

TEXAS' TOP TEN PERCENT LAW: THE IMPACT ON THE STATE'S NON-
FLAGSHIP, FOUR-YEAR INSTITUTIONS

by

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(Under the Direction of Erik C. Ness)

ABSTRACT

Until 1996, colleges and universities in Texas were able to use race in the admissions process to help craft diverse incoming freshman classes. The *Hopwood* ruling that year severely jeopardized the ability of minority students, particularly African American and Hispanic students, to attend the college of their choice. As a result of decreasing minority enrollment rates, the Texas legislature passed and the governor signed the Top Ten Percent law. This race-neutral admissions plan grants high school students who graduate in the top ten percent of their class automatic admission to any public, four-year institution in the state. The majority of educational research conducted on this topic is focused on the flagship institutions in Texas.

This study uses a difference-in-difference model with panel data to isolate the effect of the Top Ten Percent law in Texas on the racial diversity of non-flagship, four-year institutions in the state. Three race categories were used as dependent variables for the four models: (1) Percent first-time, first-year African American and Hispanic, (2) Percent first-time, first-year African American, and (3) Percent first-time, first-year

Hispanic. Quantitative findings were then used to show how the Top Ten Percent law impacted each race category for Texas institutions.

First, the findings indicate that when compared to the counterfactual institutions used in this study, and when controlling for population change and time, the Top Ten Percent law did increase minority enrollment rates at non-flagship, four-year institutions in Texas.

Second, minority students chose to enroll in less selective institutions. Third, minority students preferred colleges and universities located in urban and suburban areas. If challenges to race-based admissions continue in the future, a percent plan could be a good race-neutral option for institutions and states to adopt.

INDEX WORDS: Higher Education, Texas, Top Ten Percent Law, Panel Data, Difference-in-Difference, Affirmative Action, Racial Diversity, College Access and Choice, Universities

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DEDICATION

To Mom and Dad – y’alls love and support has meant everything over the years.

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CHAPTER 1

INTRODUCTION

Context

Since the Supreme Court case of *Brown vs. Board of Education* ended educational segregation in 1954, colleges and universities have struggled to increase access to public postsecondary institutions for minority students. Over the years many institutions adopted affirmative action policies to increase the diversity of the student body. Under affirmative action, applicants are awarded points or special consideration for their race or ethnic background if they come from an underrepresented group. These policies are often justified as attempting to reverse a history of racial discrimination.

Starting in the late 1970s, several Supreme Court cases have challenged the idea of affirmative action. One of the first cases to challenge affirmative action was *Regents of the University of California v. Bakke*. Alan Bakke, a White male, twice applied to the University of California at Davis medical school and was rejected. At the time, the UC Davis medical school reserved a certain number of spaces in the entering class for “qualified” minority candidates. Bakke contended that he was passed over for admission in both instances by less-qualified candidates strictly based on race. In the 1978 Supreme Court case, the Justices ruled that the use of rigid racial quotas violated the Fourteenth Amendment but that the use of race as one of many admission criteria was acceptable (*Bakke*, 1978). As a result, Bakke was admitted to the medical school.

In 1996, the Fifth Circuit Court of Appeals, comprised of Mississippi, Louisiana, and Texas, ruled on the case of *Hopwood v. Texas*. Cheryl Hopwood, a White female applicant to the The University of Texas School of Law claimed that she had been denied admission based only on race. Similar to *Bakke*, she claimed that other less qualified but more racially diverse candidates had been admitted ahead of her. The Court ruling banned the use of affirmative action in admissions practices at colleges and universities in the Fifth Circuit.

For Texas, the *Hopwood* ruling threatened the access and choice of minority college-aspiring students. The state Attorney General issued a very strict interpretation of the ruling. As a result, the two flagship institutions in Texas saw declines in their minority enrollment numbers, or racial composition, for the fall 1997 cohort. The Texas state legislature decided to act swiftly and passed H.B. 588 in 1997, also known as the Texas Top Ten Percent law. The bill grants students who graduate from the top 10% of their high school class automatic admission to any four-year, public, college or university and was fully in effect for the 1998 admissions cohort.

The Supreme Court heard two more affirmative action related cases in 2003, both stemming from the University of Michigan. In *Gratz v. Bollinger*, several White students claimed reverse discrimination because the admissions process included an automatic point bonus to all students from underrepresented ethnic groups. This bonus (20 points) was worth one-fifth of the total points (100 points) required for admission (Gratz, 2003). The Court ruled that an automatic point bonus for race was not constitutional and that race could only be used in the admissions process if each and every application was reviewed individually.

