Ethnicity, Citizenship and In-state Residence: Analyses of Postsecondary Admission and Choices of Major after In-state Tuition for Undocumented (H.B. 1403).

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Introduction

The choice of major in post secondary education has been studied for some time, particularly gender gaps (Staniec, 2004; Leigh and Gill, 2000; Turner and Bowen, 1999; Ware and Lee, 1988; Polachek, 1978; among others) and more recently racial gaps (Staniec,2004). Given that selectivity of admissions and students' choices of major define labor market outcomes and returns, the determinants of these decisions are worth studying, more so if these are related not to students' cognitive capacities, but other individual characteristics that have been traditionally deterministic of educational inequities. Such decisions are usually informed by preferences, previous educational attainment (selection, plus preparation, e.g. AP courses in specific fields), and expected labor market returns (Turner and Bowen, 1999).

Turner and Bowen (1999) found that SAT scores explain only part of the observed gender gap in choice of major and gender differences have remained strong over time. Although not the focus of this study, there have also been relevant studies on the impact of family background on the choice of college major, particularly in terms of gender differences. Leppel, Williams and Waldauer (2001) find that male and female students with parents in professional/executive professions are more likely to opt for majors in Science, Engineer and Mathematics.

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Comparing the amount of women choosing sciences or engineering today versus three decades ago (Maple and Stage, 1991), even though gaps persist today, pre-collegiate preparation have appeared to shift the importance of factors such as individual expectations and previous academic achievement (Turner and Bowen, 1999). Women today remain underrepresented in these fields. Improvements in choice of major by gender accounted for around 10 percent of the narrowing gender wage gap at the turn of the Century (Leigh and Gill, 2000).

Staniec's (2004) analyses on race using NELS finds that race and gender both have significant effect on the choice of major. He also found a significant effect for ability measured by students proficiency in math and science in high school, and he found that students' proficiency in these areas were more likely to choose related fields and that higher math scores decreased the likelihood of choosing humanities and fine arts. Importantly, Staniec also found no effect of socio-economic variables (measured by parental education) for males. The author found that gender gaps tend to disappear once one takes into account differences in returns in the labor market, except for Blacks.

Even though the gender wage gap has been the focus of various studies, and race addressed by those mentioned above, no analyses exist on choices of immigrant populations in post-secondary education that relate to undocumented immigrants. Mostly, because up until recently foreign students without legal status were denied access to higher education except for international students. In 2001 Texas passed H.B. 1403, which gave undocumented immigrants the status

required for access to higher education at instate tuition levels[3]. That is, after a year of gainful employment and/or having graduated from a Texas high school, undocumented youth are provided eligibility to enroll in Texas' postsecondary system (all public junior, community and senior colleges and universities, public health service centers and Technical Institutes)[4]. Therefore, even within the *Hopwood* context, which decreased the share of Black and Hispanic applicants admitted to flagship institutions (Long and Tienda, 2007), Texas provides a unique opportunity to study ethnic differences in higher education under the assumption that H.B. 1403 increased the heterogeneity of the Hispanic population in postsecondary institutions. Additionally, long term, the law may have opened the state for access to higher education to new waves of immigrations, which continue to be a main source of Hispanic population growth in the U.S. (Tienda and Mitchell, 2006).

Hispanics are the fastest growing segment of the US population at a rate of 1.5 million annually and currently amounting to 40 million (Tienda and Mitchell, 2006a and 2006a).Tienda and Mitchell report a youthful age structure, a large number of undocumented, low education levels, and a disproportionate concentration of low skill, low wage jobs and about two thirds of Mexican

[3] Independent individuals aged 18 years and older who are gainfully employed in Texas for twelve months before registration in a public institution of higher learning are entitled to resident status while maintaining legal Texas residence…. Under Texas House Bill 1403 (effective 2001) addressing the issue of undocumented students qualifying for resident status for tuition purposes, international students who meet all of the following requirements and do not establish a residence outside Texas will qualify for TX residency regardless of INS status: 1) graduate from a TX high school (public or private) or receive a GED after attending for three consecutive years; 2) live with a parent, legal guardian or conservator during that time; 3) register as an entering student in a higher education institution not earlier than the Fall 2001 semester; and 4) sign an affidavit stating that they meet the above qualifications and will apply for permanent residency at the earliest opportunity they are eligible to do so. …An alien living in the U.S. under a visa permitting permanent residence or who is permitted by U.S. law to establish a domicile in this country has the same privileges of qualifying for resident status as a U.S. citizen. (The College Board. Guide to State Residency Requirements: Policy and Practice at U.S. Public Colleges and Universities. Texas. http://www.collegeboard.com/about/association/international/pdf/sr_TX01.pdf)

[4] Texas was among the first of several states including California, Illinois, Kansas, New Mexico, New York, Oklahoma, Utah and Washington to pass such a law. Other states like Rhode Island and North Carolina have rejected initiatives like this for years.

origin. Moreover, they state that if immigration continues its current gradual trend, it is likely that births will surpass immigration as the principal component driving growth. As a group, they are not monotonic, differing generationally (driven by fertility growth), origins, immigration status, and language fluency.

Kaushal (2008) examined the effect of in-state tuition laws for undocumented students on Mexican adults using Current Population Survey data between 1997 and 2005 (rotation groups) which provide citizenship status of foreign-born populations and country of origin and date of arrival[5]. In a multi-state panel analysis, Kaushal finds that the policy increases college enrollment for the population studied (2.5 percentage point).

In Texas, it was estimated that before the legislation, about 60,000 students per year could benefit from access, and in 1998, the number of dropouts in the Texas system was of 1.2 million, partly accounted for lack of access to higher education[6]. Such increasing Hispanic demographics through birth growth and immigration, and the opportunity given to the latter segment of the Hispanic population motivates our interest in how the legislation has altered options for citizens and non-citizens, in the context of the growth of the foreign born population (particularly Hispanics) in Texas. We focus on citizenship, residence and race as constructs, disregarding in this study others, such as origin, generation, or language fluency that are likely to be as important in determining choices of major as the ones we are studying. Our choices are limited by the data.

