specifically prohibited the use of preferences based on race or ethnicity in the admissions decision process. Both the constitutional affirmative action ban and resolution SP-1 went into effect for the 1998 entering class.

However, the UC Board of Regents soon reversed course and rescinded resolution SP-1 in 2001 because of concern that the ban on affirmative action had caused prospective students to perceive the University as inhospitable to minorities. The UC Board of Regents acknowledged that the University remained governed by Proposition 209. At the same time, it initiated a

[1] Merced became the ninth undergraduate UC campus in 2005.

number of admission policy changes aimed at promoting student diversity.[2] Regardless of the stated commitment of the UC governing boards to abide by the constitutional affirmative action ban, there is a question to what extent admission officers and application readers adopted truly color-blind practices in how they evaluated individual applications after Proposition 209 came into effect.[3]

Demonstrating that discrimination based on race or ethnicity has occurred is very challenging. The key concern is that any observed differences between minority and non-minority outcomes may be the result of differences in unobserved characteristics across the two groups instead of being due to discrimination. Researchers are increasingly turning to field experimental methods, such as audit and correspondence studies, to identify labor market discrimination. Such methods would appear to be particularly impractical and/or unethical for the purposes of examining how universities consider race and ethnicity in admissions. Instead, I take advantage of the fact that high school students often send out applications to multiple universities that use admission preferences to varying degrees. Following Dale and Krueger (2002), I use information on the set of schools to which high school students sent applications to account for differences in applicant unobservables. Alternatively, I use individual applicant fixed effects to account for student characteristics correlated with both the likelihood of admission and minority status. I show that by comparing the results from these alternative strategies for dealing

[2] This included the introduction of Eligibility in the Local Context (ELC) , which guaranteed admission to one of the UC campuses (though not necessarily the campus of choice) to all California students in the top 4 percent of their high school class. The UC Board of Admissions and Relations with Schools (BOARS) also pushed individual campuses to institute a system of comprehensive review of undergraduate candidates for admission. UC campuses had previously used tiered admissions, with UC campuses typically admitting between 50 and 75 percent of their freshman classes solely based on academic criteria. Comprehensive review aimed to continue emphasizing academic achievement as the most important of the admission decision, while also directing admission officers to contextualize achievement based on each applicant's opportunities.

[3] While application materials may have been devoid of direct indicators of race or ethnicity, reviewers, in theory, could infer the minority status of an applicant from other information provided (such as the applicant's essay).

with applicant unobservables, one can effectively sign the bias of OLS estimates.

I find that the great majority of the UC campuses offered admission preferences to minority applicants both before and after Proposition 209 came into effect, with the largest preferences typically offered by the more selective campuses. Estimated admission preferences for UC minority applicants are smaller after the ban on affirmative action in California, though in many instances they remain sizable. Results from specifications that try to account for applicant unobservables suggest that OLS estimates of minority admission preferences are likely to be downward biased. Overall, these results suggest that affirmative action continued to be in practice, though to a more limited degree, at the University of California even after it had been banned.

2. Relation to Previous Research

The theoretical literature on affirmative action bans tends to assume that such bans act as fully binding constraints on the behavior of universities (Chan and Eyster, 2003; Fryer, Loury, and Yuret, 2007; Epple, Romano, and Sieg, 2008). To the extent that universities care about diversity, the expectation is that they will try to lessen the impact of affirmative action bans by shifting to "color-blind" affirmative action policies that are fully compliant with the letter of the law. For example, an admissions office might change its admission rule to put greater weight on non-racial, non-academic characteristics of prospective students (where such characteristics imperfectly proxy for race and ethnicity). Universities might also change the relative weights on different academic qualifications to the benefit of minority applicants. Antonovics and Backes (2013) find that the University of California changed the admission weights given to SAT scores,

high school GPA, and family background in ways that benefited minority admission rates in response to California's affirmative action ban.

This paper examines whether the University of California also continued with less overt "color-sighted" affirmative action policies in response to Proposition 209. Because the admissions process is typically not very transparent, the cost to the state of monitoring and enforcing university affirmative action bans is likely to be high. As a result, a university might instead chose to respond to a ban by only lessening the severity of its affirmative action admission policies to levels that are unlikely to be detected. Long and Tienda (2008) find that the University of Texas at Austin, Texas A&M University, and Texas Tech University complied with the Hopwood ruling such that direct advantages given to minority undergraduate applicants disappeared during the judicial affirmative action ban in Texas.

Conversely, Yagan (2013) finds that minority applicants to the UCLA and Berkeley law schools continued to receive admission preferences even after the passage of the affirmative action ban in California. Because Yagan's analysis encompasses all law school applicants who attend a single elite undergraduate program, he is able to control for selective attrition from the applicant pool to the UC flagship law schools after the passage of Proposition 209. I am unable to control for this form of selection, which limits the ability of this paper to identify the causal effect of Proposition 209 on UC admission decisions. However, I am able to gauge compliance with the affirmative action ban at each individual UC campus, including all of the non-flagship campuses. The data used in my analysis also covers all UC undergraduate applicants. Like Yagan, I find that almost all of the UC campuses maintained some form of admission preferences for minority undergraduate applicants even after California's ban on affirmative action.

Finally, the results of this paper are potentially useful for interpreting the results of research that has focused on the impacts of affirmative action bans on high school and college student outcomes. A number of studies have looked at how affirmative action bans have influenced student decision making at each of the different stages of college choice (Dickson, 2006; Long, 2004; Card and Krueger, 2005; Hinrichs, 2012; Antonovics and Sander, 2013), as well as subsequent college outcomes (Arcidiacono et al., 2012). Impacts on student outcomes are likely to depend, at least in part, on how faithfully universities comply with such bans.

3. Data

I use public-use, administrative data from the University of California Office of the President (UCOP) on freshman applicants for the period between 1995 and 2006. The data identifies to which UC campuses a student applied, which campuses admitted the student, and whether (and where) the student enrolled. It also includes information on each student's planned field of study and a range of information about high school and standardized test performance. Finally, this dataset includes information on college grades and graduation outcomes for UC enrollees.

UCOP collapsed information on applicant characteristics in a variety of ways because of privacy concerns. Most importantly for the purposes of this study, the data does not distinguish between black and Hispanic applicants. In estimating admission preferences for minority applicants, I am thus not able to produce direct evidence on how admission policies may have varied towards these distinct racial/ethnic groups. However, the data does include information on which elective SAT II subject tests applicants submitted scores for the post-Proposition 209

period. Minority applicants disproportionately submitted Spanish language test scores and disproportionately reported high scores (i.e. 700 or above) in that subject both relative to non-minorities and relative to all other subjects. Since this tendency is likely indicative of Hispanic heritage, I am able to use information on SAT II subject scores to look indirectly at how admission policies towards blacks and Hispanics may have varied.

Another potential concern with the original UCOP data is that SAT scores and high school grades are reported as ranges. If there is a significant and systematic disparity between average minority and non-minority scores (grades) within the reported ranges, this would possibly bias any estimates of admission preferences. I take a number of steps to minimize the potential impact of this form of measurement error. For high school GPA and SAT I verbal and math scores, I am able to impute very precise measures using the method outlined by Luppino and Sander (2013).[4] For SAT II writing scores, I assign to applicants the mean score within their reported range where I assume that scores are approximately normally distributed. To parameterize the normal distribution that corresponds to each applicant, I estimate interval regressions separately by minority status and for each period. These estimates are reported in **Table A.1**. Because I conduct separate analyses for each UC campus, I allow the mean of SAT II writing scores to vary depending on the set of campuses to which a given applicant sent applications.