In *Grutter v. Bollinger*, the University of Michigan Law School argued that their use of race in the admissions process was narrowly tailored and did not constitute a quota system. The Court ruled that the use of race to obtain a racially diverse student body was a compelling interest and acceptable since all applicants were individually assessed and a quota system was not utilized (McCorkle & Pangilinan, 2010). This ruling overturned the *Hopwood* decision. As a result, the University of Texas at Austin began using race in the admissions process for the 2005-2006 incoming class (Horn & Marin, 2006).

During October 2012, the Supreme Court again heard more arguments regarding affirmative action when *Fisher v. University of Texas* appeared on the docket. Fisher, a white, female student outside of the top ten percent of her high school graduating class, applied for admission to the University of Texas but was denied due to a variety of reasons. She sued the University, arguing that because race was used in the admission process for remaining spots in the freshman class, that the Equal Protection Clause of the Fourteenth Amendment was violated. The Supreme Court ruled in 2013 that the Fifth Circuit court had erred and not applied “the strict scrutiny standard to the University’s admission policies” (*Fisher v. University of Texas*, n.d.b). The case was remanded back to the Fifth Circuit for review, who upheld the previous decision. Fisher sued again and in December 2015 the Supreme Court heard arguments to determine if the Equal Protection Clause of the Fourteenth Amendment was violated by UT Austin’s use of race in the admissions process (dubbed *Fisher II*). A ruling on this case was handed down in June 2016 and the Justices upheld in a 4-3 decision the right of UT Austin to use race as part of the admissions process (*Fisher v. UT Austin*, 2016).

In addition to the challenges to affirmative action, issues of affordability also threaten college access for minority students. According to the National Center for Public Policy and Higher Education (2002), the increases in tuition rates with the subsequent decreases in need-based aid to low-income students have hurt enrollment rates across the country. The shift towards merit-based aid mainly rewards White students that were already planning on attending college (Dynarski, 2004). While high-SES students are still able to apply to and attend their institutions of choice, low-SES students have to make more financially sound college decisions (Heller, 1997). If college enrollment and graduation rates continue to drop, there will be a shortage of educated workers to replace the baby boomers upon their retirement (Perna, 2006).

Definitions

The term “racial/ethnic diversity” is used in this study to refer to “the numerical representation of diverse groups” (Gurin, Dey, Hurtado, & Gurin, 2002, p.333) at the institutional level. The majority of the studies reviewed in this paper focus on African-American and Hispanic minority students, the racial and ethnic groups “that are experiencing the greatest achievement gaps as measured by traditional educational indicators such as attainment of bachelor’s degrees” (Bensimon, 2005, p. 99). Smith (2011) notes that while current projections suggest that higher education enrollment levels in the United States will become “minority-majority” by 2050, African-Americans and Latinos have historically been underrepresented minority groups within higher education (see also Allen, Teranishi, Dinwiddie, & Gonzalez, 2000; Bensimon, Hao, & Bustillos, 2006). While Teranishi and his colleagues (Teranishi, 2012; Teranishi, Ceja, Antonio, and Allen, 2004) make compelling arguments for including Asian Americans in

studies of higher education, they also note that Asian American populations are quite diverse, with over 34 ethnic groups. The data used for this study does not differentiate these different Asian American populations very finely. Also, statistically, the sample sizes for the Asian American and Native American populations are very small, and therefore these groups are excluded from this research.

The use of the term “flagship” should also be addressed. In this study, the term flagship is being used to refer to The University of Texas at Austin (UT Austin) and Texas A&M University (TAMU) in Texas. There are a couple of reasons for this determination. Colloquially, during the span of this study, the term flagship referred to one of those two institutions. Recent changes in the state have started to call this into question with both Rice University and the University of Houston gaining “very high research activity” designations from the Carnegie Foundation in the 2010 Classification (Carnegie Foundation, 2011). Also, many of the previous studies focused on the Top Ten Percent law use the word flagship as the designation for UT Austin and TAMU (Card & Krueger, 2005; Cortes, 2010; Furstenberg, 2010; Harris & Tienda, 2010; Long, Saenz, & Tienda, 2010; Long & Tienda, 2008; Niu & Tienda, 2010; Tienda, 2010; Tienda, Leicht, Sullivan, Maltese, & Lloyd, 2003; Tienda & Sullivan, 2010). Other studies use the terms “highly selective” or “selective” when discussing UT Austin and TAMU (Hicklin, 2007; Kain, O’Brien, Jargowsky, 2005; Long & Tienda, 2010). These parameters give the basis for the exclusion of flagship institutions from this study.

Problem

Since race-based admissions was banned in Texas, the state’s Top Ten Percent law has been understudied. Public, non-flagship, four-year institutions were also required

to implement the law, but very few papers discuss the implications at these types of institutions. This seems to be mainly due to the focus that the Texas state legislature places on the two flagship institutions. However, nearly 80% of the bachelor's degrees conferred in Texas at public colleges and universities are earned at non-flagship institutions (THECB, 2011). It is important to know if minority students have redistributed across the state and enrolled at non-flagship institutions.