[5] Self reported data collected on citizenship status is likely to have a higher measurement error than other types of self-reported data. (Kaushal, 2008: p.775-6)
[6]College Tuition and Undocumented Immigrants. National Conference of State Legislatures. www.ncsl.org/programs/educ/undocimmigrant.htm

This paper attempts to measure the extent to which there are racial differences in choices of major, whether there are citizenship and in-state residence differences in choices of major, and in the Texas context, how the legislation that has increased access to higher education to foreign-born populations has altered choices. We assume the legislation alters predominantly two things: access to higher education and post-college opportunities in the state (by changing perceptions about foreign-born populations) and therefore major choices will reflect altered opportunities. The legislation might affect not only foreign-born populations might the cohorts by altering college demographics. We measure the impact pre- and post-legislation through a difference-in-difference two-step model on the admissions selection process and students behavior/preferences as measured through their first major choice. In comparison to bordering states, it is likely that in a long run, this state will have a comparative advantage for foreign-born populations, altering the composition of the overall college population even further. This study includes three pre-treatment years and three post-treatment years only.

Based on Staniec's model (2004), we analyze race and citizenship to differentiate among types of immigrants. Building from prior evidence we specify the choice of major as a function of preferences, educational achievements (preparation, e.g. AP courses), and selection on admission. This paper focuses on the determinants of the first college major choice at two public Texas institutions, University of Texas at Austin (AU) and Texas Tech University (TT). We concentrate on three student attributes, their race, their citizenship, and their in-state residence status, in an attempt to explore different cohorts of immigrants and in particular, post-H.B. 1403. We are not able distinguish immigrants from non-immigrants nor their legal status, but we analyze residence status and citizenship status as alternative constructs to immigrant status. We

include these in parallel to race self-identification focusing on the Hispanic non-citizen group as a proxy to identify immigrant, non-citizens, and non-residents as a proxy for immigrants without legal status. We assume that differences in choices matter as they will determine labor market outcomes, and non-citizen and non-resident status influence such choices. Relative to Whites, Blacks, Hispanics and Asians are less likely to be admitted to UT Austin and TX Tech and that after H.B. 1403 Blacks and Hispanics cohorts evidence a slight increase in the probability of admission only at UT Austin. These analyses partially account for selectivity in the admissions process into higher education using race and information on previous educational experiences and achievement. Analyses of residence and citizenship cross-groups reveal that relative to resident citizens, foreign-born populations and nonresident natives show a lower probability of admission, post-H.B. 1403 cohorts improving. We find that African Americans, Hispanics and Asians are more likely to enroll in SE&Ms than Whites, and less likely to do so in other fields. Post-H.B. 1403, Hispanic and Blacks cohorts at UT Austin evidence an increased probability of SE&M choice of major while in TX Tech such probabilities decreased. Non-citizens are also more likely to enroll in SE&Ms and Texas residents are less likely to enroll in SE&Ms at UT Austin with no differences observed pre and post-legislation. Cross-group estimations reveal that relative to native residents, foreign-born residents, and native non-residents are appreciable more likely to enroll in SE&M majors and less likely to enroll in social science majors.

Data

UT Austin[7] is one of the top five producers of undergraduate degrees for minority students and considered a top college for Latinos. The university charges tuition between $4,045 and $4,677

[7] http://bealonghorn.utexas.edu/whyut/whyut/index.html

(depending on the major) for residents and $13,336-$15,385 to non-residents[8]. The 2000 freshman cohort of 7,412 students averaged an SAT of 1,230 (2006). Texas Tech[9] charges a tuition (30 hrs) of $4,310 for in-state residents and residents of counties that share a border with Texas (New Mexico and Oklahoma), of $5,210 for other counties of New Mexico and Oklahoma and of $12,650 for other non-residents. The average reported freshman class' SAT is 1,092 and the freshman class reported is 4,515. Barron's Profiles of American Colleges (1996) categorizes UT as 'very competitive' and TTU as 'competitive' (as cited in Tienda and Long, 2007). UT Austin has had a long standing history of serving Latinos, with a total enrollment of over 50 thousand it served around 17% Hispanic and 4.5% Black in 2004[10] (while Texas Hispanic population is around 35%). Texas Tech declares itself to remain in the traditions of a liberal college with a total enrollment of around 27 thousand, with 11% of its student body being Hispanic, and 3% Black[11].

We use administrative data from two Texas public universities -University of Texas at Austin (UT AUSTIN) and Texas Tech University (TX TECH)- assembled by the Texas higher Education Opportunity Project as a part of a multi-year review of college behavior in Texas following the *Hopwood* decision which banned on affirmative action[12]. The baseline applicant files provide data on personal background, educational background, and application data. We use information on applicants' background, term for which admission is desired, sex, ethnicity,

[8] http://www.utexas.edu/tuition/costs.html
[9] http://www.admissions.ttu.edu/fastfacts.pdf
[10] White teen sues UT over admissions policy. Sugar Land student, in top of class, challenges racial preferences. April 8, 2008, 6:47AM. *Houston Chronicle.* http://www.chron.com/disp/story.mpl/front/5682324.html
[11] Chang, M.J. (2006). *Achieving Institutional Self-Correction through Diversity*. TX: Texas Tech University. http://www.depts.ttu.edu/diversity/Diversity Panel PDF
[12] http://theop.princeton.edu/index.html

Texas residency, admission status, first choice of major, US citizenship status, and several high school characteristics.

For the pooled group of cohorts we are analyzing (2001, 2002 and 2003) the average SAT for UT Austin is of 1,221 and in TX Tech is of 1,107. Students at UT Austin report on average higher levels of father's education but lower levels of mother's education, and higher percentage of reduced or free lunch in the high schools compared with TX Tech, together with slightly higher mean per pupil expenditures. The percentage of African American and students with Indian or Native backgrounds do not differ much, however UT Austin enrolls a larger percentage of Hispanics and Asians than TX Tech. Similarly, UT enrolls a larger percentage of non-citizens.