Finally, the data groups applicants into three-year periods. The data includes the period (1995-1997) immediately prior to the passage of Proposition 209, as well as the three subsequent three-year periods (1998-2000, 2001-2003, and 2004-2006). I have restricted the sample to

[4] This method takes advantage of the inclusion of an exact academic index score in the data, which UCOP constructed as a linear combination of each student's high school GPA, SAT I verbal, and SAT I math scores based on pre-assigned weights.

applicants that are not missing information on high school grades, SAT I scores, SAT II writing score, and the admission outcome. Admission rates for minority and non-minority applicants for each of the UC campuses are presented in **Table 1**.

After Proposition 209 became law, the admission rates of minority applicants fell substantially at all of the UC campuses (with the exception of Riverside). However, not all of this decline is necessarily attributable to the law change. It would appear that UC admissions became generally more selective over this period, as evidenced by similar (though smaller) declines in non-minority acceptance rates. The last column of Table 1 presents unconditional difference-in-difference estimates that net out the general (non-minority) trend from the change in minority admission rates.

One should be extremely skeptical of interpreting the difference-in-difference estimates reported in Table 1 as causal estimates of the effect of the UC affirmative action ban on minority acceptance rates. These estimates also likely reflect changes in the composition of both the minority and non-minority high school students who applied to the University of California. For example, the minority/non-minority gap in applicant high school grades narrowed slightly at all of the UC campuses after the passage of Proposition 209. Conversely, the gap in SAT test scores tended to increase somewhat. **Table A.2** presents detailed information on how the observable characteristics of these two applicant pools varied before and after the UC affirmative action ban. It is also likely that the unobservable characteristics of UC applicants changed over this period.[5]

In order to estimate the causal effect of Proposition 209 on UC admission policies, one would need to account for the differential selection of high school students into the UC applicant

[5] Dickson (2006) finds that fewer minority high school students took the SAT after the judicial affirmative action ban in Texas. Long (2004) and Card and Krueger (2005) find mixed evidence on how the affirmative action bans in California and Texas affected the SAT score-sending behavior of minorities relative to non-minorities.

pool before and after the law change. My analysis eschews this lofty goal and, instead, aims to identify to what extent admission officers complied with the affirmative action ban.

4. Empirical Strategy

Consider the following admission decision rule for campus *c* in period *t*:

$$Y_{igct} = \pi_{ct} urm_{it} + X'_{it}\beta_{ct} + \gamma_{ct} Z_{igt} + \varepsilon_{igct} \quad \text{(i)}$$

Whether applicant *i* is admitted (*Y*=1) depends on the weight (β, γ) that the admission committee places on observed applicant characteristics *X* (such as high school grades and test scores) and unobserved ability *Z* (which the admission committee evaluates by reviewing additional application information such as student essays, records of extracurricular activities, etc.).[6] The final admission decision also depends on some degree of randomness (represented by the exogenous shock ε).

The committee may additionally give the applicant an admission preference (π) if she is an under-represented minority (*urm*=1). An OLS estimate of the admission preference would potentially suffer from omitted variable bias to the extent that average levels of unobserved ability varied between minority and non-minority applicants:

$$\hat{\pi}_{ct}^{OLS} = \pi_{ct} + \underbrace{\gamma_{ct}(\bar{Z}_{ct}^{(urm)} - \bar{Z}_{ct}^{(non)})}_{\text{OLS bias}} \quad \text{(ii)}$$

The typical concern is that minorities have lower levels of unobserved skills and that, therefore, OLS estimates may overstate the extent of discrimination in the labor market. If minority

[6] Here unobserved ability is treated as a scalar index defined such that $Z \geq 0$ and $\gamma \geq 0$.

college applicants similarly have deficits in unobserved skills, we would expect OLS estimates to understate the admission preferences used by universities.

It is important to note that college admission committees may have compelling (and non-raced based) reasons to value unobserved skills differently than the labor market. For example, the university may have an interest in balancing course enrollment across disciplines or in promoting certain non-academic activities (such as the arts or athletics). As a result, the admission committee may especially value a student with preferences and abilities suited to a particular major or extracurricular activity (even when the student's expected labor market return to the pursuit is low). Therefore, it may not be safe to assume that minorities have deficits in unobserved skills as they relate to admissions. If minorities instead have higher levels of admission-specific unobserved skills, we would expect OLS to overestimate the admission preferences used by universities.

One potential way to account for the influence of unobserved ability on the likelihood of admission is to use Dale and Krueger type fixed effects that group high school students into applicant groups (g) based on the set of schools (A_g) to which students in the group apply.[7] The estimator of admission preferences where I additionally account for Dale and Krueger (DK) type fixed effects can be characterized as follows:

$$\hat{\pi}_{ct}^{DK} = \pi_{ct} + bias_{ct}^{OLS} + \gamma_{ct} \sum_{g=1}^{G} (W_{gct}^{(non)} - W_{gct}^{(urm)}) \bar{Z}_{gt} \qquad \text{(iii)}$$

W reflects the share of applicants to a specific campus, in a given time period, and of the same minority status (m) that fall into a particular applicant group, where:

[7] For example, students that only apply to Berkeley are classified into a distinct applicant group compared to students that apply to both Berkeley and Davis.

$$\sum_{g=1}^{G} W_{gct}^{(m)} = 1, \forall c, t, m \in [non, urm] \quad \text{(iv)}$$

The rationale for using this estimator is that if minority applicants have higher (lower) unobserved skills on average, one might expect them to be disproportionately overrepresented in applicant groups with higher (lower) average levels of unobservables. The DK estimator leads to an unbiased estimate of admission preferences if the third term in equation (iii) is equal to the negative of the OLS bias.

A concern with using DK-type fixed effects to estimate admission preferences is that they might exacerbate the bias of OLS. For example, take the case where universities that attract applicants with higher average levels of unobserved skills also offer larger minority admission preferences. Even if minority applicants had lower unobserved skills on average, racial admission preferences might be substantial enough to incentivize minorities to apply disproportionately to schools that are more selective. Under this scenario, it would be possible for both the OLS bias and the third term in equation (iii) to be negative.

An alternative strategy to account for unobserved ability is to jointly estimate the admission rules of all UC campuses and allow for individual applicant fixed effects (FE). Because pooling applications creates an unbalanced panel (i.e. not all applicants apply to all schools), individual applicant fixed effects also depend on the set of schools to which an applicant applies. In order to facilitate comparison with the DK estimator, the FE estimator of admission preferences can be characterized as follows:

$$\hat{\pi}_{ct}^{FE} = \pi_{ct} + (1-\alpha_{ct}) bias_{ct}^{OLS} + \overline{Z}_{ct}^{(urm)} \sum_{g=1}^{G} (W_{gct}^{(non)} - W_{gct}^{(urm)}) \overline{\gamma}_{gt} \quad \text{(v)}$$

where:

$$\overline{\gamma}_{gt} = \frac{\sum_{c=1}^{C} \gamma_{ct} 1(c \in A_g)}{\sum_{c=1}^{C} 1(c \in A_g)} \quad \text{(vi)}$$

and:

$$\alpha_{ct} = \frac{1}{\gamma_{ct}} \sum_{g=1}^{G} W_{gct}^{(non)} \overline{\gamma}_{gt} \quad \text{(vii)}$$

The FE estimator leads to unbiased estimates of admission preferences if γ is constant across campuses.[8]

A limitation of the FE estimator is that one is unable to directly estimate admission preferences for each school and, instead, must estimate admission preferences relative to a baseline (omitted) school ($p_{ct} = \pi_{ct} - \pi_{0t}$). In the analysis that follows, I select Riverside as the baseline school. Since it is the least selective in terms of admissions, one would expect racial admission preferences to be the smallest at Riverside. Therefore, selecting Riverside as the omitted school should minimize the difference between the relative admission preferences that I am able to estimate and the absolute admission preferences that I would like to estimate.

