

MINORITY HIGHER EDUCATION PIPELINE: CONSEQUENCES OF CHANGES IN COLLEGE ADMISSIONS POLICY IN TEXAS*

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***Abstract:** This paper examines the application, admission and enrollment consequences of rescinding affirmative action and then implementing an admission guarantee for students who graduate in the top 10% of their high school class. Using administrative data the two most selective public institutions in Texas and data from the Texas Education Agency, we derive application rates for graduates from Texas public high schools between 1993 and 2003. In addition to computing changes in application, admission and enrollment rates for each policy regime, we simulate the gains and losses associated with each policy regime and also those from assigning minorities the corresponding rates for white students. Challenging popular claims that the top 10% law has restored diversification of Texas's public flagships, our analyses that consider both changes in the size of graduation cohorts and institutional carrying capacity show that the uniform admission regime did not restore Hispanic and black representation at UT and TAMU even after four years. Simulations of gains and losses at each stage of the college pipeline across admission regimes for Hispanics and blacks confirm that affirmative action is the most efficient policy to diversify college campuses, even in highly segregated states like Texas.*

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Introduction

Texas higher education has been in the spotlight since the 1996 *Hopwood* decision outlawed the use of race and national origin in college admissions throughout the Fifth Circuit.¹ The following year several campuses, including the University of Texas at Austin (UT) and Texas A&M University (TAMU), registered sharp declines in the number of black and Hispanic first time freshmen (Barr, 2002).² In response to the judicial ban imposed by *Hopwood*, the 75th Texas legislature passed H.B.588—the uniform admission law—which guarantees admission to any Texas public university to seniors who graduate in the top decile of their class. Popularly known as the top 10% law, H.B.588 also specified 18 factors that universities should consider in admitting students who do not qualify for automatic admission, including socioeconomic status, second language ability, and indications that the student overcame adversity (see Long and Tienda, 2008a). The uniform admission law was fully in force for the fall, 1998 admission cohort.

Spearheaded by the late Congresswoman Irma Rangel, H.B.588 was intended to increase college access to a wide spectrum of the Texas population by attracting the very best students of every high school to the State’s flagship universities (Holley and Spencer, 1999; Montejano, 2001). Initially the law was praised as a race-neutral alternative to affirmative action that both rewarded merit and broadened college access (Tienda and Sullivan, 2009). Supporters claimed that the percent plan helped restore diversity to the flagship campuses, partly by capitalizing on segregation (Tienda and Niu, 2006) and partly by removing the standardized test score barrier (Alon and Tienda, 2007). Over time, however, the top 10% law has become as controversial as the affirmative action regime it replaced. Opponents argue that percent-based admission regimes

¹ *Hopwood v Texas*, 78 F.3d 932 (5th Cir. 1996), *cert. denied*, 518 U.S. 1033 (1996).

² UT-Dallas and Texas Tech University also reported sharp declines in the number of minority first time freshmen, as did their professional schools.

not only are a disguised form of affirmative action, but that they also are unfair to high achieving students ranked below the 90th percentile who graduate from competitive high schools. Although the landmark 2003 *Grutter*³ decision reversed *Hopwood*, the top 10% law remains in force until repealed by the Texas legislature. In effect, between the early 1990s and the present, judicial and statutory decisions produced four different college admission regimes in Texas:

- Pre-*Hopwood*: affirmative action permitted (pre-1996);⁴
- *Hopwood*: Judicial ban on affirmative action (1997);
- Top 10% law with continued judicial ban (1998-2003);
- Post-*Grutter*: affirmative action permitted, top 10% law remains in effect (2004 – present).⁵

Because college admissions are highly scrutinized, researchers have focused on this aspect of post-secondary decisions, especially on the admission advantage enjoyed by minority applicants (Bowen and Bok, 1998; Long and Tienda, 2008b). College administrators and legislators measure success in achieving campus diversity based on freshman enrollment, and to a lesser extent, graduation rates. Despite their centrality in shaping the composition of entering classes, with few exceptions (e.g., Long, 2004; Card and Krueger, 2005; Brown and Hirschman, 2006; Long and Tienda, 2008a; Koffman and Tienda, 2008), application rates have been relatively ignored as a focus of inquiry. Partly this reflects data constraints and partly the fact that litigation largely focuses on institutional admissions decisions, not individual decisions to apply or enroll, conditional on acceptance.

³ *Grutter v. Bollinger*, 539 U.S. 306, 328 (2003).

⁴ Because the *Hopwood* decision was delivered on March 18, 1996, and applications for the entering class of the fall of 1996 were mostly adjudicated, the *Hopwood* decision took effect for the entering class of the fall of 1997.

⁵ Although *Grutter* permits narrowly tailored consideration of race in college admissions, the top 10% law explicitly required a full year advance notice before announced changes in admission criteria could take effect. Therefore, no Texas universities could restore affirmative action until fall 2005 admissions.

Several analysts have begun to fill this gap, particularly researchers interested in the consequences of shifting from an admission regime that considered race as one of many factors to one that guarantees admission to the top 10% graduates. For example, Long and Tienda (2008a) show that the elimination of affirmative action and implementation of a percent plan, which directly impacts the admissions systems only of the most selective institutions, also produces substantial indirect effects at other institutions. Their analyses of administrative data show that average test scores of applicants to less selective institutions rose following the change in admission criteria, as students with high test scores who did not qualify for the admission guarantee applied to a broader set of institutions. Furthermore, as the share of top 10 % applicants at UT-Austin rose, the average test scores of their applicant pool stagnated.