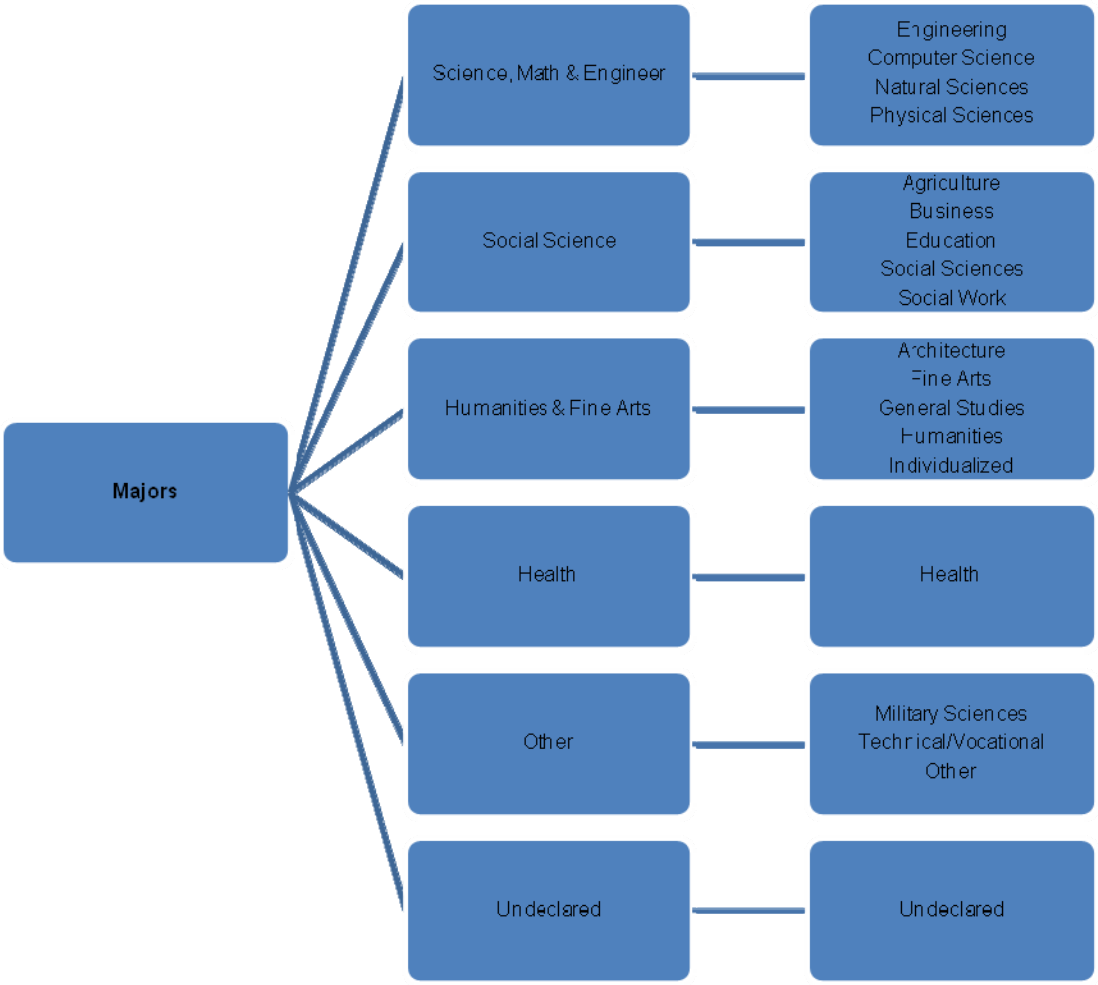
Table 1. Variable means for sample in models.

Variables	UT AUSTIN N=290,416	TX TECH N=152,927
Students' Characteristics		
Male (male)	0.472	0.495
African American (Black)	0.044	0.036
Hispanic (Hispanic)	0.145	0.097
Indian/Native (Ind_Natv)	0.004	0.005
Asian (Asians)	0.192	0.027
Non-citizens (non-citizens)	0.053	0.014
Texas Resident (txresid)	0.961	0.969
Cognitive measures		
High School Percentile Rank (hspctrank_c)	16.091	27.692
Ap math courses passed (apmathp)	0.215	-
Schooling Experiences		
White students in school –th (whiteth)	1.230	1.095
Per pupil expenditures -th. (perpupilexp_cth)	6.024	6.225
Pupil/Teacher Ratio (puptch)	16.091	15.027
No. Free and Reduced Lunch Eligible (frelch)	321.178	241.621
Grade 12 Enrollment – hundreds (gr12)	4.895	4.137

Because we are interested in studying choices of major, and between the two universities, we recoded the majors to six categories from the seventeen divisions existing in the administrative

data. Figure 3 illustrates how the different divisions were recoded into six majors. We report the first four categories only (although models take into account all six choices).

Figure 1.

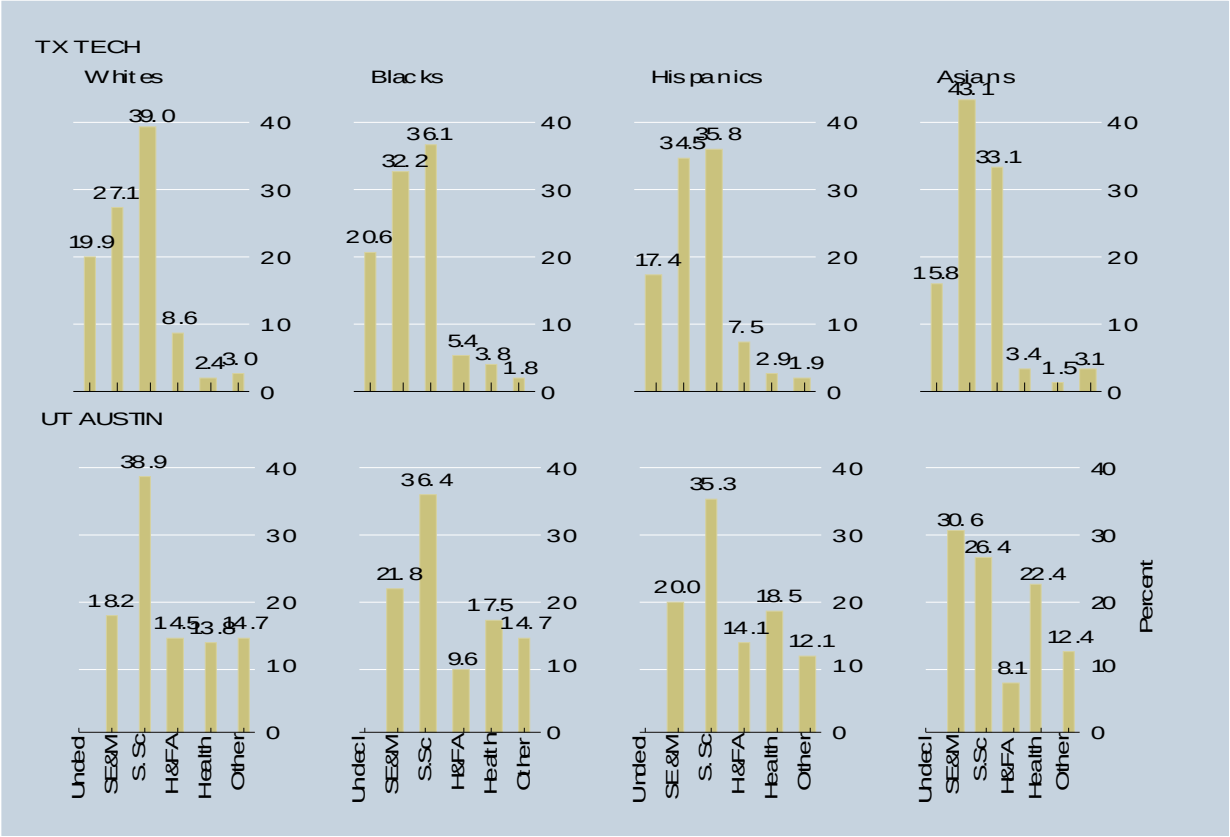


Descriptive

Figure 1 illustrates the distribution of major choice by race across (i) Undeclared, (ii) Science, Math and Engineer (SE&M), (iii) Social Sciences, (IV) Humanities and Fine Arts (HandFA), (V) Health and (VI) Other fields (includes vocational). There are large differences in the representation of minorities in the Social Sciences and enrollment in SE&M throughout. It is worth noting that Black and Hispanics do enroll in higher proportions that Whites in SE&M, and