Even if DK and FE estimators produce estimates that are not truly unbiased, they potentially provide sufficient information to sign the bias of OLS estimates of admission preferences. Comparing OLS and DK estimates of absolute admission preferences tells us the sign of the third term in equation (iii) for each UC campus. As long as students with higher levels of unobserved skill are more likely to apply to schools that put greater weight on unobserved skill on average, it should hold that the third terms in both equations (iii) and (v)

[8] Both π and β are allowed to vary by campus.

have the same sign. Given that α is positive in equation (v), one would be able to effectively sign the OLS bias if one were able to observe that ($\hat{\pi}_{ct}^{FE} - \hat{\pi}_{ct}^{OLS}$) and ($\hat{\pi}_{ct}^{DK} - \hat{\pi}_{ct}^{OLS}$) had opposite signs. Under such circumstances, FE estimates would suggest that the DK estimator exacerbates the OLS bias. In discussing the results of my analysis, I show that this basic intuition holds when one compares ($\hat{p}_{ct}^{FE} - \hat{p}_{ct}^{OLS}$) and ($\hat{p}_{ct}^{DK} - \hat{p}_{ct}^{OLS}$).

5. Results

I begin by estimating the minority/non-minority admissions gap at each of the UC campuses controlling for applicant observable characteristics. **Table 2** presents results for both before and after the passage of Proposition 209.[9] In the three-year period before the affirmative action ban came into effect, I find that minorities had a higher probability of being admitted than non-minority applicants with similar observable characteristics at each of the UC campuses. The campuses are ordered in Table 2 based on the 1995 US News and World Report college rankings, where Berkeley is the highest ranked and Riverside the lowest ranked of the UC campuses nationally. Admission gaps are generally larger for higher ranked schools.

The magnitude of these gaps is comparable to those found by Long and Tienda. In the period before the Hopwood decision banned the use of affirmative action in Texas, Long and Tienda find that Hispanic and black students outside the top 10 percent of their high school class were around 30 percentage points more likely to be admitted to either of Texas' flagship universities than non-Hispanic Whites with similar observable characteristics. At Berkeley (UCLA), I find that minority applicants were 45 (38) percentage points more likely to be

[9] All specifications include controls for high school GPA, SAT I math and verbal scores, SAT II writing score, intended major, parental education, and family income.

admitted than observably similar non-minorities.[10] Berkeley and UCLA are considered more selective schools than those evaluated by Long and Tienda, which could explain the larger admission gaps observed at those campuses. At Davis and San Diego, which are more comparable in terms of national rankings to the University of Texas at Austin and Texas A&M University, I find admission gaps that are very similar in magnitude.

In the period after Proposition 209 banned the use of affirmative action in admissions, I find smaller, though still sizable, admission gaps between minority and non-minority applicants with similarly observable characteristics.[11] These gaps also persist more than six years after the new law came into effect. If one were to interpret these gaps as minority admission preferences, then my estimates suggest that even by 2004-06 a non-minority applicant would have had to score 0.86 of a standard deviation higher on the combined SAT to have had the same chance of gaining admission to Berkeley as a minority student with otherwise similar observables. In contrast, Long and Tienda find that only a relatively small admission rate gap persisted at the University of Texas at Austin after the Hopwood Decision banned the use of affirmative action in admissions. At Texas A&M University, these authors find no statistical difference in the admission rates of comparable minority and White applicants during the judicial affirmative action ban in Texas.

These results are at least suggestive that admission officers at the UC campuses failed to comply fully with Proposition 209. However, they could instead merely reflect that minority

[10] The results are similar if I instead estimate minority admission gaps relative to white applicants.

[11] One should take caution in trying to interpret trends by comparing admission gap estimates from different time periods because the nature of any omitted variable bias is likely to be changing over time. Specifically, the composition of the applicant pool is changing over time particularly in response to the passage of Proposition 209 (which might change the minority/minority gap in unobserved skills). Additionally, the UC campuses may have changed the weight placed on unobserved ability in making their admission decisions.

applicants had higher levels of admission-specific unobserved skills. In order to rule out this alternate hypothesis, I proceed by presenting indirect evidence that the estimated admission gaps are indicative of the use of racial/ethnic admission preferences and not of gaps in unobserved skills.

One possibility is that minority applicants on average have higher unobserved general academic ability and that estimated minority/non-minority admission gaps are reflective of this type of skill gap. In order to test this possibility, I look at the disparities in college outcomes of minority and non-minority applicants that eventually enrolled at any one of the UC campuses. I condition on the same set of observable characteristics that I used as controls when estimating admission gaps and additionally include enrollment campus fixed effects to account for varying academic standards across campuses. These results are presented in **Table 3**. If minorities have higher unobserved general academic ability then we would expect to find positive residual disparities in college outcomes between minority and non-minority students. Instead, I find minority students earn worse grades and graduate less frequently than non-minority applicants with similar observables.

A potential concern with this type of analysis is that the subset of applicants that eventually enrolled at the University of California may not be representative of the full set of UC applicants. In particular, this selected sample may produce a skewed picture of the minority/non-minority unobserved skill gap relative to what one might find conducting a similar analysis over the entire applicant pool. **Table A.3** presents estimates of minority/non-minority admission rate gaps restricting the sample to eventually UC enrollees. Estimated admission rate gaps for this subsample are smaller, but still positive and statistically significant for all campuses except

Riverside in all the periods observed in the data. Therefore, at least for this selected sample, I find disparities in admissions and college outcomes that are consistent with the continued use of more limited affirmative action at the University of California post-Proposition 209.

It is important to note that racial/ethnic disparities in college outcomes could result even in instances where minority applicants do not receive admission preferences. For example, it could be the case that minority students have worse college outcomes because they experience some form of discrimination after enrollment instead of there being any deficit in the unobserved skills considered for admissions. Alternatively, minorities may disproportionately select into pursuing majors that are more challenging. Differences in major preferences (and related major-specific skills), therefore, might account for minority applicants experiencing higher admission rates and seemingly worse college outcomes.