Public, non-flagship institutions play an important role in Texas. They provide a wide variety of educational opportunities at a generally much more affordable price than flagship institutions. They are often situated in regions far from flagship universities, so students that have financial and/or familial restraints have the chance to attend a quality institution. They often focus on offering a valuable educational experience in an efficient manner, so students can graduate on-time with less debt. Students that choose to attend these types of institutions gain beneficial experiences that should not be overlooked in research.

Research Questions

One broad question guided this study: What impact did the Top Ten Percent law have on the public, non-flagship, four-year institutions in Texas? Reflecting on the purpose of this study, the literature suggests a couple of research questions:

1. What is the relationship between the Top Ten Percent law and racial/ethnic diversity at public, non-flagship, four-year institutions in Texas?
2. After controlling for the Top Ten Percent law and other factors, what is the relationship between the enrollment of African American and Hispanic

students at public, non-flagship, four-year institutions in Texas and the institutions' selectivity level and location (urban, suburban, rural)?

Sample and Data

Four other states were identified as comparable to Texas for the purposes of this study, spanning 1988-2009. The sample consisted of 78 institutions total: 25 from Texas, 10 from Colorado, 7 from Illinois, 28 from New York, and 8 from North Carolina. These states were chosen as the comparable states to Texas for several reasons. First, all the states have robust systems of higher education, each containing over 100 not-for-profit institutions. Second, all have state populations ranking in the top 25 nationally in size. Third, all the states have diverse populations above the national average, with growing Hispanic populations. The enrollment data was collected from the Integrated Postsecondary Education Data System (IPEDS) survey through the National Center for Educational Statistics (NCES).

Methodology

This study will use a panel data set, with a difference-in-difference model to answer the research questions. Panel data allows the researcher to look at both cross-sectional and time-series variables in the same study. The difference-in-difference model allows the researcher to highlight the intervention, in this case the Top Ten Percent law in Texas, and test it against states with no intervention.

Significance and Implications

Studying the impact of the Top Ten Percent law is especially important to me because I was a member of the first cohort admitted to college under the law. I am, therefore, interested in how this law has impacted the college-going population in Texas

since its inception. Since the ultimate goal of the law was to increase racial/ethnic diversity at colleges and universities in Texas, that is the main focus of this study. The law was designed to encourage high achieving students from historically underrepresented and/or academically low-performing high schools to apply for college. These types of high schools are typically attended by a high number of minority students.

The state of Texas has two recognized flagship institutions, the University of Texas at Austin and Texas A&M University. In addition, there are 35 other public four-year colleges and universities and over 50 community colleges and 2-year schools, not including the abundance of private and for-profit institutions in the state. The two flagship institutions have been the main focus of studies regarding the Top Ten Percent law. However, according to recent graduation data from the Texas Higher Education Coordinating Board (2011), nearly 80% of bachelor's degree striving students are enrolled at non-flagship institutions. There are many differences between flagship and non-flagship institutions, including size, scope, and prestige-levels. Students attending non-flagship institutions should be studied since they will be making a large contribution to the potential future workforce of Texas.

In addition to focusing primarily on flagship institutions, other studies of the Top Ten Percent law have not used very many years of data to examine the issue. A need exists to study the complete span of the original Top Ten Percent law. This study will cover that span from 1998 to 2009. Starting for the fall 2010 cohort, the University of Texas at Austin only had to admit 75% of their freshman cohort from the top ten percent applicant pool (Long et al., 2010; Harris & Tienda, 2010; Niu & Tienda, 2010).

With this shift in policy, it is important to understand all the implications of the Top Ten Percent law as well as affirmative action policies in general. Affirmative action policies have continued to be challenged within the court system as well as on state ballots. So far the Top Ten Percent law remains unchallenged in a court of law. For the future, state institutions that are subsequently banned from using race in the admissions process may want to look at how other states with affirmative action bans have handled maintaining diversity across the public college and university system. The Top Ten Percent law is one such example for examination.

Organization

The remainder of this dissertation is organized in the following way. Chapter two provides a review of the pertinent literature on affirmative action, college access and choice, organizational differences between flagship and non-flagship institutions, state higher education finance policies, and Texas' Top Ten Percent law. The research design and methodology are elaborated on in chapter three. Chapter four presents the findings for the research questions. Chapter five contains a discussion of the findings, including implications, conclusions, summary, and suggestions for future research.

CHAPTER 2

REVIEW OF LITERATURE

This chapter examines previous research on affirmative action, college access and choice, organizational characteristics of non-flagship organizations, and Texas' Top Ten Percent law. Based on the purpose of the study, understanding the impact of the Top Ten Percent law on public, non-flagship four-year institutions in Texas, this chapter provides details on the three main components of the study. First, what characteristics affect the college access and choice of underrepresented students? Second, how do non-flagship institutions differ organizationally from flagship institutions? Third, what is the Top Ten Percent law and what events lead to its creation? This chapter also considers related Top Ten Percent law studies, the approaches taken, and variables used.