Although highly informative, Long and Tienda (2008a) only consider the subset of students who actually applied to specific post-secondary institutions. Their analyses did not consider changes in the number of potential applicants (i.e., the size of high school graduation cohorts), which is highly relevant in a state experiencing above-average growth in its college-age population (Tienda and Sullivan, 2009). To address this limitation, Koffman and Tienda (2008) analyze administrative records from UT and TAMU, making two important extensions. First, they compare changes in the applicant pools according to the economic status of their high school; and second, they evaluate application behavior relative to the number of high school graduates in specific years. Their results show that graduates from affluent schools are significantly more likely to seek admission at one of the public flagships compared with their peers who graduated from high schools that served students of low to moderate socioeconomic status. Importantly, this generalization obtains before and after the change in admission regime. Moreover, Koffman and Tienda claim that the admission guarantee did little to raise application

rates to UT and TAMU from poor high schools, although Long, Saenz, and Tienda (2009) find an increase in the number and geographic dispersion of high schools represented at UT.

Building on these insights, this study asks about the consequences of the changes in Texas college admission policies for four major racial groups: whites, Hispanics, Asian Americans, and blacks. Specifically, using over a decade of administrative data for the two flagship campuses, we consider how students from these groups fared across the three policy regimes in force between 1992 and 2003.⁶ To motivate the empirical analysis, we provide a brief overview of the changing demography of Texas higher education. Following a discussion of data and methods, we examine changes in students' application, admission and enrollment rates across the three policy regimes for each group. The conclusion reconciles our findings with those of other studies using similar methods and discusses the implications of dismantling the top 10% law for achieving campus diversity.

Our analysis is novel in two ways: First, we compute application rates by merging school-specific data on high school graduates with college applicants from those schools. This is important in light of the rapid growth of the college-eligible population in Texas (WICHE, 2008; Tienda and Sullivan, 2009). Second, we simulate gains and losses for each group at each stage of the college pipeline under the three regimes analyzed. This exercise goes beyond conventional approaches that estimate admission and enrollment probabilities by quantifying the competition for seats at the Texas flagships. Despite popular claims that the top 10% law has restored diversity to UT and TAMU (Wilgoren, 1999), our results that take into account both growing demand and the carrying capacity of institutions show that Hispanics and blacks are worse off relative to whites than they were under affirmative action.

⁶ Our data do not span the post-*Grutter* period, therefore we can not evaluate changes under the fourth regime that permits affirmative action with the percent plan.

Demography of Texas Higher Education

Owing both to high levels of immigration and high immigrant fertility, Texas is one of the nation's fastest growing and most rapidly diversifying states. Between 1994 and 2004, the number of diploma recipients rose 50 percent, from 163 to 244 thousand (Tienda and Sullivan, 2009). High school graduation rates improved by almost 11 percentage points between 1994 (pre-*Hopwood*) and 2003 (pre-*Grutter*)—rising from 56 to 67 percent (Swanson, 2006)—but large differences remain between whites and disadvantaged minorities.⁷ These differences are particularly striking for Hispanics, many of whom do not complete high school. Nevertheless, the number of Hispanic high school graduates rose 78 percent during this period, raising their share of Texas diploma recipients from 29 percent in 1994 to 35 percent by 2004 (Tienda and Sullivan, 2009). White students are more likely to graduate from high school than Hispanics, but their share of the high school population has been shrinking. In 1994 whites earned 56 percent of diplomas awarded in Texas, but by 2004 their share dropped to 48 percent. WICHE (2008:107) projections indicate that Hispanics will earn 38 percent of diplomas in 2008, compared with 43 percent for whites.

Not all high school graduates pursue post-secondary education of course, but among the college-bound, the larger graduation cohorts imply intensified competition for access to the selective public institutions. Although Texas's post-secondary system expanded in response to growing demand, it failed to keep pace with demographic trends. Postsecondary enrollment rose 27 percent between 1994 and 2004, which is well below the 50 percent increase in the number of high school graduates during the same period (Tienda, 2006). Texas differs from the nation and many other states in another important respect that bears on the college squeeze—namely, the

⁷ TEA reports higher graduation rates (circa 84 percent), but Swanson's Cumulative Promotion Index generates more accurate cohort-estimates. Specifically, the 67 percent graduation rate indicates that only 67 of every 100 9th grade students will graduate four years later.

preponderance of two-year institutions within its post-secondary education system. At the national level, enrollment growth at two- and four-year institutions was relatively similar during this period - around 19-20 percent - but this was not the case in Texas, where two-year institutions registered a 37 percent enrollment increase during the period. Because crowding and institutional carrying capacity are used by critics of affirmative action and the top 10% law alike, it is particularly noteworthy that total enrollment at two-year institutions had surpassed that of four year public institutions in 1995, at least one year before the *Hopwood* decision (THECB, 2005).

The change in Texas college admission regimes over a short period of time coupled with appreciable increases in the number of college-eligible minorities raises several questions about their representation in higher education: How did application, admission and enrollment *rates* to the University of Texas at Austin (UT) and Texas A&M University (TAMU) evolved over the three policy regimes for black, white, Hispanic and Asian students? Second, how have minority-white gaps in application, admission and enrollment rates changed across policy regimes? Finally, what are the enrollment implications of changes in application and admission rates for the four major racial groups? In addressing these questions, we illustrate the policy consequences of changes in Texas college admission policies for racial minorities, currently the fastest growing segment of its college-age population.

Data and Methods

Our analyses use publicly available data from the Texas Education Agency (TEA) about graduates from Texas public high schools and administrative data on applicants, admittees and enrollees to UT-Austin and TAMU for the years 1993-2003. We exclude special and alternative

schools from consideration on grounds that their students may differ systematically in their college going behavior.⁸ Therefore, analyses of application rates based on the TEA are restricted to 942 public high schools that were in operation throughout the observation period. Nearly 95 percent of Texas seniors graduate from public high schools and this share has not changed since the early 1990s (WICHE, 2008). We employed weights to account for school variation in the size and ethnic composition of graduating classes.⁹

Institutional administrative data includes the admission and enrollment status of all applicants to UT and TAMU, as well as several demographic and achievement characteristics of applicants.¹⁰ These include race and ethnicity, class rank, standardized test scores, year of application, and maternal education. Because our restricted access files include the school identifiers, we merge to individual student records school attributes such as size, public/private status, and share of students receiving free or reduced lunch. Finally, we simulate admission and enrollment changes in the post-affirmative action period under several scenarios about application and matriculation behavior for each group.