While I do control for broadly defined intended major and for SAT I math and verbal scores separately (which are at least somewhat indicative of major-specific skills), these controls may not be detailed enough to sufficiently account for the influence of major-specific preferences and skills on the admission decision. To explore further this possibility, I take advantage of information on the elective SAT II subject test reported by applicants. I collapse elective SAT II subjects into the following categories: no elective test reported, literature, US or world history, math or physics, biology or chemistry, Asian foreign language, Spanish foreign language, and other foreign language.[12] I also categorize students as high scorers if their

[12] I create separate categories for Asian and Spanish foreign languages because the University of California attracts a large proportion of Asian and Hispanic applicants for whom these are likely to be native languages. Asian foreign languages include Chinese, Japanese, and Korean. Other foreign languages include French, German, Italian, Latin, and Modern Hebrew.

reported SAT II subject test score is 700 or above.[13] I then fully interact the information on subject and high scorer status to produce elective SAT II subject fixed effects, where I designate Spanish/non-high scorer as the omitted category. **Table 4** reports estimates of the conditional minority/non-minority admission rate gap when one additionally controls for elective SAT II subject fixed effects. Even with this additional set of controls, minority applicants are more likely to be admitted to each of the UC campus in the post-Proposition 209 period compared to non-minorities with similar observable characteristics.

The way that I have coded the elective SAT II subject fixed effects is also useful for indirectly looking at how admission policies towards black and Hispanic applicants may have varied. As noted previously, minority applicants disproportionately submitted Spanish language test scores and disproportionately reported high scores with this tendency likely indicative of Hispanic heritage. In Table 4, I also report estimates from admission models that additionally include an interaction term between minority status and whether a prospective student reported a high Spanish SAT II score on her application. One can interpret the coefficient estimate for this interaction term as the difference in admission preferences given to Spanish speaking (likely Hispanic) and non-Spanish speaking (likely black) applicants. At Berkeley, UCLA, and UC San Diego, the interaction between minority status and high Spanish score is negative and statistically significant in all periods. This suggests that these campuses offered larger admission preferences to blacks than Hispanics after Proposition 209 came into effect.

It is important to note that one can alternatively interpret the coefficient of this interaction

[13] Elective SAT II subject test scores are reported categorically, with 700 or above as the top category. I use the highest test score threshold available in the data to distinguish success on the test since students selectively choose which elective subjects to take.

term as evidence of differing Spanish ability between minority and non-minority applicants with high SAT II Spanish test scores. Hispanic applicants are almost certainly more likely than non-minorities to be native Spanish speakers. Therefore, one might expect Hispanic applicants to have higher scores on average even within the top range of scores or to have greater Spanish fluency than non-minorities with similar scores.

In order to gauge the plausibility of this alternative interpretation, we can compare the marginal increases in admission likelihood between reporting a low and high Spanish score and between reporting a high Spanish score and possibly being a native speaker. At UC Davis in the 2004-2006 period, my estimates suggest that reporting a high Spanish score compared to a low Spanish score on one's application increased the likelihood of admission by approximately 4.6 percentage points. Going from a high Spanish score to possibly being a native speaker increases the likelihood of admission by an additional 2.6 percentage points. Given the comparable magnitudes of these estimates, one could plausibly argue that such a pattern is consistent with increasing returns to Spanish language skill.

However, this type of pattern is not typical for the UC campuses. At Davis in the previous two three-year periods, reporting a high versus a low Spanish score on one's application actually lowers the odds of admission for non-minority applicants. The same holds true for Irvine, Santa Cruz, and Riverside in all periods. At these four campuses, having a higher Spanish score, conversely, increases the likelihood of admission when the applicant happens to be a minority. Such a pattern likely suggests that these campuses maintained some form of admission preference for Hispanic applicants.

Up until this point, I have presented indirect evidence that the positive gap between minority and non-minority admission rates observed at the various University of California campuses is not likely the result of minority applicants having higher unobserved ability. Alternatively, one can try to account more directly for the differences in unobserved ability across applicants. Applicants base their decision on whether or not to apply to a particular school, at least in part, on private knowledge of their unobserved skills. Therefore, controlling for the set of campuses to which a given student applied should at least partially account for differences in unobserved ability across applicants.

As an alternative to using application pattern fixed effects, one can pool the application data across campuses and estimate admission rate gaps relying on individual applicant fixed effects to account for high school student unobservables. The use of applicant fixed effects requires that admission rate gaps be estimated relative to a baseline UC campus. In **Table 5**, I present estimates of minority/non-minority admission rate gaps at each campus relative to Riverside for the three-year periods just before and after the passage of Proposition 209.[14] Because Riverside is the least selective of the UC campuses, choosing it as the baseline campus should minimize the difference between estimates of relative and absolute admission rate gaps. Table 5 presents estimates where I attempt to control for applicant unobservables using application pattern and applicant fixed effects separately, as well as combined.

Estimates of relative admission rate gaps between minority and non-minority applicants do not drastically change with the inclusion of different types of controls for student unobservables. Including admission pattern (i.e. DK-type) fixed effects produces slightly smaller estimates relative to OLS, while including individual applicant fixed effects produces

[14] **Table A.4** provides similar estimates for 2001 to 2006.

somewhat larger estimates of relative admission rate gaps. Using both types of fixed effects simultaneously also leads to higher estimates relative to OLS. These estimates suggest the use of admission preferences by each of the UC campuses both before and after the passage of Proposition 209. In the period after the law banned the use of affirmative action in admissions, the UC campuses appear to have greatly diminished the impact of racial admission preferences without fully eliminating their use.

Previously, I have argued that individual FE estimates are, in theory, more reliable than DK estimates for signing the bias of OLS estimates of absolute admission preferences. Following this logic and comparing the estimates in Table 5 would seem to suggest that OLS estimates of minority admission preferences are likely to be biased downwards. I now show that this intuition likely holds when comparing different estimates of relative admission preferences.

Individual FE estimates of relative admission preferences are larger than OLS estimates for all campuses and all time-periods analyzed. This can only be the case if:

$$(\bar{Z}_{0t}^{(urm)} - \bar{Z}_{0t}^{(non)}) > \frac{\alpha_{ct}\gamma_{ct}}{\alpha_{0t}\gamma_{0t}}(\bar{Z}_{ct}^{(urm)} - \bar{Z}_{ct}^{(non)}) + \nu_{ct} \qquad \text{(viii)}$$

Where:

$$\nu_{ct} = \frac{1}{\alpha_{0t}\gamma_{0t}}(\bar{Z}_{0t}^{(urm)} \sum_{g=1}^{G}(W_{g0t}^{(non)} - W_{g0t}^{(urm)})\bar{\gamma}_{gt} - \bar{Z}_{ct}^{(urm)} \sum_{g=1}^{G}(W_{gct}^{(non)} - W_{gct}^{(urm)})\bar{\gamma}_{gt}) \qquad \text{(ix)}$$

Comparing OLS and DK estimates of absolute admission preferences suggests that minorities that apply to the least selective UC campuses (i.e. Santa Cruz and Riverside) are disproportionally overrepresented in the applicant groups with lower average unobservables

$(\sum_{g=1}^{G}(W_{gct}^{(non)} - W_{gct}^{(urm)})\bar{Z}_{gt} > 0)$.[15] The opposite appears to be true for the remaining, more selective campuses. If we assume that applicant groups with higher average unobservables are more likely to apply to campuses that put greater weight on unobservables (i.e. $cor(\bar{Z}_{gt}, \bar{\gamma}_{gt}) > 0$), then our findings from comparing OLS and DK estimates of absolute admission preferences suggest that v_{ct} is positive (if it similarly follows that $\sum_{g=1}^{G}(W_{gct}^{(non)} - W_{gct}^{(urm)})\bar{\gamma}_{gt}$ is negative at the selective campuses and positive at Riverside). Since Riverside is the least selective of the UC campuses it also must surely be the case that $\frac{\alpha_{ct}\gamma_{ct}}{\alpha_{0t}\gamma_{0t}}$ is greater than one.[16]

Equation (viii) suggests that the following two conditions both need to hold in order for the OLS estimate of the admission preference at a particular UC school to be upward biased:

1. Minority applicants on average have higher unobserved skills than non-minority applicants at both Riverside and UC campus *c*; and,
2. The minority/non-minority gap in unobserved skills is larger at Riverside than at UC campus *c*.