Affirmative Action

In 1868, the Fourteenth Amendment was ratified, making African-Americans citizens of the United States as well as the states in which they resided, while also forbidding states from encroaching upon their rights as citizens (National Archives, n.d.a). Congress attempted to reiterate its intent to decrease discrimination by passing the Civil Rights Acts of 1866 and 1875 (Rai & Critzer, 2000). While these first steps toward racial equality were monumental, many states, especially in the South, continued to discriminate against people of color.

In 1896, the Supreme Court upheld state-imposed racial segregation in the *Plessy v. Ferguson* ruling. Separate facilities for blacks and whites were not considered a

violation of the Fourteenth Amendment so long as they were equal (McCorkle & Pangilinan, 2010). The ‘separate but equal’ doctrine was used as legal justification to continue racial discrimination and stratification. The facilities designated for African-Americans were generally subpar, especially the public educational facilities. In 1954, the Supreme Court ruled in *Brown v. Board of Education* (1954) that separate public schools for White and Black students were unconstitutional, guiding integration efforts across the country. A successful argument was made that “racial segregation in public education has a detrimental effect on minority children” (McCorkle & Pangilinan, 2010, p. 218). More importantly, the ruling considered all racial segregation as a violation of the Fourteenth Amendment, leading to the Civil Rights Movement.

The *Brown* ruling was especially unpopular in the South and it took many years before public education was fully integrated. President Lyndon B. Johnson realized that even with desegregation, minorities were still at a disadvantage within education and the workforce. During his commencement address to Howard University in June 1965, he laid the foundation for the affirmative action movement by declaring “You do not take a person who, for years, has been hobbled by chains and liberate him, bring him up to the starting line of a race and then say, ‘you are free to compete with all the others,’ and still justly believe that you have been completely fair” (Lyndon B. Johnson Library, 2007). Three months later President Johnson issued Executive Order 11246, aimed at correcting the effects of past and present discrimination, because “special, systematic actions were required to compensate for the accumulated disadvantage” (Allen, Teranishi, Dinwiddie, & Gonzalez, 2000, p. 5). The Order mandated that federal contractors take “affirmative action” to ensure that job applicants are not discriminated against based on race, creed,

color, or national origin (National Archives, n.d.b). This is one of the earliest uses of the term affirmative action.

Broadly defined, affirmative action “refers to measures or practices that seek to terminate discriminatory practices by permitting the consideration of race, ethnicity, sex, or national origin in the availability of opportunity for a class of qualified individuals that have been the victims of historical, actual, or recurring discrimination” (Aguirre & Martinez, 2003, p. 138). Colleges and universities began to use affirmative action policies in their admissions considerations during the 1960s. African-American students in particular were the beneficiaries of race-based admissions policies in higher education. Affirmative action policies began to be contested in the early 1970s and have frequently been decided in court (Weisskopf, 2004). In the 1990s, voters in both California and Washington approved anti-affirmative action legislation, prohibiting preferential treatment in education, public employment, and contracting (Rai & Critzer, 2000).

“Educators in U.S. higher education have long argued that affirmative action policies are justified” (Gurin, Dey, Hurtado, & Gurin, 2002, p. 330) because they provide excellent educational opportunities for all students. However, research into the effects of racial and ethnic diversity on a student body only began in earnest in the early 1990s, leading to a general lack of evidence to support the link. A study by Gurin et al. (2002), using both national- and institutional-level data, found that when students have consistent and meaningful experiences with diverse groups of students, both within and outside of the classroom, educational outcomes positively increase.

Currently, affirmative action policies appear in the form of preferential boosts, improving the competitiveness of certain applicants, instead of quotas. Since “higher

education is voluntary and seeks specific educational objectives,” the Supreme Court has been sympathetic to university policies regarding affirmative action (McNearney, 2012, p. 1374). The Supreme Court has repeatedly ruled that institutions of higher education have a compelling interest to pursue a diverse student body to enrich the educational experience, when diversity is defined broadly beyond race/ethnicity (Aguirre & Martinez, 2003; McCorkle & Pangilinan, 2010). However, the Court has also emphasized that affirmative action programs should be discontinued when no longer necessary (Johnson, 2004).

Nationally, only about 20% of all four-year institutions use race in admissions decisions, with the majority of these being the most academically selective institutions in the country (Bowen & Bok, 1998; Kane, 1998; Nettles, Perna, & Edelin, 1998). This finding implies that most non-flagship institutions do not use race in the admissions process. Critics of affirmative action argue that since few institutions use race-based admissions procedures, the policy may as well be abolished altogether. Research by Bowen and Bok (1998) suggests that imposing a strict race-neutral policy could push minority enrollment levels at the most selective institutions back to the pre-affirmative action levels of the 1960s. Minority students would be forced to settle for admission at less selective institutions. The next section will outline the challenges of college access and choice still facing minority students.