Application Rates

Table 1 reports group-specific application rates to UT-Austin and TAMU for Texas public school seniors across the three policy regimes. The large differences in application rates between Asians and other groups are striking, particularly at UT, where the Asian-white ratio

⁸ We used publicly available data from the National Center for Education Statistics (NCES) to determine which high schools to exclude from the analysis. Administrative data available to us for UT extend through 2003 and for TAMU through 2002.

⁹ The weight used is the product of two separate weights. The first weight accounts for the size of the graduating class by dividing the total number of graduates by 150, which is the average senior class size for the 942 high schools in the sample. Thus, a school with a graduating class size of 600 students will count double that of one with 300 graduates. The second weight accounts for the group specific share of the graduating class.

¹⁰ Administrative data were compiled by the Texas Higher Education Opportunity Project (THEOP). See <http://www.texastop10.princeton.edu> for further details.

was around 4:1. Taking account of large differences in group sizes provides more concrete perspective on the significance of the application gaps. During the period considered, Asian high school graduates comprised between 2.7 and 3.4 percent of all Texas high school graduates; for Hispanics, the comparable shares were 28 to 34 percent. Although the Asian application rate is almost four times that of whites and more than eight times that of Hispanics, they represent a relatively small share of the college-eligible population. Stated differently, although Texas graduated 10 times as many Hispanic as Asian high school students in 1993, the highly unequal application rates imply approximately 300 more Hispanics than Asians in the applicant pool. Given unequal changes in the size and composition of Texas high school graduates, by 2003 the gap in Asian and Hispanic representation had shrunk to about 200.¹¹ Blacks represented between 12 and 13 percent of all high school graduates during the observation period, but given their low application rates, they represented about 514 and 770 of all public school applicants, respectively in 1993 and 2003.

[Table 1 about Here]

Of particular interest are the changes in application rates across the policy regimes and between institutions. Application rates to UT-Austin fell modestly for all demographic groups after affirmative action was rescinded, but rebounded for all groups except Asians once the top 10% law was instated. Still, application rates of Asian high school graduates were four times higher than whites throughout the period considered. Despite the modest rebound, under the top 10% regime Hispanic and black application rates remained below the levels observed during affirmative action; by contrast, the white application rate to UT returned to its pre-*Hopwood* level. Of course, the absolute number of applicants was larger because the size of the graduation

¹¹ WICHE, 2003, Appendix A: p137 reports 4400 Asian and 45519 Hispanic high school graduates in 1993, representing 2.7 and 28.3 percent of all public high school graduates. In 2003, the comparable numbers were 7,906 and 77971, respectively.

cohorts rose gradually; in 1993, the white application rate of 7.2 percent implied roughly 6,600 students compared with 8,110 in 2003 (see WICHE, 2003: Appendix A).

Comparable data for TAMU differ in several important ways. First, the white application rate is consistently higher by two or three percentage points and the Asian application rate appreciably lower compared with UT. Thus, the Asian-white application gap ranges between one and five percentage points, which is well below the 23 point gap in the comparable gap at UT. Second, Hispanic application rates were systematically lower than those observed at UT for each period, but black application rates were higher for all periods except the top 10% regime. Third, application rates for all groups except Asians fell gradually during the observation period, rather than dropping and rebounding as occurred at UT. Asian application rates actually rose in 1997, following the judicial ban on affirmative action; however, they plummeted nearly five points under the top 10% regime. In part the steady drop in TAMU's application rates reflects a provision in the law that allows rank-eligible students to select their campus; it appears that an unintended consequence of the law is a shift in applications away from TAMU toward UT (Tienda and Sullivan, 2009).

Although the changes in application rates reported in Table 1 seem small, the numbers of black and Hispanic students are not trivial because the population of graduates is large and growing rapidly. Because the population of high school graduates is growing rapidly, albeit unevenly among demographic groups, to provide a more intuitive assessment of the seemingly small changes in rates, we convert the application rates into numbers of students. Table 2 simulates the number of additional applicants under two hypothetical scenarios: 1) if each groups' application rate remained at its affirmative action level; and 2) if each group applied at the same rate as whites within policy regimes. We focus on the two underrepresented groups that

benefitted most from affirmative action and who presumably stood to gain most from the percent plan. These results show that the ban on race-sensitive admissions had a chilling effect on application behavior. Assuming no change in each groups' application rates since affirmative action implies that an additional 380 Hispanics and 117 blacks would have applied to UT-Austin in 1997, the year neither race nor class rank preferences were in force. An additional 221 Hispanics and 85 blacks would have applied to TAMU in 1997 had their application rates not dropped. Moreover, during the first four to five years of the top 10% regime, UT-Austin and TAMU would have gained an average of 243 and 691 Hispanic applicants, respectively, had their application behavior remained at the pre-*Hopwood* level. Similarly, UT-Austin and TAMU would have gained an average of 64 and 303 black applicants, respectively. These results are consistent with several other studies showing that admission policies impact application behavior in ways that alter the composition of the aggregate pool (Long, 2004; Brown and Hirschman, 2006; Long and Tienda, 2008a).

The second counterfactual—which assigns white application rates to blacks and Hispanics within policy regimes—implies that an additional 1,525 Hispanics and 768 blacks would have applied to UT-Austin annually under affirmative action. Owing both to growth in the college-eligible minority population, and the larger gaps in application rates, these numbers increase across each successive policy regime. Under the top 10% policy, for example, UT's applicant pool would include an additional 2,604 Hispanics and 1,274 blacks. That the loss of potential additional Hispanic and black applicants at TAMU is substantially higher than for UT-Austin across all three policy regimes, reflects the larger disparities in their application rates vis-à-vis whites. Specifically, the white-minority application gaps of roughly seven percentage

points translates into an annual loss of 4,683 potential additional Hispanics and 2,023 for blacks under the top 10% policy regime.