Results from specifications with DK-type fixed effects are the only ones that would seem to suggest that OLS estimates are upward biased for any of the UC campuses. However, the same set of results also suggests that OLS estimates are downward biased for Riverside (i.e. minority applicants to Riverside have, on average, lower unobserved skills than non-minorities). This

[15] DK estimates of absolute admission preferences can be determined by adding the coefficient estimate for minority to the relative admission preference estimates for each campus.

[16] This term is greater than one if non-minority applicants to campus *c*, on average, apply to UC schools that put greater weight on unobservables than non-minority applicants to Riverside.

would appear to cast doubt on the first condition being true. This, in turn, would seem to support the idea that the OLS estimates are not upward biased.

The greatest concern in interpreting the results of this paper is not simply that they are influenced by upward bias, but that they are driven completely by such bias. Let us assume that both the second condition is true and that minorities, in fact, have received no admission preferences after Proposition 209. The OLS estimates of admission gaps then must suggest, for example, that Santa Barbara put at least 20 times more weight on applicant unobservables in making admission decisions than did Riverside in the 1998 to 2000 period. Given that Santa Barbara is only somewhat more selective than Riverside, the suggested difference in magnitude in how these two campuses compare applicant unobservables would appear to be implausibly large. Therefore, it is very difficult not to conclude that UC schools maintained some use of minority admission preferences after the passage of Proposition 209.

6. Conclusion

Using administrative data on applicants to the University of California, I investigate to what extent UC admission offices complied with California's ban on affirmative action. The richness of this data allows me to control for a host of factors related to applicant minority status and the likelihood of admission. I find that the majority of UC campuses reduced, though did not fully eliminate, the use of admission preferences for minority applicants after the affirmative action ban. Additionally, indirect evidence suggests that the most selective UC campuses – Berkeley, UCLA, and UC San Diego - maintained higher admission preferences for African-American applicants relative to Hispanic applicants in the period immediately after the passage

of Proposition 209. These results are robust to a number of alternative strategies for dealing with applicant unobservables. Finally, I show that by comparing estimates from specifications with different types of fixed effects, one can effectively sign the bias of OLS estimates. These results suggest that OLS estimates of minority admission preferences are likely to be negatively biased.

The findings of this study suggest that additional enforcement measures may be necessary to ensure that state institutions fully comply with affirmative action bans. For the case of public universities, this would likely require greater transparency regarding the admission decision-making process. Independent monitoring or auditing of admission decisions might also ensure better compliance. The effectiveness of any of these types of measures will likely depend on which mechanisms lead affirmative action practices to persist.[17]

[17] Price and Wolfers (2010) find that NBA referees have a tendency to be own-raced biased in making foul calls against players, even though their decision making is transparent and subject to a high level of accountability and monitoring.

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Tables

Table 1 Proportion of UC Applicants that were Admitted Pre (1995-1997) and Post (1998-2006) Passage of Proposition 209

UC Campus	Minority Applicants			Non-minority Applicants			Minority/ Non-minority Gap		
	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change
Berkeley	0.55	0.24	-0.31***	0.34	0.27	-0.07***	0.21***	-0.04***	-0.24***
LA	0.51	0.22	-0.29***	0.39	0.30	-0.10***	0.11***	-0.08***	-0.19***
Davis	0.88	0.61	-0.27***	0.74	0.66	-0.08***	0.14***	-0.05***	-0.19***
San Diego	0.61	0.35	-0.26***	0.61	0.45	-0.16***	-0.00	-0.10***	-0.10***
Irvine	0.72	0.49	-0.22***	0.74	0.63	-0.12***	-0.03***	-0.13***	-0.11***
Santa Barbara	0.82	0.53	-0.29***	0.79	0.55	-0.25***	0.02***	-0.02***	-0.05***
Santa Cruz	0.87	0.76	-0.11***	0.86	0.83	-0.03***	0.01**	-0.07***	-0.08***
Riverside	0.84	0.85	0.01**	0.87	0.91	0.04***	-0.03***	-0.06***	-0.03***

Notes: In comparing the change in the admissions rate of each racial/ethnic group, or the difference in the admission rates of minority and non-minority applicants, the statistical significance of changes (differences) is reflected as follows: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 2 Minority/Non-minority Admission Gap Conditional on Applicant Observables

		Post Passage of Prop. 209		
UC Campus	1995-1997	1998-2000	2001-2003	2004-2006
Berkeley	0.452***	0.136***	0.129***	0.097***
	[0.005]	[0.004]	[0.004]	[0.003]
LA	0.379***	0.113***	0.093***	0.060***
	[0.004]	[0.004]	[0.003]	[0.003]
Davis	0.300***	0.074***	0.079***	0.067***
	[0.004]	[0.005]	[0.004]	[0.004]
San Diego	0.239***	0.056***	0.064***	0.059***
	[0.004]	[0.004]	[0.003]	[0.003]
Irvine	0.125***	0.067***	0.056***	0.026***
	[0.005]	[0.005]	[0.004]	[0.003]
Santa Barbara	0.139***	0.102***	0.087***	0.067***
	[0.004]	[0.004]	[0.004]	[0.003]
Santa Cruz	0.081***	0.024***	0.005	0.012***
	[0.005]	[0.005]	[0.004]	[0.004]
Riverside	0.037***	0.005	0.004	0.006**
	[0.005]	[0.004]	[0.003]	[0.003]

Notes: Each estimate corresponds to a separate OLS regression. Regressions also include controls for high school GPA, SAT I math and verbal scores, SAT II writing score, intended major, parental education, and family income. Robust standard errors are reported in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 3 Minority/Non-Minority Gap in College Outcomes for Applicants that Enroll at a UC Campus

	Cumulative GPA				Graduated		
	1995	1998	2001	2004	1995	1998	2001
UC Campus	-1997	-2000	-2003	-2006	-1997	-2000	-2003
Berkeley	-0.033***	-0.047***	-0.078***	-0.069***	-0.045***	-0.039***	-0.058***
	[0.009]	[0.008]	[0.007]	[0.007]	[0.007]	[0.006]	[0.006]
LA	-0.036***	-0.049***	-0.079***	-0.078***	-0.037***	-0.036***	-0.051***
	[0.008]	[0.007]	[0.006]	[0.006]	[0.006]	[0.006]	[0.005]
Davis	-0.035***	-0.044***	-0.068***	-0.075***	-0.050***	-0.047***	-0.062***
	[0.011]	[0.009]	[0.008]	[0.008]	[0.008]	[0.007]	[0.006]
San Diego	-0.039***	-0.045***	-0.076***	-0.070***	-0.041***	-0.030***	-0.056***
	[0.009]	[0.008]	[0.007]	[0.007]	[0.007]	[0.006]	[0.005]
Irvine	-0.018*	-0.036***	-0.081***	-0.079***	-0.024***	-0.033***	-0.059***
	[0.011]	[0.009]	[0.008]	[0.007]	[0.008]	[0.007]	[0.006]
Santa Barbara	-0.055***	-0.042***	-0.085***	-0.080***	-0.041***	-0.032***	-0.054***
	[0.010]	[0.008]	[0.007]	[0.007]	[0.008]	[0.006]	[0.006]
Santa Cruz	-0.055***	-0.044***	-0.065***	-0.068***	-0.033***	-0.038***	-0.049***
	[0.015]	[0.012]	[0.009]	[0.009]	[0.010]	[0.009]	[0.007]
Riverside	-0.028*	-0.035***	-0.075***	-0.091***	-0.016	-0.022***	-0.042***
	[0.014]	[0.011]	[0.009]	[0.009]	[0.011]	[0.008]	[0.007]