Asians predominate in this field. Black enrolled in SE&M at a rate of 32 and 22 percent in AUSTIN and TX TECH respectively in the 1998-2003 period, Hispanics enrolled at a rate of 34 and 35 percent respectively, and Whites at a rate of 27 and 18 percent. On the other hand, differences across race are less distinct for the Social Sciences, relative to the overall distributions. There is non-parametric evidence of difference across institutions, e.g. the category for undeclared is not observed in Texas Tech, which might be forcing choices early on, and these could imply a larger variation in the amount of changes in choices of majors throughout the college experience[13].

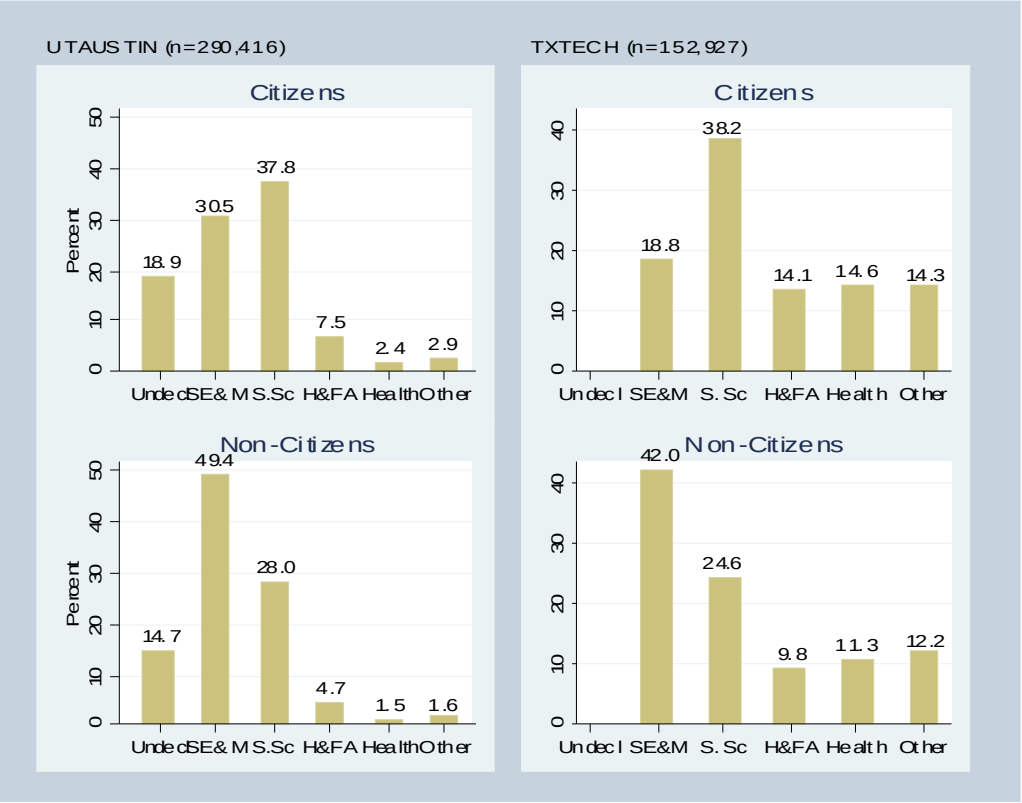
Figure 2. Distribution by First Major and Race, 1998-2003, UT Austin and TX Tech.



[13] See in this volume Dickson, L. College Major Choice and Academic Success in Texas.

Distributions by citizenship evidence even stronger differences with what appear like large concentrations of non-citizens in SE&M fields, with almost 20 percentage-point difference relative to the enrollment of Citizens in SE&M majors. Overall, Citizens appear to be enrolled largely (38 percent) in the Social Sciences and/or related majors, irrespectively of the institution, and 19 to 30 percent choose SE&M majors, depending on the university.

Figure 3. Distribution by First Major and Citizenship, 1998-2003, UT Austin and TX Tech.



Model

This paper attempts to measure the extent to which there are racial differences in choices of major, and the extent to which this relate to citizenship and in-state residence. We use a limited number of additional variables to control for family background and indicators on high school

quality. The latter variables summarize information on lagged events (high school) given that they provide information on school experiences and resources as well as represent cognitive skills accumulated (either due to resources or to children's own capacity).

The data provide considerable power to explain the behavior of youth from different racial backgrounds and residential backgrounds across first major choice of study. We assume individuals arrive at college with a set of preexisting accumulated skills and differentiated resources (individual, family and school) and maximize their utility through the choice of a major among the alternative ones (similar to Staniec, 2004 and Turner and Bowen, 1999):

$$U_{ik} = \max(U_{1i}, U_{2i}, U_{3i}, U_{4i}, U_{5i}, U_{6i})$$

where,

i = students

k=majors (SE&M, Social Sciences, Humanities and Fine Arts, Health, Other, and Undeclared)

Following Staniec (2004, p.554), we use a maximum likelihood multinomial logit model to predict students' first choice of major. For ease of interpretation we report marginal effects[14], where:

$$\Pr(y_i = k) = \frac{\exp(X_i \beta_k)}{1 + \sum_{k}^{K} \exp(X_i \beta_k)}$$

[14] Marginal effects are the effect on the probability of a major being chosen of a discrete variable (for discrete variables) or partial changes at the means (for continues variables) of independent variable on the probability.

Because we are interested in linking the law to behavioral changes across race groups as well as whether citizenship and residence influence major choices, we estimate three alternative variations of this model: a) differentiating race groups and interacting these with a "intent-to-treat" effect that distinguishes years after the legislation was passed (a difference-in-difference approach), to track changes in choices of majors before and after the legislation and b) reproducing this for citizenship and Texas residence to track changes in choices of majors for these particular groups; and c) reproducing with residence and citizenship status combined to differentiate among subpopulations between these two categories.