College Access and Choice

College access and choice have been high profile areas of investigation for many years. A college education is more accessible today than it was 50 years ago. However, higher education has continued to be stratified as “students of color and students from

lower socioeconomic backgrounds attend college at lower rates” (Bergerson, 2009, p. 1) than their counterparts. Historically underrepresented minority students are often less predisposed to attend college, have less access to and historical knowledge about college, and have less money to attend college (Bergerson, 2009). Inequalities still exist today in the higher education system in the U.S. These boundaries can seem impenetrable. As many universities strive for more diversity in the student body, leaders will need to implement new procedures to help serve these new students.

Characteristics of Students

There have been many studies that have examined the factors that lower not only the odds of attending a selective institution, but attending college at all. “Blacks, women, and lower-SES students were less likely to attend the more selective institutions” (Hearn, 1984, p. 25). Perna (2006) expanded upon this idea and discovered that individuals from low-SES families, those whose parents did not attend college, African Americans, and Hispanics were less likely to attend college. The educational possibilities for women have steadily improved, however. Since the 1960s, the proportion of women that have entered college has steadily increased. Mortenson (as cited in Baker & Velez, 1996) found that by 1976, the gender gap in college enrollment had closed.

The prospects for African American and Latino students remains mixed. In the early 1980s, Latinos were most likely to attend two-year colleges, while White and African American college students were more likely to enroll in four-year institutions (Baker & Velez, 1996). A shift has occurred, however. Perna (2006) found that Hispanic and African American students were now concentrated in two-year institutions. White and Asian students are most likely to attend selective institutions, possibly forcing

African American and Hispanic students into less selective colleges (Engberg & Wolniak, 2009). Some of the persistence of minority students choosing less selective institutional options may be due to “habitus or the internalized system of thoughts, beliefs, and perceptions acquired from the immediate environment” (Perna, 2000, p. 119) (i.e. where a student lives) which conditions one’s attitudes toward and aspirations to college.

Socioeconomic status continues to affect the likelihood of college attendance. As of 2006, the gap in college enrollment rates between low-income and high-income students was similar to the size of the gap in the 1960s (Perna, 2006). Baker and Velez (1996) found that “access to postsecondary education was strongly affected by SES” (p. 83). Social class effects were much more pronounced for students with weaker academic backgrounds (Baker & Velez, 1996). Students who had a large number of dependent siblings were less likely to attend highly selective institutions (Hearn, 1984). Ultimately though, the most talented students are able to overcome socioeconomic effects. For students attending four-year institutions, academic ability was able to trump socioeconomic factors (Baker & Velez, 1996).

Parental education level and engagement in their students’ life also plays a considerable role in whether college enrollment transpires. Students whose parents had lower educational attainment were less likely to attend highly selective institutions (Hearn, 1984). Students with parents that have some kind of college education were more likely to have discussions about college choice and higher education (Perna, 2006). When parents engaged actively in their students’ lives and at their school, students of color became more likely to attend college (Perna & Titus, 2005).

Communities and High Schools

The communities that children grow up in and the schools they attend shape college-going aspirations. Hossler and Gallagher (1987) discerned that socioeconomic status has a cumulative effect on students and it starts in preschool. They also note that students from high-SES backgrounds are four times more likely to attend college than low-SES students. Upper- and middle-class students are more likely to make the financial decision to attend college to abate the risk of falling into a lower social class (Breen & Goldthorpe, 1997).

The income level of residents in the area surrounding a high school affects the college attendance rates of its graduates. According to Bergerson (2009), students who attend low-resource high schools are less likely to attend college, often because they are less educationally prepared to do so. Her study also found that when students of color perceive that their high school coursework is not preparing them for college, their aspirations to a college degree decline. Students who are able to take more math, science, and other college preparatory courses increase their likelihood of attending college (Hossler & Gallagher, 1987). Bouse and Hossler (1991) also documented that students that maintain a high GPA are predisposed to attend college. High school graduates from academically higher quality schools are more likely to apply to many different types of colleges and universities (Engberg & Wolniak, 2009).