Notes: Each estimate corresponds to a separate OLS regression. Regressions also include controls for high school GPA, SAT I math and verbal scores, SAT II writing score, intended major, parental education, family income, and enrollment campus. Robust standard errors are reported in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 4 Admission Preference Estimates with Controls for Elective SAT II Subject and Scores

			Post Passage of Prop. 209			
UC Campus	1998-2000		2001-2003		2004-2006	
Berkeley						
Minority	0.122***	0.131***	0.118***	0.125***	0.085***	0.091***
	[0.004]	[0.005]	[0.004]	[0.004]	[0.003]	[0.003]
Spanish SAT II - High Score	0.073***	0.155***	0.047***	0.127***	0.066***	0.138***
	[0.009]	[0.015]	[0.008]	[0.014]	[0.007]	[0.014]
Minority x Spanish High Score	-	-0.119***	-	-0.106***	-	-0.094***
		[0.016]		[0.015]		[0.014]
LA						
Minority	0.104***	0.110***	0.077***	0.083***	0.046***	0.053***
	[0.004]	[0.004]	[0.003]	[0.003]	[0.003]	[0.003]
Spanish SAT II - High Score	0.071***	0.160***	0.069***	0.154***	0.067***	0.174***
	[0.008]	[0.014]	[0.006]	[0.013]	[0.006]	[0.013]
Minority x Spanish High Score	-	-0.115***	-	-0.105***	-	-0.130***
		[0.015]		[0.014]		[0.014]
Davis						
Minority	0.071***	0.069***	0.076***	0.074***	0.058***	0.056***
	[0.005]	[0.005]	[0.004]	[0.004]	[0.004]	[0.004]
Spanish SAT II - High Score	0.001	-0.039***	0.022**	-0.012	0.067***	0.046***
	[0.010]	[0.015]	[0.009]	[0.012]	[0.009]	[0.012]
Minority x Spanish High Score	-	0.053***	-	0.043***	-	0.026**
		[0.018]		[0.014]		[0.013]
San Diego						
Minority	0.046***	0.048***	0.049***	0.050***	0.044***	0.047***
	[0.004]	[0.004]	[0.003]	[0.003]	[0.003]	[0.003]
Spanish SAT II - High Score	0.068***	0.087***	0.099***	0.116***	0.100***	0.140***
	[0.008]	[0.012]	[0.007]	[0.011]	[0.007]	[0.011]
Minority x Spanish High Score	-	-0.026*	-	-0.022*	-	-0.050***
		[0.014]		[0.012]		[0.012]

Notes: Estimates for each campus and from each column correspond to separate OLS regressions. Regressions also include controls for high school GPA, SAT I math and verbal scores, SAT II writing score, intended major, parental education, family income, and elective SAT II subject/score fixed effects (where the omitted category is Spanish SAT II - Low Score). Robust standard errors are reported in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 4 (Cont'd)

UC Campus	1998-2000		Post Passage of Prop. 209 2001-2003		2004-2006	
Irvine						
Minority	0.061***	0.058***	0.050***	0.048***	0.023***	0.020***
	[0.005]	[0.005]	[0.004]	[0.004]	[0.003]	[0.004]
Spanish SAT II - High Score	-0.015	-0.065***	0.001	-0.047***	0.008	-0.062***
	[0.010]	[0.019]	[0.008]	[0.014]	[0.007]	[0.013]
Minority x Spanish High Score	-	0.059***	-	0.055***	-	0.079***
		[0.020]		[0.015]		[0.013]
Santa Barbara						
Minority	0.092***	0.092***	0.078***	0.077***	0.058***	0.058***
	[0.005]	[0.005]	[0.004]	[0.004]	[0.003]	[0.003]
Spanish SAT II - High Score	0.058***	0.062***	0.079***	0.065***	0.054***	0.055***
	[0.009]	[0.015]	[0.007]	[0.012]	[0.007]	[0.011]
Minority x Spanish High Score	-	-0.006	-	0.016	-	-0.002
		[0.017]		[0.013]		[0.011]
Santa Cruz						
Minority	0.020***	0.017***	-0.000	-0.005	0.013***	0.008*
	[0.005]	[0.005]	[0.004]	[0.004]	[0.004]	[0.004]
Spanish SAT II - High Score	-0.016*	-0.074***	0.017**	-0.077***	0.018**	-0.085***
	[0.009]	[0.015]	[0.007]	[0.012]	[0.008]	[0.013]
Minority x Spanish High Score	-	0.073***	-	0.111***	-	0.124***
		[0.017]		[0.014]		[0.013]
Riverside						
Minority	0.004	0.003	-0.008***	-0.011***	-0.003	-0.006
	[0.004]	[0.004]	[0.003]	[0.003]	[0.003]	[0.003]
Spanish SAT II - High Score	-0.02***	-0.059***	0.035***	-0.075***	0.019***	-0.073***
	[0.008]	[0.019]	[0.006]	[0.016]	[0.006]	[0.017]
Minority x Spanish High Score	-	0.041**	-	0.118***	-	0.098***
		[0.020]		[0.016]		[0.017]

Table 5 Admission Preference Estimates with Controls for Applicant Unobservables

	Pre Prop. 209 Passage (1995-1997)				Post Prop. 209 Passage (1998-2000)			
VARIABLES	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Minority	0.037***	0.043***	-	-	0.005	0.011***	-	-
	[0.005]	[0.005]			[0.004]	[0.004]		
Minority x Berkeley	0.415***	0.399***	0.485***	0.471***	0.132***	0.121***	0.143***	0.137***
	[0.007]	[0.007]	[0.010]	[0.011]	[0.006]	[0.006]	[0.008]	[0.008]
Minority x LA	0.342***	0.320***	0.381***	0.361***	0.109***	0.091***	0.124***	0.110***
	[0.007]	[0.007]	[0.010]	[0.010]	[0.005]	[0.005]	[0.007]	[0.007]
Minority x Davis	0.263***	0.249***	0.305***	0.292***	0.070***	0.059***	0.084***	0.081***
	[0.007]	[0.007]	[0.010]	[0.010]	[0.006]	[0.006]	[0.009]	[0.009]
Minority x San Diego	0.202***	0.191***	0.239***	0.232***	0.052***	0.036***	0.067***	0.060***
	[0.007]	[0.007]	[0.010]	[0.010]	[0.005]	[0.005]	[0.008]	[0.008]
Minority x Irvine	0.088***	0.083***	0.111***	0.107***	0.063***	0.052***	0.080***	0.073***
	[0.007]	[0.007]	[0.010]	[0.010]	[0.006]	[0.006]	[0.008]	[0.008]
Minority x Santa Barbara	0.102***	0.096***	0.107***	0.102***	0.098***	0.082***	0.123***	0.112***
	[0.006]	[0.006]	[0.009]	[0.009]	[0.006]	[0.006]	[0.008]	[0.008]
Minority x Santa Cruz	0.045***	0.042***	0.051***	0.048***	0.019***	0.019***	0.039***	0.042***
	[0.007]	[0.007]	[0.010]	[0.010]	[0.005]	[0.005]	[0.008]	[0.008]
Fixed Effects								
Applicant	No	No	Yes	Yes	No	No	Yes	Yes
Campus	Yes	No	Yes	No	Yes	No	Yes	No
Application Pattern x Campus	No	Yes	No	Yes	No	Yes	No	Yes
Observations	411,601	411,601	411,601	411,601	559,183	559,183	559,183	559,183
R-squared	0.512	0.520	0.709	0.713	0.487	0.502	0.679	0.685