The rich administrative data permits pooling choices or different cohorts and tracking whether institutional differences exist. Year fix effects control for cohort variations in expected market returns, size, tuition increases and other fluctuations. Estimations are pooled estimates for 1998 to 2003. The category of the dependent variable chosen as the comparison category is 'Health'. Years 2001-2003 are years after the legislation was introduced and we test whether there is an "intent-to-treat" effect for these years, in contrast to the previous years, and the interaction between this effect and our groups of interest.

Fundamental in the literature in post secondary education is that selection bias is central in the comparison among types of institutions and/or student's educational attainment. The nature of the problem of self-selection lies on the choices of students (to attend or not college, to apply, what type of major), and because their choices affect the probability of them attaining a baccalaureate degree, and their labor market outcomes. The selection problem can be understood as a problem of missing observations, in which we do not know for example whether children

who did not attain secondary would have actually enrolled in college have they attained in fact, attained it. Because we do not observe all the high-school pool, but only those that apply, we cannot correct this type of selection, but we can control for selection through admission[15].

Consequently, similar to Turner and Bowen (1999) we take into account previous educational achievement as represented through high school percentile rank and aptitude tests (for UT AUSTIN only). Schooling experiences are represented through per pupil expenditures (thousands), pupil-to-teacher high school ratio, percentage of whites in school, and percentage with free and reduced school lunch. Following Jacoby and Skoufias (2002),[16] we use such information on accumulated educational achievement and previous educational experiences as exclusion restrictions together with current observables on race to identify admission probabilities as a function o past conditional achievement probabilities. Exclusion restrictions require that past probabilities of achievement include lagged variables that have low correlation with present ones (e.g. major choices are not likely related to the percentage of free or reduced lunch and might have a low relation with the percentage of whites in the high school, but will likely affect the probability of achieving high-school, choosing to apply to college and eventual admission). Given our multinomial probit model rather than simultaneous system of equations, we pose a selection equation (logit) in which the probability of admission is modeled as a function of educational achievement and previous educational experiences, gender, race, and residence and citizen status. We then predict the probability of admission and this becomes a

[15] This type of selection correction will provide insight into the direction of the bias of our estimates of major choices. We estimated the models without selection corrections to gain insight into the effect of selection bias on estimates of major choices.

[16] Jacoby and Skoufias (2002) exploit variation in household income and labor market conditions across metropolitan areas and in different time-periods in order to estimate college enrollment decisions in Mexico, taking into account the selectivity of the sample this education level. They estimate the probability of enrolling in college using a bivariate probit model that simultaneously models the probability of having completed higher education, since the later defines the pool (a selective pool) of potential applicants of college.

"selection" variable in our multinomial logit model, turning our estimation process into a two-step one.

The comparison between the college attending cohorts who could have been affected by H.B. 1403 and those hat were not (in both institutions) is done through the most parsimonious difference-in-difference model which controls for a dichotomous variable that takes a value of one if the students is a member of a cohort in after the legislation was passed (aftlegisl=1), the years 2001-2003, and defines pre-treatment as the years preceding the legislation (1998-2000). This type of specification is known as "intent-to-treat" as it models the probability that a cohort might be influenced by the legislation without modeling direct treatment.

Results

Coefficients presented are marginal effects, which allow for comparisons of across models as well as differences among alternative choices. The first set of results presented is two-step estimations of the logit selection model and subsequent multinomial logit models for UT Austin and Texas Tech including the measures described above[17]. Table 3 presents estimated marginal effects and standard errors for gender and race. Whites are the omitted race group.

Relative to Whites, Blacks, Hispanics and Asians are less likely to be admitted to either institution (logit estimations in the first and sixth column). These rates are lower at UT Austin in concordance with its diversity mission. However, the cohort post-H.B. 1403 evidences a decrease in the probability of admission at UT Austin of 7 percent in contrast to a 5 percent

[17] Although not reported, multinomial estimations without corrections for selection evidenced similar trends with smaller marginal probabilities for SE&M and larger the other fields. Two-step estimations evidenced increased probabilities of Black and Hispanics choosing SE&M than Whites.

decrease at UT Austin. While they are no observed differences pre- versus post- H.B. 1403 in the probability of admission for Blacks, Hispanics nor Asians at TX Tech, the race and post-legislation interaction show that Blacks and Hispanics cohorts do evidence a slight increase in the probability of admission at UT Austin.

The statistical significance of differences among race groups[18] provides evidence of the importance of race in the determination of the choices of major. All racial groups tested statistically significantly different from each other except for Asians versus Hispanics and African Americans at UT Austin and Black and Hispanics at TX Tech[19].

By comparison, to gender differences in major choice, the race effect is not small. Similar to Staniec (2004), we find that African Americans are more likely to enroll in SE&Ms as well but unlike, Staniec who does not find differences for Hispanics and Whites based on NELS, at these two Texas Hispanics major choices differ significantly from those of Whites. African Americans, Hispanics and Asians are more likely to enroll in SE&Ms than Whites are, and less likely to enroll in the other fields, although the magnitudes of the differences vary. Specifically, being African American increases the expected probability of enrolling in SE&M by 14 percent at UT Austin, and 10 percent at TX Tech. Differences could be related to disparities in selectivity related to minority status of institutions[20]. Asians, as expected, are more likely to enroll in SE&M than Whites are. Asian background increases the expected probability of a SE&M major

[18] T-tests were conducted after corresponding estimations. Wald tests are not reported.
[19] Like previous literature (Turner and Bowen, 1999; Staniec, 2004) we find a positive marginal effects of males on the expected probability of enrolling in the Science, Engineer and Math (SE&M) fields versus the Social Sciences, Humanities and Fine Arts, and even in the Health fields at both institutions.
[20] Even though I am controlling for selection, estimations are separate across institutions and therefore selection equations behave independent of each other. Tienda and Long, 2007 find that there were slightly different policies and responses in UT and TT (and Texas A&M University) in university admissions post-*Hopwood*.

by 14 percent at UT Austin and 11 percent in TX Tech. Hispanics evidence much smaller effects with being Hispanic increasing the probability of a SE&M major by 7 percent at UT Austin and 11 percent at TX Tech. The higher SE&M probability for Hispanics at TX Tech despite a long-standing history of serving Latinos at UT Austin could be related to TX Tech types of concentrations.

Table 3. Two-step estimations for UT Austin and TX Tech, 1998-2003, Marginal Effects of First Major Choice.