[Table 2 about here]

These estimates are likely to be conservative because the TEA data we used to compute school-specific denominators for application rates only include seniors from Texas public high schools. Although private schools account for about five percent of Texas high school seniors (WICHE, 2003: Appendix A, p137), they produce a disproportionate number of college applicants. In 1997, the year neither preference policy was in force, public school seniors accounted for approximately 80 percent of all applications received by UT-Austin and TAMU, and approximately 70 percent of the applicants for both universities during the top 10% period. The remainder of applicants to UT-Austin and TAMU were private school attendees, out-of-state students, international students, or non-traditional students who applied at least one year post-high school.

Admissions and Enrollment

Campus diversity depends not only on application rates, but also admission and enrollment rates. The former are constrained both by policy governing admission criteria and institutional carrying capacity, namely the size of the freshman class that can be accommodated within existing physical and human capital resources. Most of the public controversies focus on the admission decision, but the decisions to apply and enroll are also important determinants of campus diversity. Conditional on admission, financial aid and competing admission offers from private institutions also influence the ethno-racial composition of college campuses.

The top panel of Table 3 shows the percent of applicants admitted to UT-Austin and TAMU across the three policy regimes. At both public flagships, whites' admission rates rose during the no policy period, but returned to affirmative action levels once the top 10% policy was instated. At UT, Asian Americans' admission rates spiked in 1997, but fell under the uniform admission period, yet remained above affirmative action levels. By contrast, Asian admission rates at TAMU declined steadily after affirmative action was rescinded. The repeal of affirmative action did not alter Hispanic admission rates at UT, possibly due to a drop in application rates of marginal students who hedged their bets. However, compared with affirmative action, TAMU Hispanic applicants witnessed a 10 percent decline in admission rates in 1997 and a 15 percent drop in rates under the top 10% regime. Finally, blacks' admission rates fell at both flagships after the repeal of affirmative action and their admission stagnated at 1997 levels at TAMU, but rebounded slightly at UT.

The second panel in Table 3 shows the ethno-racial composition of the admittee pools for the three policy regimes. The first two columns indicate that at UT the shift from affirmative action to the no policy regime benefitted Asians, whose share of admittees rose three percentage points, at the expense of Hispanics and blacks. As intended, the top 10% regime boosted the admit rate for blacks and Hispanics relative to the year of no preferences, but only blacks recovered their relative share of the admittee pool under affirmative action. Based on the composition of the admittee pool, white applicants were the primary casualties under the uniform admission law; their share of admittees fell four percentage points as Asian and Hispanic representation inched up one and two percentage points respectively.

Changes in the composition of TAMU's admission pools under the three regimes differ in several ways. First, the white admission share increased steadily after affirmative action,

averaging 77 percent under the top 10% policy. Second, although Asians benefitted from the repeal of affirmative action, their share of admittees did not continue to rise, as at UT. Third, Hispanic and black representation in TAMU's admittee pool fell under both policies.

[Table 3 about here]

Because the top 10% law is restricted to in-state applicants, the bottom two panels of Table 3 show the proportion of students admitted from Texas public high schools by race (panel 3) and the group shares admitted *among* applicants from Texas public high schools (panel 4). These distributions mirror those observed for all applicants, which is not surprising considering that approximately 80 percent of all students admitted to both universities are from Texas public high schools. Despite the squeeze in admission rates due to growth in applications from Texas graduates, both institutions have reserved about 20 percent of slots for international and out-of-state students.

The right-panel of Table 3 provided parallel information for yield rates, namely the percentage of admittees who enroll at each institution. For all groups, except blacks, enrollment rates rose at UT after affirmative action was rescinded. Under the top 10% regime however, yield rate for white and Hispanic admittees eroded slightly, while holding steady for blacks and Asians. Enrollment patterns at TAMU differ in that the percent of admitted students who enrolled fell during the no-policy period for all groups and rebounded to levels slightly above those under affirmative action for whites, Hispanics, and blacks under the top 10% regime. Because enrollment rates are based on small pools of Hispanics and blacks, the second panel shows that representation of black and Hispanic freshmen at the public flagships was not restored to affirmative action levels under the top 10% regime – at least through 2003. At UT, Asian representation among first-time freshmen rose at the expense of all other groups, while TAMU's

freshman pools became increasingly white. The bottom two panels show that campus diversity is largely driven by the high percentage of enrollees (about 85%) from in-state public high schools to both UT and TAMU. The composition of enrollees based on the full pool and that based on in-state graduates is similar for both institutions and across policy regimes, attesting to the dominance of in-state public school graduates among UT and TAMU freshmen.

In sum, it seems that the shift in admission policy from affirmative action was beneficial for the admission and enrollment of whites and Asian Americans and had adverse effects on the representation of the two underrepresented minority groups. Unconditional on applicant characteristics, such as test scores, Asian Americans were the only group to increase their share of total admissions to UT-Austin after the repeal of affirmative action. Both whites and Asian Americans increased their total share of TAMU admittees and enrollees after post-affirmative action was judicially prohibited. In contrast, the total share of Hispanic and black admittees was highest during the affirmative action period, but both groups faced lower admission prospects compared with whites under the no preference and uniform admission regimes.

Admission Policy and the College Pipeline: A Simulation

Of great interest to policy makers and administrators are the changes in the number of students associated with the various admission regimes. Table 4 reports the results of a simulation that derives the gains and losses of students associated with changes in policy regimes. Specifically, we simulate the number of admitted and enrolled students each group would have gained or lost had affirmative action not been repealed, or if the uniform admission policy did not alter the admittee and enrollee pools. These exercises represent the policy impact in student-units, or the “cost” in admissions (enrollment) to each group associated with change in

their relative shares after the repeal of affirmative action. These simulations account for the carrying capacity of both UT and TAMU throughout the observation period, which is critically important under conditions of rising demand for slots at the public flagships.