Notes: Each column corresponds to a separate regression. Regressions also include controls for high school GPA, SAT I math and verbal scores, SAT II writing score, intended major, parental education, and family income where all regressors are fully interacted with campus (with the excluded category being Riverside). Robust standard errors, clustered by applicant, are reported in brackets. *** p<0.01, ** p<0.05, * p<0.1

Appendix Tables

Table A.1 Interval Regression Results for Estimation of SAT II Writing Score Distribution Parameters by Cohort and Minority Status

	Minority Applicants				Non-minority Applicants			
PARAMETERS	1995-1997	1998-2000	2001-2003	2004-2006	1995-1997	1998-2000	2001-2003	2004-2006
Applied to:								
Berkeley	28.982***	30.824***	26.908***	29.766***	42.695***	46.198***	41.159***	43.680***
	[1.331]	[1.265]	[1.072]	[0.972]	[0.603]	[0.542]	[0.491]	[0.478]
LA	-2.645**	6.348***	7.069***	11.169***	4.665***	11.241***	17.735***	19.623***
	[1.309]	[1.244]	[1.066]	[0.963]	[0.619]	[0.559]	[0.510]	[0.501]
Davis	-1.329	-6.709***	-4.107***	-3.113***	-16.739***	-19.357***	-16.966***	-15.775***
	[1.434]	[1.320]	[1.097]	[0.999]	[0.590]	[0.530]	[0.473]	[0.461]
San Diego	15.572***	16.547***	17.839***	20.695***	19.505***	20.679***	21.847***	19.899***
	[1.317]	[1.212]	[1.020]	[0.929]	[0.586]	[0.537]	[0.499]	[0.490]
Irvine	-18.480***	-19.321***	-17.274***	-5.789***	-44.326***	-41.433***	-28.418***	-20.141***
	[1.390]	[1.262]	[1.029]	[0.923]	[0.670]	[0.575]	[0.495]	[0.479]
Santa Barbara	-14.884***	-8.518***	-5.801***	2.427***	-26.525***	-11.424***	-4.855***	2.747***
	[1.304]	[1.214]	[1.018]	[0.922]	[0.601]	[0.533]	[0.481]	[0.468]
Santa Cruz	-9.534***	-9.149***	-12.843***	-6.956***	-2.358***	-7.794***	-9.454***	-8.410***
	[1.553]	[1.393]	[1.117]	[1.027]	[0.714]	[0.618]	[0.524]	[0.503]
Riverside	-41.633***	-42.898***	-48.052***	-44.521***	-40.209***	-43.975***	-50.969***	-51.026***
	[1.556]	[1.290]	[1.053]	[0.947]	[0.808]	[0.649]	[0.537]	[0.522]
Constant	501.206***	519.127***	531.754***	517.923***	560.222***	574.460***	588.151***	583.746***
	[1.596]	[1.541]	[1.405]	[1.201]	[0.650]	[0.591]	[0.545]	[0.530]
Sigma	96.46***	97.25***	97.61***	94.84***	96.17***	95.81***	93.03***	90.87***
	[0.498]	[0.458]	[0.382]	[0.348]	[0.207]	[0.178]	[0.161]	[0.158]
Observations	26,250	29,149	40,649	46,981	122,226	152,220	176,357	177,292

Table A.2 Mean UC Applicant Characteristics Pre (1995-1997) and Post (1998-2006) Passage of Proposition 209

UC Campus	Minority Applicants			Non-minority Applicants			Minority/ Non-minority Gap		
	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change
Berkeley									
HS GPA	3.57	3.67	0.09***	3.85	3.88	0.03***	-0.27***	-0.21***	0.06***
SAT I Math	557	560	4***	651	656	4***	-95***	-96***	-1
SAT I Verbal	553	549	-3***	606	613	7***	-54***	-64***	-10***
SAT II Writing	519	544	26***	583	618	35***	-64***	-74***	-9***
Intended Science	0.27	0.28	0.00	0.34	0.35	0.01**	-0.07***	-0.07***	-0.00
Intended Soc. Sci.	0.18	0.18	0.01*	0.12	0.12	0.01***	0.06***	0.06***	0.00
LA									
HS GPA	3.49	3.61	0.13***	3.77	3.82	0.06***	-0.28***	-0.21***	0.07***
SAT I Math	536	546	9***	633	642	9***	-97***	-96***	0
SAT I Verbal	532	533	2**	584	597	13***	-52***	-64***	-12***
SAT II Writing	498	529	31***	559	603	43***	-62***	-74***	-12***
Intended Science	0.29	0.31	0.02***	0.33	0.34	0.00	-0.04***	-0.03***	0.01***
Intended Soc. Sci.	0.23	0.20	-0.04***	0.18	0.15	-0.03***	0.05***	0.04***	-0.01

Notes: In comparing the change in mean applicant characteristics of each racial/ethnic group, or the difference in the mean characteristics of minority and non-minority applicants, the statistical significance of changes (differences) is reflected as follows: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. HS GPA refers to high school grad point average. Intended Science (Intended Soc. Sci.) is an indicator variable equal to one if the applicant stated that she intended to major in the broad sciences (broad social sciences) on her application. The omitted category for intended major is all other non-science, non-social science majors.