The aspirations of a high school students' peers can have a strong impact on college-going plans. Seeing your peers work hard to obtain a merit-based scholarship may increase your likelihood of working hard to obtain one for yourself (Dynarski, 2004). Peers, counselors, and teachers all transmit the necessary college-related

information and skills to students (Perna, 2006). Wells and Crane (as cited in Perna, 2000) argued that African American students who attend predominantly White high schools gain access to the “information and sponsorship networks that are required for educational attainment” (p. 120). Gaining the cultural knowledge that the dominant class values can increase access to college choice resources (Perna, 2006; Engberg & Wolniak, 2009). However, Engberg and Wolniak (2009) found that White students attend the least racially diverse high schools compared with other race groups, while Black students attend the most diverse high schools. They continue by commenting that first-generation students are particularly at-risk if they receive incorrect information about the college choice process.

Hossler and Gallagher (1987) found that proximity to a college or university is positively correlated with college attendance, and not even attendance at the nearest institution of higher education. They go on to report that minority and low-income students are more likely to attend a college or university that is geographically close to home. However, African American and Hispanic students often have lower educational aspirations than do White students (Kao & Tienda, 1998).

Feeder or legacy high schools. Some high schools have a history of sending many of their graduates to particular colleges and universities. Engberg and Wolniak (2009) have researched this idea, finding that when these ties exist, the high schools are considered feeder schools or legacies, because they send many applicants to fill available freshman cohort spots. Students who demonstrate less need for financial aid that attend high schools with these historical ties to a college or university are more likely to attend that postsecondary institution (Wolniak & Engberg, 2007; Engberg & Wolniak, 2009).

In a related study, Wolniak and Engberg (2007) found that academically higher quality high schools also have more established feeder legacies. More importantly, they found that White students often attend high schools with more established feeder legacies than do African American and Hispanic students.

Colleges and Universities

The transition from high school to college can be difficult, especially for students that lack knowledge about postsecondary education. Perna (as cited in Perna, Rowan-Kenyon, Bell, Thomas, & Li, 2008) suggests that “the most important student-level predictors of college enrollment are academic preparation and achievement, financial resources, knowledge and information about college, and family support” (p. 246).

Students that are able to navigate the college application process and actually enroll take an important first step toward educational attainment. As Perna et al. (2008) noted, from 1990-2000, the number of enrolled African American and Hispanic undergraduates at colleges and universities has increased nationwide. Additionally, the degree completion rate for these two groups has also increased. Perna, Steele, Woda, and Hibbert (2005) verified that the college enrollment rates for all groups increased during the 1990s. This is probably due to the growth of the high school graduating, college-eligible population in the United States (Perna et al., 2005). However, Hispanics and African Americans still remain underrepresented overall in higher education (Perna, 2000).

Tuition policies. Tuition and fees can present a significant hurdle towards college enrollment for lower-SES high school graduates. According to Leslie and Brinkman’s (1987) classic study of student price response, tuition is often the most visible college cost and potential students are conscious of the widely publicized annual

increases. More recently, Perna (2006) and Titus (2009) found that since the mid-1990s, family income has not been able to keep up with the growth of tuition, because tuition rates have been increasing faster than the inflation rate. In particular, Heller's (1997) update to Leslie and Brinkman's study finds that African American students were more sensitive to changes in tuition and fees than White students. Students from lower income families are also more sensitive to college price changes (Heller, 1997; Engberg & Wolniak, 2009). Increasing tuition rates may have contributed to the continued stratification of higher education along racial/ethnic boundaries. College continues to become less affordable, especially for low-income students (Heller, 1997).

Leslie and Brinkman (1987) estimated that "a \$100 tuition price increase [was] associated with...an enrollment decline of 1.8 percent, *ceteris paribus*" (p. 189). Tuition rates have only risen since the 1970s, possibly leading to fewer college graduates when compared to the overall college-age population. According to *Measuring Up 2006* (as cited in Titus, 2009), over the past 20 years, the ratio of bachelor's degrees awarded to undergraduates enrolled has remained stable. This is problematic because if fewer students are earning degrees, as the baby boomers begin to retire there will be a shortage of college-educated workers in the labor force (Perna, 2006).

Financial aid. Title IV of the Higher Education Act authorized financial aid programs so that inadequate financial resources would not be a factor in college access decisions. However, college enrollment patterns are still stratified along racial and socioeconomic lines (Perna & Titus, 2004). Having an offer of financial aid was an important predictor for the college enrollment of high school graduates, regardless of the type of aid (Perna, 2000; Engberg & Wolniak, 2009). "African Americans and Hispanics

were more likely than Whites to receive grants...” (Perna, 2000, p. 128). Heller (1997) found that enrollment levels were sensitive to grant awards. When analyzing the decline of college applications from African American and Latino students, the most important factor was the decrease in the amount and form of financial aid (Baker & Velez, 1996). The increasing reliance on loans to pay for college works against Hispanic and African American students, since they were often less knowledgeable about loans and hesitant to take on educational debt (St. John, 1994).