The top panel of Table 4 indicates that if the share of students admitted to UT for each group remained at affirmative action levels, an additional 393 Hispanics and 96 blacks would have gained admission to UT during the no policy period. As beneficiaries of the judicial ban on affirmative action, the gain in Asian and white shares admitted translates to 365 and 58 *additional* admittees relative to the number that would have been admitted had race-sensitive criteria not been prohibited. These gains come at the expense of blacks and Hispanics. The simulations for the top 10% regime show that Asians and “others” benefitted from the top 10% law, this time mostly at the expense of whites, who lost 550 potential admits. The top 10% law also cost 204 Hispanic and 14 black admissions.

Parallel analyses for TAMU show that whites and “others,” not Asians, benefitted most from the repeal of affirmative action. TAMU admitted approximately 219 and 506 additional white applicants during the no policy period and top 10% regime, respectively, relative to the numbers that would have been admitted had the judicial ban not altered the composition of the admittee pool. Asian Americans also benefitted from the repeal of affirmative action at TAMU, but to a lesser degree than whites. As occurred at UT, the repeal of affirmative action cost TAMU black and Hispanic admittees. If their admission shares had remained at affirmative action levels, TAMU would have gained 366 and 493 additional Hispanic admits during the no policy period and the top 10% regime, respectively. The comparable cost of black admittees is 173 and 253, respectively, during the no policy and top 10% regimes.

[Table 4 about here]

The bottom panel of Table 4 reports changes in yields -- the measure of actual campus diversity resulting from the conditional probability of matriculating, conditional on applying and gaining admission. Again, the baseline for these calculations are the enrollment group shares achieved under affirmative action. The relative costs are similar, except that absolute numbers are lower because students apply to multiple institutions but ultimately enroll in only one institution to which they gain admission. Whites and Asians gained 32 and 204 freshmen slots at UT when affirmative action was repealed, but under the top 10% regime, whites lost 354 seats in the freshman class while Asians more than offset their gains. The repeal of affirmative action cost black and Hispanic admittees 160 and 83 slots in UT's freshman classes, respectively, but only 51 and 30, on average, under the top 10% regime. Echoing the admission story, whites were the primary beneficiaries of the repeal of affirmative action, netting 142 seats in 1997, and a whopping annual average of 340 seats under the uniform admission regime. Hispanic and black admittees to TAMU incurred high losses in freshman class seats, which averaged 271 and 120 per year once the top 10% law was in place.

Explaining Group Differences in Admission and Enrollment Rates

Although informative, the findings discussed above do not account for group differences in characteristics associated with college admission prospects. In particular, the observed minority-white gaps likely reflect group differences in academic outcomes and high school quality, which is related to application behavior and college readiness (Niu and Tienda, 2008; Koffman and Tienda, 2008). Thus, in the next set of analyses we examine how admission and enrollment outcomes change after accounting for variation in applicants' SAT and ACT test scores, class rank, and high school attributes associated with college-going behavior, such as

high school size, public-private status, and percent of students ever economically disadvantaged (see Long and Tienda, 2008a; 2008b).

The first model predicts the proportion of students admitted to both UT and TAMU, essentially replicating the findings reported in the top panel of Table 3 as proportions rather than percentages. These estimates serve as benchmarks to evaluate the relative influence of changes in the academic achievements of applicants in their admission outcomes. At UT, Asians' admission advantage after the repeal of affirmative action was largely due to their higher average test scores and class rank. Comparison of whites and Asians with equivalent test scores yielded similar admission rates under the top 10% regime, but whites had a 2-3 percent edge under affirmative action and the no preferences year. Under the affirmative action regime, Asians' admission advantage at UT was largely due to their higher average test scores and class rank; once comparisons are standardized statistically, the admission advantage accrues to whites and it is unaltered by taking into account differences in the types of high schools they attend.

Both blacks and Hispanics also enjoyed an admission advantage at UT under affirmative action, which is evident in the large positive coefficients (net deviations from the white rank) derived from model 2 that compares applicants with comparable test scores and class rank. Once race preferences were judicially banned, both Hispanics and blacks lost their admission advantage; black applicants were 17 percent less likely and Hispanics 13 percent less likely than comparably achieving whites to gain admission to UT. Under the top 10 percent regime, the admission prospects of blacks and Hispanics improved, but remained below their white counterparts largely because they are less likely to qualify for automatic admission in both integrated and segregated schools (Tienda and Niu, 2006), and because they average lower test

scores among those who do not qualify for the admission guarantee. Taking into account group differences in high school characteristics altered the main patterns only marginally.

[Table 5 about here]

Results for TAMU parallel those for UT with three notable differences. First, Asians did not enjoy an admission advantage under any of the policy regimes. That is, conditional on application to TAMU, Asian students were less likely to be admitted compared with whites with comparable test scores and class rank. Their lower admission chances, moreover, continued under the no preference and top 10% policy regimes. Second, compared with UT applicants under affirmative action, black and Hispanic TAMU applicants enjoyed much larger admission advantages—on the order of 17 to 20 percent—relative to white applicants with comparable credentials. Furthermore, Hispanics' admission chances were lower than comparably achieving white applicants by almost as much—even more for African Americans—once race preferences were outlawed. Third, under the uniform admission law, the admission prospects of black and Hispanic TAMU applicants were not much better than under the no preference regime, which is not the case at UT.

The right-hand panel estimates enrollment prospects conditional on admission after taking into account group differences in high school achievement and high school attributes that influence the likelihood of enrollment. Because the enrollment decision depends both on family financial resources as well as competing offers, neither of which we can observe, the statistical controls serve as crude proxies for group differences in resources and college climate of high schools.

Comparisons between institutions reveal sharp differences in enrollment behavior among minority groups. Under affirmative action, Asians admitted to UT were marginally more likely

to enroll there compared with similarly situated whites—on the order of 1 to 2 percent. At TAMU, however, Asians admitted prior to the judicial ban on affirmative action were about 23 percent less likely to enroll compared with equally achieving whites. These differences in enrollment behavior were moderated appreciably during the year that no preferences were in force. At both institutions, admitted Asian students were 1 – 2 percentage points less likely to enroll than their white counterparts. Under the uniform admission regime, Asian enrollment behavior differed by institution; they were more likely to enroll at UT, conditional on admission but less likely to do so at TAMU.