Table A.2 Continued

UC Campus	Minority Applicants			Non-minority Applicants			Minority/ Non-minority Gap		
	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change
Davis									
HS GPA	3.51	3.54	0.04***	3.70	3.71	0.01***	-0.19***	-0.17***	0.03***
SAT I Math	545	544	-1	617	622	5***	-73***	-78***	-6***
SAT I Verbal	537	531	-6***	575	579	4***	-38***	-48***	-10***
SAT II Writing	503	524	21***	548	581	33***	-45***	-57***	-12***
Intended Science	0.36	0.40	0.04***	0.39	0.44	0.04***	-0.04***	-0.04***	-0.00
Intended Soc. Sci.	0.16	0.23	0.07***	0.13	0.19	0.05***	0.03***	0.05***	0.02***
San Diego									
HS GPA	3.50	3.60	0.10***	3.75	3.79	0.04***	-0.25***	-0.19***	0.06***
SAT I Math	549	550	2	633	637	4***	-84***	-87***	-3**
SAT I Verbal	544	538	-6***	591	594	3***	-47***	-56***	-9***
SAT II Writing	509	534	25***	565	599	34***	-56***	-65***	-9***
Intended Science	0.37	0.35	-0.03***	0.39	0.38	-0.01***	-0.02***	-0.04***	-0.02***
Intended Soc. Sci.	0.18	0.21	0.03***	0.14	0.16	0.02***	0.04***	0.05***	0.01**
Irvine									
HS GPA	3.40	3.51	0.11***	3.60	3.66	0.06***	-0.20***	-0.15***	0.05***
SAT I Math	520	530	10***	609	620	11***	-89***	-90***	-1
SAT I Verbal	512	516	4***	549	567	18***	-37***	-51***	-14***
SAT II Writing	476	509	33***	518	569	51***	-42***	-60***	-19***
Intended Science	0.36	0.35	-0.01**	0.41	0.40	-0.01***	-0.05***	-0.05***	-0.00
Intended Soc. Sci.	0.17	0.22	0.05***	0.14	0.16	0.02***	0.03***	0.06***	0.03***

Table A.2 Continued

UC Campus	Minority Applicants			Non-minority Applicants			Minority/ Non-minority Gap		
	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change
Santa Barbara									
HS GPA	3.35	3.50	0.15***	3.51	3.65	0.14***	-0.16***	-0.15***	0.01
SAT I Math	523	536	13***	593	615	22***	-71***	-79***	-8***
SAT I Verbal	520	527	6***	560	581	20***	-40***	-54***	-14***
SAT II Writing	485	520	34***	531	582	51***	-45***	-62***	-17***
Intended Science	0.25	0.24	-0.01	0.26	0.26	0.00	-0.02***	-0.02***	-0.01
Intended Soc. Sci.	0.19	0.21	0.01***	0.13	0.14	0.01***	0.06***	0.07***	0.00
Santa Cruz									
HS GPA	3.31	3.41	0.09***	3.50	3.56	0.06***	-0.19***	-0.15***	0.03***
SAT I Math	522	528	6***	594	603	9***	-72***	-75***	-4***
SAT I Verbal	526	523	-3**	577	577	-0	-51***	-54***	-3*
SAT II Writing	489	514	24***	545	575	29***	-56***	-61***	-5***
Intended Science	0.26	0.06	-0.20***	0.25	0.06	-0.19***	0.01**	-0.00**	-0.02***
Intended Soc. Sci.	0.25	0.05	-0.20***	0.18	0.04	-0.15***	0.07***	0.01***	-0.06***
Riverside									
HS GPA	3.30	3.42	0.13***	3.50	3.52	0.02***	-0.20***	-0.10***	0.10***
SAT I Math	499	512	13***	596	598	2***	-96***	-85***	11***
SAT I Verbal	493	499	6***	535	545	10***	-41***	-46***	-4***
SAT II Writing	456	490	34***	502	542	40***	-47***	-53***	-6***
Intended Science	0.22	0.33	0.11***	0.24	0.38	0.14***	-0.03***	-0.06***	-0.03***
Intended Soc. Sci.	0.15	0.19	0.04***	0.10	0.12	0.02***	0.06***	0.07***	0.01**

Table A.3 Minority/Non-minority Admission Gap by UC Campus
(Applicants who Enroll at a UC Campus)

		Post Passage of Prop. 209		
UC Campus	1995-1997	1998-2000	2001-2003	2004-2006
Berkeley	0.307***	0.078***	0.066***	0.053***
	[0.006]	[0.005]	[0.004]	[0.003]
LA	0.236***	0.051***	0.032***	0.018***
	[0.005]	[0.004]	[0.003]	[0.003]
Davis	0.208***	0.051***	0.065***	0.074***
	[0.005]	[0.005]	[0.004]	[0.004]
San Diego	0.185***	0.021***	0.038***	0.044***
	[0.005]	[0.005]	[0.004]	[0.004]
Irvine	0.079***	0.056***	0.044***	0.027***
	[0.005]	[0.005]	[0.004]	[0.004]
Santa Barbara	0.056***	0.053***	0.048***	0.046***
	[0.004]	[0.005]	[0.004]	[0.004]
Santa Cruz	0.017***	0.019***	0.009**	0.016***
	[0.004]	[0.004]	[0.004]	[0.004]
Riverside	-0.008**	-0.006**	-0.001	0.001
	[0.004]	[0.003]	[0.002]	[0.002]

Notes: Each estimate corresponds to a separate OLS regression. Regressions also include controls for high school GPA, SAT I math and verbal scores, SAT II writing score, intended major, parental education, and family income. Robust standard errors are reported in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table A.4 Admission Preference Estimates with Controls for Applicant Unobservables (2001-2006)

	2001-2003				2004-2006			
VARIABLES	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Minority	0.004	0.008***	-	-	0.006**	0.012***	-	-
	[0.003]	[0.003]			[0.003]	[0.003]		
Minority x Berkeley	0.125***	0.117***	0.136***	0.124***	0.091***	0.080***	0.106***	0.097***
	[0.005]	[0.005]	[0.006]	[0.006]	[0.004]	[0.005]	[0.006]	[0.006]
Minority x LA	0.090***	0.074***	0.098***	0.080***	0.053***	0.039***	0.067***	0.053***
	[0.004]	[0.004]	[0.005]	[0.005]	[0.004]	[0.004]	[0.006]	[0.006]
Minority x Davis	0.075***	0.064***	0.088***	0.079***	0.061***	0.049***	0.076***	0.074***
	[0.005]	[0.005]	[0.007]	[0.007]	[0.005]	[0.005]	[0.007]	[0.007]
Minority x San Diego	0.060***	0.048***	0.070***	0.059***	0.053***	0.040***	0.065***	0.058***
	[0.004]	[0.004]	[0.006]	[0.006]	[0.004]	[0.004]	[0.006]	[0.006]
Minority x Irvine	0.052***	0.042***	0.060***	0.052***	0.020***	0.014***	0.028***	0.028***
	[0.005]	[0.005]	[0.006]	[0.006]	[0.004]	[0.005]	[0.006]	[0.006]
Minority x Santa Barbara	0.083***	0.069***	0.097***	0.086***	0.061***	0.047***	0.069***	0.063***
	[0.005]	[0.005]	[0.006]	[0.006]	[0.004]	[0.004]	[0.006]	[0.006]
Minority x Santa Cruz	0.001	0.000	0.012*	0.011*	0.006	0.009*	0.020***	0.031***
	[0.004]	[0.004]	[0.006]	[0.006]	[0.005]	[0.005]	[0.007]	[0.007]
Fixed Effects								
Applicant	No	No	Yes	Yes	No	No	Yes	Yes
Campus	Yes	No	Yes	No	Yes	No	Yes	No
Application Pattern x Campus	No	Yes	No	Yes	No	Yes	No	Yes
Observations	735,969	735,969	735,969	735,969	779,099	779,099	779,099	779,099
R-squared	0.503	0.521	0.680	0.688	0.508	0.524	0.680	0.687

Notes: Each column corresponds to a separate regression. Regressions also include controls for high school GPA, SAT I math and verbal scores, SAT II writing score, intended major, parental education, and family income, where all regressors are fully interacted with campus (with the excluded category being Riverside). Robust standard errors, clustered by applicant, are reported in brackets. *** p<0.01, ** p<0.05, * p<0.1.