College choice process. Hossler and Gallagher (1987) posited a three-stage college choice process comprising predisposition, search, and choice. The predisposition stage was the point where students decide whether or not to continue receiving education past high school. Occupational and educational aspirations emerge at this point (Cabrera & LaNasa, 2000). During predisposition, parents and peers shape the attitudes surrounding the idea of higher education. Students with friends that were planning to continue their education were more likely to be planning to go to college as well (Hossler & Gallagher, 1987). However, Hurtado, Inkelas, Briggs, and Rhee (1997) suggest that the predisposition phase be revised to better understand students’ preparation differences across ethnic groups.

In Hossler and Gallagher’s (1987) search phase, students begin to gather information about potential colleges of interest. At this point colleges and universities try to exert as much influence as possible over the decision-making process. Low-income students, African Americans, and students whose parents were less educated “conduct searches which take longer and are less efficient” (Hossler & Gallagher, 1987, p. 214). Affluent students tend to be more knowledgeable about college costs, conduct broad

searches, and have parents who have saved money for college (Cabrera & LaNasa, 2000). Since Hossler and Gallagher's study regarding college choice was published in 1987, the ability to gather information about colleges and universities has changed drastically due to the proliferation of the internet. It is now much easier to research institutions and therefore an update to their model could be in order.

During the choice stage, the final stage of Hossler and Gallagher's (1987) model, students evaluate their top picks and decide which institutions to apply to and eventually which college to attend. Underrepresented students enter the college choice process later, obtain information differently, and often do not have parental guidance throughout the process (Bergerson, 2009). Low-income students were also more "sensitive to tuition and financial aid levels" (Cabrera & LaNasa, 2000, p. 12).

Perna (2000) shows that African Americans, Hispanics, and Whites vary in their college decision-making processes. Hurtado et al. (1997) found that "Latino students are least likely to engage in an extensive search and choice process" (p. 64). Hispanics and Whites have comparable four-year college enrollment rates when controlling for social and cultural capital, costs, benefits, and ability (Perna, 2000). After controlling for pertinent variables, "college-choice outcomes are lower for African Americans than for Whites" (Perna, 2006, p. 136). Low-SES high school graduates are more likely not to enroll in any type of college than they are to have some type of college experience (Perna & Titus, 2004). Students who enroll in a four-year college immediately following high school graduation are more likely to graduate with a bachelor's degree and therefore realize higher earnings and occupational status (Perna & Titus, 2004).

Selectivity level. Melguizo (2008) found that selective institutions have higher graduation rates than less selective institutions. She points out that African American and Hispanic students, especially, benefit by attending elite institutions, including graduating at higher rates than their counterparts at less selective institutions. Minority students also gain personal benefits such as higher future income earnings and aspirations of attending graduate school (Melguizo, 2008). The bottom line is that the quality of an institution matters and African Americans and Hispanics especially benefit from higher quality institutions.

Furthermore, Melguizo (2008) suggests that when minority students fail to graduate from college there are individual, institutional, and societal repercussions. Individually, a student will not reap the economic benefits of a bachelor's degree. Institutionally, decreases in graduation rates can affect national rankings as well as state appropriation amounts. Society is damaged by not gaining a more educated workforce and the associated increase in tax revenues (Melguizo, 2008).

Furstenberg (2010) contradicts these findings. He studied students that would not have attended selective institutions in Texas without the help of the Top Ten Percent law. He found that top decile students were more likely to attend selective institutions. However, his results suggest that underprepared students that graduated in the top decile of their high school graduating class were not able to perform academically and subsequently performed worse academically year after year.

Organizational Differences

The higher education system in the United States contains a wide variety of institutional types: 2- and 4- year, public and private, not-for-profit and for-profit, large

and small, urban and rural, research focused and teaching focused. Most states contain at least one flagship institution which often receives more attention and funding from the state legislature than the other institutions. Non-flagship institutions can differ from flagship institutions based on typology, climate and culture, and structure. These three points are discussed below.

Institutional Culture

The culture of a college or university can shape how outsiders view the institution. Institutional culture can be referred to as something an organization has or as the way an organization is (Peterson, Cameron, Jones, Mets, & Ettington, 1986). Members of the institution have a perception about how the organization runs and a solid sense of the way to do things. When the culture of an institution is rich, employees are more likely to be productive.

Culture at the variety of public college campuses across the country can also be described by the archetypes posited by Birnbaum (1988). While these typologies are in no way exact or all-encompassing, they provide a starting point for understanding the different types of institutions available in a state. Flagship institutions could most closely be categorized as anarchical in Birnbaum's system. Both anarchical and flagship institutions are large in size: from the student body, to the professional staff, to the number of faculty members, to the physical land holdings. Most flagship institutions are denoted by the Carnegie Foundation as having very high research activity. Birnbaum (1988) suggests that flagship faculty members are the most professionalized, with most holding Ph.D.'s. However, he goes on to note that they are often more concerned about departmental issues than university-wide ones and are less active in faculty senates.