Enrollment behavior of Hispanic admittees to both public flagships resulted in lower yields vis-à-vis whites under affirmative action. Once the race preferences were outlawed, however, the Hispanic yield rate was marginally higher than that of whites at both institutions. Most likely this reflects the higher selectivity of high achieving Hispanics admitted post-Hopwood, but other unobservables, such as qualification for merit and means-tested financial aid, also contributes to this result. Mimicking Asian enrollment behavior under the uniform admission regime, Hispanics admitted to TAMU were less likely than whites to enroll, but they were more 2 to 4 percent more likely than admitted whites to enroll at UT.

Throughout the period under consideration, African Americans admitted to the Texas public flagships were significantly less likely than their white counterparts to enroll at either institution. When race preferences were allowed, the black yield rate trailed that of whites by about 8 percentage points at UT and about 20 percent at TAMU. The ban on affirmative action lowered the yield of African Americans at UT, but there were only trivial differences at TAMU. This seemingly equal yield is deceptive, however, because it largely reflects the tiny numbers admitted, as revealed by Table 3. The small black-white enrollment gap at TAMU under the

uniform admission regime also reflects the low numbers of African American students who apply and are admitted to TAMU, where the share of blacks' enrollment has not recovered to pre-*Hopwood* levels. By contrast, the black yield at UT is well above that observed under affirmative action.

To summarize, the shift in admission regimes from affirmative action to no preferences resulted in lower admission rates to both flagships for Asian Americans, Hispanics, and blacks relative to whites, even when comparisons are standardized to students with comparable achievements and similar high schools. Furthermore, changes in admission rates to both flagships after affirmative action was rescinded and the top 10% regime implemented are negligible for statistically comparable minority groups. Inclusion of statistical controls for student achievements and high school characteristics does little to alter group differences in yield rates relative to those observed in Table 3.

Summary and Discussion

Our analyses show that changes in Texas college admission policies have been highly consequential for racial minority groups, the largest and fastest growing segment of the State's population. Using data from the Texas Education Agency and from the administrative records of both UT-Austin and TAMU, we evaluate how white, Asian American, Hispanic, and black students fared across three policy regimes: affirmative action, no-preference period, and the top 10% regime. Although it is commonplace to focus on admission and enrollment outcomes, our empirical analysis underscores that these outcomes are highly conditioned by the decision to apply (Long and Tienda, 2008a; Koffman and Tienda, 2008). This conclusion echoes that

reached by Brown and Hirschman (2006) based on the experience of the State of Washington, where use of race preferences in college admissions was outlawed by voters.

The empirical analyses produce three major findings. First, Hispanics and blacks had lower application rates to the Texas flagship universities after affirmative action was banned; moreover, owing to rapid growth in the number of high school graduates, their disadvantage in percent of applicants relative to whites grew over time. Although the declines in application rates to both UT-Austin and TAMU averaged one percent or less, this implies an annual loss in Hispanic applications that range from 240 at UT-Austin to nearly 700 at TAMU. The estimated loss of black applicants ranges from over 60 to UT to over 300 to TAMU. Second, for both Hispanics and blacks, the admission rate to both UT-Austin and TAMU fell after the ban on affirmative action and reached its lowest point under the top 10% regime. This finding implies that the number of underrepresented minorities eligible for enrollment to Texas flagship universities is reduced even further—a compounding of application and admission disadvantages that translates to fewer potential enrollees. Third, even with the declines in admission rates for Hispanics and blacks since the repeal of affirmative action, our results suggest that these groups would gain substantial representation in Texas flagship universities if they had retained their share of admits during affirmative action.

This result has profound policy implications that transcend admission regimes because they redirect attention away from the seemingly irresolvable differences about race or class rank preferences to encouraging greater numbers of qualified applicants to apply for admission. Koffman and Tienda (2008) show that graduates from affluent schools are significantly more likely to seek admission at the public flagships compared with their cohorts who graduate from high schools that serve students of low to moderate socioeconomic status. Our simulations

indicate that equalizing their application rates with those of white graduates would have yielded 2,604 and 4,683 additional Hispanic applications annually during the top 10% regime for UT-Austin and TAMU, respectively. Blacks would also have experienced an increase in applicants of over 1,200 to UT-Austin and over 2,000 to TAMU during this same period.

That the expansion of the post-secondary education system has failed to keep up with the growth of the college-eligible population represents a formidable policy challenge for the future for several reasons. First, competition for access to the State's public flagships will continue to intensify in Texas, at least through 2015 (Tienda, 2006; WICHE, 2008). Second, legal and statutory challenges to race preferences and the top 10% plan show no sign of abating (Haurwitz, 2008; Schmidt, 2008). Third, Texas invests less of its GDP on public education than several other states that have excellent public universities.¹² Over the long term the post-secondary system will expand to accommodate slower growth of high school graduates, but the State faces enormous opportunity costs for continued underinvestment in the education of its fastest growing population. Texas comptroller Strayhorn (2005) estimated a 500 percent return on every dollar invested in the state's higher education system. Educational underinvestment is seldom invoked as the culprit for the rising number of applicants denied admission to a four-year institution in the state, yet it is the ultimate cause of the college squeeze and a source of economic vulnerability for the state in the future.

In the short term, however, cultivating college-going cultures at under-resourced high schools is a potential high-impact, relatively low cost strategy to raise college application rates for underrepresented minorities. The Longhorn and Century Scholars programs developed by UT and TAMU, respectively, enabled economically disadvantaged top 10% graduates to attend their

¹² In a recent communication to alumni (June, 2008), President Powers noted that in 2006, Texas spent 3.35% of GDP on public education, including post-secondary institutions, compared with 4.24% by California, 4.49% by Michigan, and 4.05 by North Carolina.

institutions. As important, these programs were accompanied by an aggressive outreach program that promises to increase students' orientation to college. Domina (2007) shows that the Longhorn and Century programs were associated with lower absenteeism and higher completion of standardized tests required by selective post-secondary institutions. Finally, it warrants emphasizing that an admission guarantee can not guarantee enrollment, particularly for students from limited economic means. That Hispanic and black students are disproportionately concentrated in low resourced high schools requires strong financial aid programs to ensure that successful applicants actually enroll and graduate from college.