	TX TECH					UT AUSTIN				
	LOGIT	MLOGIT				LOGIT	MLOGIT			
	(1)	SE&M	Social Sc	Hum&FA	Other	(2)	SE&M	Social Sc	Hum&FA	Other
Yadmit		2.154***	-2.570***	0.110***	1.642***		2.173***	-0.153***	-0.347***	-0.167***
		(0.043)	(0.055)	(0.041)	(0.042)		(0.023)	(0.023)	(0.012)	(0.005)
Male	0.010***	0.196***	-0.074***	-0.067***	-0.103***	0.005***	0.223***	-0.095***	-0.032***	-0.030***
	(0.001)	(0.002)	(0.003)	(0.002)	(0.002)	(0.000)	(0.002)	(0.002)	(0.001)	(0.001)
Black	-0.046***	0.144***	-0.166***	-0.075***	0.162***	-0.005***	0.096***	-0.032***	-0.032***	0.005***
	(0.004)	(0.010)	(0.008)	(0.005)	(0.010)	(0.001)	(0.005)	(0.005)	(0.002)	(0.001)
Hisp	-0.029***	0.067***	-0.130***	-0.007*	0.135***	-0.016***	0.109***	-0.035***	-0.019***	-0.001
	(0.002)	(0.005)	(0.005)	(0.004)	(0.006)	(0.001)	(0.003)	(0.003)	(0.002)	(0.001)
Ind/Nat	-0.031***	0.066***	-0.156***	-0.009	0.194***	-0.014***	0.153***	-0.047***	-0.019**	-0.011***
	(0.011)	(0.023)	(0.021)	(0.018)	(0.026)	(0.004)	(0.017)	(0.016)	(0.008)	(0.002)
Asian	-0.013***	0.140***	-0.137***	-0.074***	0.124***	0.003***	0.111***	-0.028***	-0.052***	-0.007***
	(0.003)	(0.010)	(0.009)	(0.006)	(0.010)	(0.001)	(0.003)	(0.003)	(0.001)	(0.001)
Bl*leg	0.001	0.008	-0.003	0.039**	-0.001	0.005***	-0.005	-0.031***	-0.019***	-0.001
	(0.002)	(0.011)	(0.017)	(0.016)	(0.009)	(0.002)	(0.010)	(0.011)	(0.006)	(0.002)
Hisp*leg	0.001	0.027***	-0.017	0.004	-0.011**	0.009***	-0.015***	-0.033***	-0.001	0.002
	(0.001)	(0.007)	(0.010)	(0.007)	(0.005)	(0.001)	(0.005)	(0.006)	(0.004)	(0.001)
Ind*leg	0.011***	-0.066***	-0.088*	0.031	-0.060***	0.004	-0.079***	-0.025	0.029	0.007
	(0.003)	(0.018)	(0.045)	(0.034)	(0.013)	(0.005)	(0.024)	(0.035)	(0.024)	(0.013)
As*leg	-0.001	-0.044***	-0.038*	0.041**	0.027**	0.001	-0.022***	-0.060***	0.014***	0.001
	(0.003)	(0.008)	(0.021)	(0.020)	(0.011)	(0.001)	(0.005)	(0.006)	(0.005)	(0.002)
Aftlegisl	-0.050***	0.098***	-0.330***	-0.038***	0.049***	-0.073***	0.027***	0.037***	-0.009***	-0.001
	(0.003)	(0.006)	(0.005)	(0.004)	(0.005)	(0.002)	(0.004)	(0.004)	(0.002)	(0.001)
Obs	152,927					290,416				

Notes:
(1) Controls: whiteth , perpupilexp_cth, frelch, hspctrank_c, puptch, g12_hu, year dummies, noncitizen, txresid.
(2) Controls: apmathp, whiteth , perpupilexp_cth, frelch, hspctrank_c, puptch, g12_hu, year dummies, noncitizen, txresid.
Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 3 also reports the effect of our binary treatment indicator for cohorts post-legislation, and observed changes in the probabilities of enrolling for the different races. After H.B. 1403, the probability of students enrolling in SE&M versus other fields appears to increase at both institution. This is conditional on a reduced probability of admission, as the effect of the

legislation (Aftlegisl) is to reduce the probability of admission despite a slight positive interaction with minorities. Interactions between race and legislation on the multinomial models tell us that the Hispanic and Black post-legislation cohorts at UT Austin evidence an increased probability of SE&M choice of major. In TX Tech all race cohorts evidence negative probabilities post-legislation.

A second set of estimates focus on citizenship and in-state resident status and interactions with post-legislation years (Table 4). The selection equation that models the probability of admission indicates that residence increases the probability of admission at both institutions between 2 to 4 percent. There is no effect observed for noncitizens at TX Tech, yet it slightly decreases the probability of admission at UT Austin. Cohorts post-H.B. 1403 evidence an overall decrease in the probability of admission in comparison to previous cohorts, and in these years the previous negative effects for noncitizens and positive for residents appear reinforced at UT Austin. No such effect is observed at TX Tech.

Non-citizens are more likely to enroll in SE&Ms at either institution by a rate of 11-12 percent. Texas residents are less likely to enroll in SE&Ms at a rate of 5 percent at TX Tech and 10 percent at UT Austin. While on average treatment (Aftlegisl) increases the probability of enrollment in SE&M by around 8 percent (cohort differences), there are no differences between these cohorts of non-citizens and Texas residents and previous ones in the probability of SE&M enrollment at either institution. However, the probability of enrolling in the social sciences at TX Tech decreased, while the probability of enrolling in humanities and fine arts increased for both

types of populations. Texas residents also evidence a decreased probability of enrollment in the social sciences (4 percent) at UT Austin.

Table 4. Two-step estimations for UT Austin and TX Tech, 1998-2003, Marginal Effects of First Major Choice.