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Table 1. Average Application Rates to UT-Austin and Texas A&M from Texas Public High School Seniors, 1993-2003

Policy (Years)	University of Texas at Austin						
	Whites	Asian	A – W	Hisp.	H – W	Black	B – W
Affirm. Act. ('93-'96)	7.19	30.76	23.57	3.61	-3.58	2.72	-4.47
No Policy (1997)	6.56	29.79	23.23	2.77	-3.79	2.09	-4.47
Top 10% ('98-'03)	7.13	29.78	22.65	3.26	-3.87	2.48	-4.65

Policy (Years)	Texas A&M University						
	Whites	Asian	A – W	Hisp.	H – W	Black	B – W
Affirm. Act. ('93-'96)	9.48	11.77	2.29	3.23	-6.25	2.95	-6.53
No Policy (1997)	9.30	14.27	4.97	2.74	-6.56	2.50	-6.80
Top 10% ('98-'02)	9.06	9.81	0.75	2.22	-6.84	1.88	-7.18

Note: Percentages are for the students enrolled in 942 public high schools in operation in Texas from 1993 through 2003.

Table 2. Estimated Additional Applicants for Underrepresented Minorities under Two Scenarios

If each groups' application rates remained at affirmative action Levels ^a

Policy (Years)	University of Texas at Austin		Texas A&M University	
	Hisp.	Blacks	Hisp.	Blacks
No Policy (1997)	380	117	221	85
Top 10% Annual Avg.	243	64	691	303

If each group had Whites' application rates for each policy regime ^b

Policy (Years)	University of Texas at Austin		Texas A&M University	
	Hisp.	Blacks	Hisp.	Blacks
Affirm. Act. Annual Avg.	1,525	768	2,668	1,121
No Policy (1997)	1,702	841	2,948	1,281
Top 10% Annual Avg.	2,604	1,274	4,683	2,023

Note: Data for TAMU Exclude 2003.

^a The following formula was employed for each cell: Additional Applications = (GroupGrads * GrpAppRtAA – GrpApps), where GroupGrads are the group specific total number of high school graduates during the given policy regime, GrpAppRtAA is the group specific application rate during Affirmative Action, and GrpApps are the group specific total number of applicants from Texas public high schools during the same policy regime. Numbers were calculated from Texas Education Agency data.

^b The following formula was employed for each cell: Additional Applications = (GroupGrads * WhtAppRt – GrpApps), where WhtAppRt is the White application rate during the given policy regime.

Table 3. Admission and Enrollment Rates, and Share Admitted and Enrolled at UT-Austin and Texas A&M across Three Admission Regimes

Group	Admitted						Yield					
	UT-Austin			Texas A&M University			UT-Austin			Texas A&M University		
	(Admitted / Applicants) x 100						(Enrolled / Admitted) x 100					
	Affirm. Action ('90-'96)	No Policy (1997)	Top Ten Percent ('98-'03)	Affirm. Action ('92-'96)	No Policy (1997)	Top Ten Percent ('98-'02)	Affirm. Action ('90-'96)	No Policy (1997)	Top Ten Percent ('98-'03)	Affirm. Action ('92-'96)	No Policy (1997)	Top Ten Percent ('98-'02)
Whites	71.7	83.2	71.4	73.9	79.9	74.0	59.1	64.0	61.7	61.8	57.4	64.6
Asians	74.3	84.4	77.5	73.2	72.4	66.1	60.8	64.0	63.3	38.3	32.2	36.5
Hispanics	74.9	75.4	67.7	86.2	76.2	70.8	54.5	64.3	60.2	50.3	46.5	51.7
Blacks	64.0	58.0	59.9	83.8	64.5	64.7	57.7	56.3	56.6	46.2	41.1	48.6
Group Share of Total Admitted						Group Share of Total Enrollees						
Whites	.651	.656	.613	.730	.749	.766	.664	.668	.623	.782	.805	.822
Asians	.128	.160	.171	.052	.060	.057	.134	.163	.179	.034	.036	.035
Hispanics	.159	.124	.145	.144	.112	.109	.150	.127	.144	.125	.098	.094
Blacks	.040	.032	.039	.051	.036	.033	.040	.028	.036	.041	.028	.027
Totals	.978	.972	.968	.977	.957	.965	.988	.986	.982	.982	.967	.978
Proportion of Total Admitted from In-State Public HS						Proportion of Total Enrollees from In-State Public HS						
Whites	.513	.497	.479	.612	.625	.645	.561	.551	.524	.696	.717	.729
Asians	.107	.132	.141	.042	.050	.047	.122	.147	.161	.031	.033	.032
Hispanics	.140	.106	.126	.119	.094	.093	.133	.111	.130	.109	.083	.083
Blacks	.036	.027	.035	.041	.031	.029	.037	.026	.034	.036	.025	.025
Totals	.796	.762	.781	.814	.800	.814	.853	.835	.849	.872	.858	.869
Group Share of Total In-State Public HS Admits						Group Share of Total In-State Public HS Enrollees						
Whites	.643	.650	.609	.745	.761	.779	.656	.657	.614	.793	.816	.827
Asians	.134	.172	.179	.051	.061	.057	.143	.175	.188	.035	.038	.036
Hispanics	.175	.138	.160	.145	.114	.112	.155	.132	.153	.124	.094	.094
Blacks	.045	.035	.045	.050	.037	.035	.043	.031	.040	.040	.029	.028
Totals	.997	.995	.993	.991	.973	.983	.997	.995	.995	.992	.977	.985

Note: Number of observations is 224,893 and 163,027 for UT-Austin and TAMU, respectively. Group share of total admitted = group specific admits / total admits; proportion of total admitted from in-state public HS = group specific in-state public HS admits / total admits; group share of total in-state public HS admits = group specific in-state public HS admits / total in-state public HS admits. For the analogous categories of enrollment, we replace the admitted information in the previous formulas with enrollment information.