	TX TECH					UT AUSTIN				
	LOGIT	MLOGIT				LOGIT	MLOGIT			
	(1)	SE&M	Social Sc	Hum&FA	Other	(2)	SE&M	Social Sc	Hum&FA	Other
Yadmit		2.143***	-2.559***	0.112***	1.636***		2.167***	-0.150***	-0.350***	-0.167***
		(0.043)	(0.055)	(0.041)	(0.042)		(0.023)	(0.023)	(0.012)	(0.005)
Male	0.010***	0.196***	-0.074***	-0.067***	-0.103***	0.005***	0.223***	-0.095***	-0.032***	-0.030***
	(0.001)	(0.002)	(0.003)	(0.002)	(0.002)	(0.000)	(0.002)	(0.002)	(0.001)	(0.001)
Black	-0.045***	0.145***	-0.163***	-0.068***	0.159***	-0.003***	0.095***	-0.037***	-0.035***	0.005***
	(0.003)	(0.008)	(0.007)	(0.004)	(0.009)	(0.001)	(0.005)	(0.005)	(0.002)	(0.001)
Hisp	-0.028***	0.077***	-0.131***	-0.006*	0.125***	-0.011***	0.100***	-0.039***	-0.018***	-0.000
	(0.002)	(0.004)	(0.004)	(0.004)	(0.005)	(0.001)	(0.003)	(0.003)	(0.001)	(0.001)
Ind/Nat	-0.015***	0.022	-0.117***	0.028*	0.126***	-0.012***	0.129***	-0.043***	-0.011	-0.010***
	(0.005)	(0.015)	(0.018)	(0.015)	(0.018)	(0.004)	(0.015)	(0.014)	(0.007)	(0.002)
Asian	-0.014***	0.113***	-0.143***	-0.067***	0.147***	0.003***	0.107***	-0.038***	-0.050***	-0.007***
	(0.002)	(0.008)	(0.008)	(0.005)	(0.008)	(0.001)	(0.003)	(0.003)	(0.001)	(0.001)
Noncitiz	0.004	0.125***	-0.090***	-0.038***	-0.038***	-0.009***	0.110***	-0.088***	-0.002	-0.003***
	(0.003)	(0.016)	(0.016)	(0.011)	(0.009)	(0.001)	(0.005)	(0.005)	(0.003)	(0.001)
Txresid	0.020***	-0.049***	0.076***	-0.021**	-0.050***	0.038***	-0.098***	0.052***	-0.000	0.011***
	(0.005)	(0.010)	(0.012)	(0.009)	(0.010)	(0.002)	(0.007)	(0.006)	(0.003)	(0.001)
Aftlegisl	-0.050***	0.084***	-0.280***	-0.101***	0.050***	0.005***	-0.075***	0.086***	0.004	0.009**
	(0.008)	(0.016)	(0.016)	(0.011)	(0.014)	(0.002)	(0.010)	(0.011)	(0.005)	(0.004)
noncit_leg	-0.009	-0.027	-0.125***	0.172***	0.016	-0.004**	-0.013	-0.017	0.001	0.005*
	(0.007)	(0.018)	(0.031)	(0.041)	(0.023)	(0.002)	(0.009)	(0.011)	(0.006)	(0.003)
txres_leg	0.000	0.008	-0.082***	0.095***	-0.007	0.002***	0.003	-0.036***	0.009*	0.001
	(0.004)	(0.014)	(0.019)	(0.019)	(0.012)	(0.001)	(0.010)	(0.010)	(0.005)	(0.003)
Obs	152,927					290,416				

Notes:
(1) Controls: whiteth , perpupilexp_cth, frelch, hspctrank_c, puptch, g12_hu, year dummies.
(2) Controls: apmathp, whiteth , perpupilexp_cth, frelch, hspctrank_c, puptch, g12_hu, year dummies.
Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Because the recent legislation changes access to in-state tuition for residents and citizens, rather than addressing these as separate categories a third set of estimations included these as four groups (cross-group estimations): resident citizens (missing group), resident non-citizens (nC_Tx), non-resident citizens (C_nTx) and non-resident non-citizens (nC_nTx).Table 5 presents the marginal effects on the probability of first major choice for these groups together with the marginal effects for race and gender.

The selection equation indicate that relative to resident citizens, all three groups evidence a lower probability of admission to either institution, but that cohorts post-H.B. 1403, show a slight improvement in this lower probability of admission. The exception to this is noncitizens nonresidents at TX Tech.

Relative to citizens that are Texas residents, non-citizens residents[21], non-residents are appreciable more likely to enroll in SE&M majors (29 percent at TX Tech and 10 percent at UT Austin) and less likely to enroll in social science majors. These effects are significantly larger than what we observed for race or citizenship at TX Tech. Non-resident citizens are also more likely to select these majors, but at a much lower probability rate (7 percent at TX Tech and 8 percent at UT Austin), as are non-citizens, non residents.

Post-legislation cohorts appear to evidence a decrease in the probability of enrollment in SE&M majors. Whether this is counterbalanced with an increased in the probability of enrolling in another major depends on the institution. Moreover, while the decrease in the probability of enrollment is of around 3-4 percent for non-citizens Texas residents, and for citizens that are not residents, no effect was found for non-citizens that are not residents. In sum, relative to citizens that are Texas residents, and to previous cohorts, none of these three groups appears to evidence increased probabilities in enrolling in SE&M.

[21] There were no observations in these groups for TX Tech after 2001, which explains the missing interaction.

Table 5. Two-step estimations for UT Austin and TX Tech, 1998-2003, Marginal Effects of First Major Choice.