Table 4. Estimated Changes in Admits and Enrollees under the Null Hypothesis of “No Change” since Affirmative Action ^a

Change in admits if shares of students admitted remained at affirmative action levels										
Group	University of Texas at Austin					Texas A & M University				
	Af. Act. Shares	No Policy Regime		Top 10% Regime		Af. Act. Shares	No Policy Regime		Top 10% Regime	
		% Δ in Shares	Cost in Admits	% Δ in Shares	Cost in Admits		% Δ in Shares	Cost in Admits	% Δ in Shares	Cost in Admits
Whites	.651	0.5	-58	-3.8	550	.730	1.9	-219	3.6	-506
Asians	.128	3.2	-365	4.3	-626	.052	0.8	-96	0.6	-83
Hispanics	.159	-3.5	393	-1.4	204	.144	-3.1	366	-3.5	493
Blacks	.040	-0.8	96	-0.1	14	.051	-1.5	173	-1.8	253
Other	.022	0.6	-66	1.0	-142	.023	1.9	-224	1.1	-157
<i>Totals</i>	<i>1.000</i>	<i>0.0</i>	<i>0</i>	<i>0.0</i>	<i>0</i>	<i>1.000</i>	<i>0.0</i>	<i>0</i>	<i>0.0</i>	<i>0</i>

Change in enrollees if shares of admitted students who enrolled remained at affirmative action levels										
Group	Af. Act. Shares	No Policy Regime		Top 10% Regime		Af. Act. Shares	No Policy Regime		Top 10% Regime	
		% Δ in Shares	Cost in Enrollees	% Δ in Shares	Cost in Enrollees		% Δ in Shares	Cost in Enrollees	% Δ in Shares	Cost in Enrollees
Whites	.664	0.5	-32	-4.1	354	.782	2.3	-142	4.0	-340
Asians	.134	2.9	-204	4.5	-389	.034	0.2	-13	0.1	-7
Hispanics	.150	-2.3	160	-0.6	51	.125	-2.7	171	-3.1	271
Blacks	.040	-1.2	83	-0.3	30	.041	-1.3	80	-1.4	120
Other	.012	0.1	-7	0.5	-46	.018	1.5	-96	0.4	-44
<i>Totals</i>	<i>1.000</i>	<i>0.0</i>	<i>0</i>	<i>0.0</i>	<i>0</i>	<i>1.000</i>	<i>0.0</i>	<i>0</i>	<i>0.0</i>	<i>0</i>

Note: Number of observations is 224,893 and 163,027 for UT-Austin and TAMU, respectively. Data for TAMU Exclude 2003

^a Cost in admits = (total regime admits x group specific affirmative action share) – groups’ actual admits during regime. Cost of admits is divided by 5 for UT and 4 for TAMU to obtain the yearly average during the top ten percent regime. The previous formula is repeated using the analogous information for enrollment.

Table 5. Estimates of Policy Effects on Admission and Enrollment at UT and TAMU

Ind. Variables	Admitted						Enrolled ^a					
	UT-Austin			TAMU			UT-Austin			TAMU		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
<i>Group (Whites Ref.)</i>												
Asians	.026	-.028	-.028	-.007	-.036	-.024	.010	.025	.012	-.235	-.224	-.223
Hispanics	.032	.133	.121	.123	.179	.169	-.046	-.092	-.095	-.115	-.154	-.148
Blacks	-.077	.108	.104	.099	.205	.199	-.030	-.091	-.086	-.156	-.209	-.207
<i>Policy by Group</i>												
No Policy(NP)	.115	.123	.120	.059	.056	.044	.061	.062	.039	-.044	-.048	-.065
NP x Asians	-.014	-.020	-.020	-.067	-.066	-.067	-.014	-.015	-.019	-.017	-.008	-.010
NP x Hisp.	-.110	-.125	-.138	-.160	-.161	-.176	.019	.030	.018	.006	.013	.017
NP x Blacks	-.175	-.170	-.168	-.253	-.244	-.247	-.115	-.105	-.113	-.007	.000	.001
Top 10%(TT)	-.003	-.004	-.030	.001	.003	-.004	.058	.067	-.014	.028	.025	.008
TT x Asians	.035	.033	.040	-.072	-.068	-.069	.011	.008	.023	-.046	-.036	-.037
TT x Hisp.	-.069	-.081	-.088	-.154	-.156	-.169	.026	.026	.043	-.015	-.011	-.007
TT x Blacks	-.039	-.072	-.079	-.192	-.196	-.205	-.022	-.024	-.015	-.005	.001	.004
<i>Academics</i>												
SAT/ACT ^b	---	.010	.011	---	.008	.009	---	-.004	-.003	---	-.004	-.004
TT Class rank	---	.282	.261	---	.309	.274	---	-.062	-.060	---	-.014	-.013
Constant	.717	-.575	-.679	.739	-.265	-.415	.536	1.057	.976	.618	1.107	1.120
R ²	.008	.305	.326	.009	.245	.259	.005	.027	.106	.024	.041	.045
<i>Control Vector</i>	N	N	Y	N	N	Y	N	N	Y	N	N	Y
N =	210,037			156,848			151,900			117,060		

Note: Control vector includes sex, class size, percent of high school receiving free or reduced lunch, and public/private status of high school. Indicator variables for students with missing values on each covariate are also included in the regressions.

^a Data excludes students who enrolled but were not granted formal admission (e.g., waitlisted, deferred enrollment), which corresponds to 3 percent of the sample at UT.

^b SAT/ACT are composite scores divided by 10; ACT scores were converted to the SAT scale. Therefore, the estimates represent the average change in the outcome associated with every 10-point increase in test scores along the SAT scale.