	TX TECH					UT AUSTIN				
	LOGIT	MLOGIT				LOGIT	MLOGIT			
	(1)	SE&M	Social Sc	Hum&FA	Other	(2)	SE&M	Social Sc	Hum&FA	Other
Yadmit		2.146***	-2.565***	0.114***	1.633***		2.166***	-0.150***	-0.349***	-0.167***
		(0.043)	(0.055)	(0.041)	(0.042)		(0.023)	(0.023)	(0.012)	(0.005)
Male	0.010***	0.196***	-0.074***	-0.067***	-0.103***	0.005***	0.223***	-0.095***	-0.032***	-0.030***
	(0.001)	(0.002)	(0.003)	(0.002)	(0.002)	(0.000)	(0.002)	(0.002)	(0.001)	(0.001)
Black	-0.045***	0.145***	-0.163***	-0.068***	0.159***	-0.003***	0.096***	-0.037***	-0.035***	0.005***
	(0.003)	(0.008)	(0.007)	(0.004)	(0.009)	(0.001)	(0.005)	(0.005)	(0.002)	(0.001)
Hisp	-0.028***	0.077***	-0.130***	-0.006*	0.125***	-0.011***	0.101***	-0.040***	-0.018***	-0.000
	(0.002)	(0.004)	(0.004)	(0.004)	(0.005)	(0.001)	(0.003)	(0.003)	(0.001)	(0.001)
Ind/Nat	-0.015***	0.022	-0.117***	0.028*	0.125***	-0.012***	0.130***	-0.044***	-0.012	-0.010***
	(0.005)	(0.015)	(0.018)	(0.015)	(0.018)	(0.004)	(0.015)	(0.014)	(0.007)	(0.002)
Asian	-0.013***	0.113***	-0.145***	-0.067***	0.149***	0.003***	0.110***	-0.039***	-0.051***	-0.007***
	(0.002)	(0.008)	(0.008)	(0.005)	(0.008)	(0.001)	(0.003)	(0.003)	(0.001)	(0.001)
nC_Tx	-0.013	0.292***	-0.237***	-0.040**	0.036*	-0.009***	0.098***	-0.084***	0.003	-0.003**
	(0.009)	(0.030)	(0.020)	(0.019)	(0.021)	(0.001)	(0.005)	(0.005)	(0.003)	(0.001)
C_nTx	-0.025***	0.068***	-0.108***	0.015	0.076***	-0.038***	0.082***	-0.043***	0.004	-0.011***
	(0.006)	(0.012)	(0.012)	(0.010)	(0.012)	(0.003)	(0.007)	(0.006)	(0.003)	(0.001)
nC_nTx	-0.010**	0.150***	-0.097***	-0.021*	-0.026**	-0.056***	0.363***	-0.230***	-0.046***	-0.017***
	(0.004)	(0.015)	(0.015)	(0.012)	(0.010)	(0.008)	(0.020)	(0.015)	(0.005)	(0.001)
nC_Tx*l	-	-	-	-	-	0.006***	-0.039***	-0.014	0.010	0.007*
	-	-	-	-	-	(0.002)	(0.009)	(0.012)	(0.007)	(0.004)
C_nTx*l	0.002	-0.028**	0.099***	-0.068***	-0.018	0.004**	-0.029***	0.044***	-0.004	0.001
	(0.004)	(0.012)	(0.021)	(0.009)	(0.011)	(0.002)	(0.011)	(0.012)	(0.005)	(0.003)
nC_nTx*l	-0.013**	-0.002	-0.089***	0.048*	0.070***	0.007**	-0.023	0.031	-0.001	0.009
	(0.006)	(0.016)	(0.028)	(0.026)	(0.025)	(0.003)	(0.025)	(0.035)	(0.018)	(0.019)
Aftlegisl	-0.049***	0.097***	-0.330***	-0.035***	0.045***	-0.069***	0.019***	0.028***	-0.006***	0.000
	(0.003)	(0.005)	(0.005)	(0.004)	(0.005)	(0.002)	(0.003)	(0.004)	(0.002)	(0.001)
Obs	152,927					290,416				

Notes:
(1) Controls: whiteth , perpupilexp_cth, frelch, hspctrank_c, puptch, g12_hu, year dummies.
(2) Controls: apmathp, whiteth , perpupilexp_cth, frelch, hspctrank_c, puptch, g12_hu, year dummies.
Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Conclusion

This study examined differentials by race, citizenship and in-state resident status in the choice of college major. We use administrative data from two flagship institutions in Texas, and are able to provide analysis that are (a) current, (b) compare race and (c) analyze citizenship and in-state residence as potential determinants of college choice (and therefore, college types of degrees with will define latter labor outcomes), in a context of increasing immigration and student and labor mobility and (d) compare cohorts pre- and post-H.B. 1403.

There are several types of selection that occur at the college level , selection due to a reduced group of students that have attained secondary schooling, selection due to a even more reduced group of students that think about going to college, and selection through the admissions process. All three of these process are defined by students previous educational experiences and their academic achievement levels, and sometimes, by their ethnic background, when race has been an admissions consideration. Although citizenship does not provide a good measure of immigration status nor type of immigrant, it does evidence that non-citizenship might be contributing to increasing disparities in postsecondary education outcomes and therefore latter wage gaps.

We find that relative to Whites, Blacks, Hispanics and Asians are less likely to be admitted to UT Austin and TX Tech and that after H.B. 1403 Blacks and Hispanics cohorts do evidence a slight increase in the probability of admission at UT Austin. This could be a post-Hopwood effect in light of which UT Austin pushed towards achieving previous levels of diversity[22]. On the other hand, residence increases the probability of admission but there is only a slightly decreased effect on the probability of admission observed at UT Austin for foreign-born populations. Cohorts post-H.B. 1403 evidence a decrease in the probability of admission in comparison to previous cohorts, and the previous negative effects for foreign-born populations and positive for residents appears reinforced at UT Austin. When analyzing cross-groups, we find that relative to resident citizens, foreign-born populations or nonresident natives evidence a

[22] White teen sues UT over admissions policy. Sugar Land student, in top of class, challenges racial preferences. April 8, 2008, 6:47AM. *Houston Chronicle.* http://www.chron.com/disp/story.mpl/front/5682324.html

lower probability of admission, but that cohorts post-H.B. 1403, show a slight improvement which is consistent with Kaushal's (2008) findings for young Mexican's.

Analyses of major choice show that African Americans, Hispanics and Asians are more likely to enroll in SE&Ms than Whites, and less likely to do so in other fields. Hispanics evidence much smaller effects than Blacks and Asians for SE&Ms. Post-H.B. 1403, the likelihood of students enrolling in SE&M versus other fields appears to increase at both institutions, yet Hispanics and Blacks cohorts at UT Austin evidence an increased probability of SE&M choice of major while in TX Tech such probabilities decreased. Two potential explanations for this and the previous trends have to do with how institutions have responded to the potential new pool of applicants, or students self-selecting into UT Austin. Controlling for selection bias on admissions appears to support the theory that previous estimates of race gaps in choices of major are underestimated. The same seems to be the true for non-citizens and non-residents.

Non-citizens are also more likely to enroll in SE&Ms at either institution by a rate of 11-12 percent and Texas residents are less likely to enroll in SE&Ms at a rate of 5 percent at TX Tech and 10 percent at UT Austin, the latter catering at a higher rate to non-resident students. There are no differences between pre and post-legislation cohorts of non-citizens and Texas residents and previous ones in the probability of SE&M enrollment at either institution. Cross-group estimations show that relative to citizens that are Texas residents, non-citizens residents, and citizens non-residents are appreciable more likely to enroll in SE&M majors and less likely to enroll in social science majors. Post-legislation cohorts appear to evidence an overall decrease in

the probability of enrollment in SE&M majors, yet relative to previous cohorts, none of these three groups appears to evidence increased probabilities in enrolling in SE&M.

The legislation, in the context of Texas' post-Hopwood environment has somewhat changed admission opportunities and how it has done so and for whom, very much depends on how we define the possible target population. Findings differ for Hispanics and Asians, foreign-born and resident populations, which potentially characterize different aspects of the undocumented, resident, population that has been granted access to in-state tuition. Moreover, access is not limited to "space", but as we have learned through time and analyses of gender and race, through the possibility of accessing mainstream professions with high wage returns.

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