The following two archetypes define other public, non-flagship, four-year institutions: political and collegial. Regional, comprehensive universities are considered political institutions by Birnbaum (1988). These types of institutions may be fairly large, but are still striving for more research activity and the status/prestige of flagship status. Birnbaum (1988) states that the main goal of individuals in this type of institution is to acquire and use power to make decisions. Coalitions of like-minded individuals join together to negotiate for their desired outcomes (Birnbaum, 1988).

Finally, a small liberal arts college with several thousand students can be classified by Birnbaum's (1988) collegial archetype. He describes collegial institutions as close-knit communities on-campus and around town. He found that presidents of these types of institutions are seen as "first among equals" and (s)he and the administration exist to do the bidding of the faculty. Birnbaum continues by noting that faculty members generally hold Ph.D.'s but have little pressure to conduct research and publish because their focus is on classroom teaching and student advisement. Decisions are made through careful deliberation and discussion and can take a long time (Birnbaum, 1988). Institutional cultures are often very rich at non-flagship, collegial-type institutions.

Faculty morale can affect and be affected by culture. Baldrige, Curtis, Ecker, and Riley (1976) discuss several other factors that influence faculty morale including environmental factors, professional tasks, and the size/complexity of the organization. Their research found that as the professionalization of the staff and quality of the students increases, faculty morale increases. They also discovered that faculty members that were able to have a hand in the decision making processes of the institution while also being insulated from external pressures have higher morale. Birnbaum (1988) noted that

faculty and staff members at collegial institutions were very involved in all aspects of campus-wide decisions. He also suggests that faculty and staff members at political institutions may feel left out of the decision-making process because most decisions are made without their input.

Larger institutions are usually more complex, but their sheer size can also act as a buffer from external pressures and help keep bad practices contained (Birnbaum, 1988). Faculty members at larger, more complex institutions generally feel protected and therefore have higher morale (Baldrige et al., 1976). For the most part, these descriptions are accurate of faculty at flagship institutions. However, faculty at both flagship and non-flagship institutions often have low institutional identity and are willing to leave their current campus for better opportunities: flagship faculty to Ivy League institutions and non-flagship faculty to flagship institutions (Baldrige et al., 1976).

Changing the culture of an organization can be difficult, especially at flagship institutions. Faculty, staff, and administrators may be comfortable with the way processes occur and not be willing to change. Change can be easier at smaller, non-flagship institutions, especially if they are trying to move up in the marketplace. Peterson et al. (1986) indicated several ways to instigate change. First, a strong president can institute change. This is sometimes necessary to distinguish the current leadership from past experiences at the institution. Second, adding a new unit or academic program can be a chance to shape the culture of that particular area. Third, going through reorganization or restructuring can be a chance to change ineffective or inefficient standard operating procedures and start from scratch with a new culture of efficiency.

Also, the occurrence of a cataclysmic event can be a chance to change culture to prevent future disasters (Peterson et al., 1986).

Identity and image. Identity and image can also shape how faculty members feel about their institution. Bess and Dee (2008) describe identity as how members feel about the defining characteristics of their workplace. Relating strongly with the institutional identity can make an individual more likely to want to make the organization a great place and lead to efficiency and effectiveness in completing tasks (Bess & Dee, 2008). Identity is usually stronger at smaller institutions, such as non-flagship institutions.

Image is defined as how those outside of the institution view it (Bess & Dee, 2008). Bess and Dee (2008) observed administrators spending large amounts of money on marketing and publicity in order to shape an institution's image. Image can also be passed down in families through stories about 'the good old days' at a university. A potential student will have a better college experience if their perceived image of the institution matches the actual identity (Bess & Dee, 2008). The image of flagship institutions is often better publicized in the media than that of non-flagship institutions.

Non-flagship institutions often have an image as a low-cost, closer-to-home opportunity for a quality higher education experience. For students with severe financial barriers or family obligations, if the nearest flagship institution is located hundreds of miles away, a valuable educational experience much closer to home can be appealing. By carving out a niche as an affordable option offering fruitful experiences, lower debt, and on-time graduation, non-flagship institutions can differentiate their image from those of flagship institutions.

Structural Characteristics

An institution of higher education faces many internal and external forces, according to Van Vught (1997). Internally, he notes the president, deans, chairs, and faculty may all have different thoughts about how the institution should be run. Externally, he finds that members of the institution may feel pressure from potential students, donors, alumni, contractors, state systems, legislators, and governing bodies. All these forces must be balanced in order for an institution to run smoothly.

Organizations often reside in a resource-providing niche. When resources begin to evaporate, organizations must adapt and compete against others in their niche in order to survive (Bess & Dee, 2008). Sometimes adaptation can mean completely changing the focus of an institution, such as becoming co-ed after a historical mission of single-sex education. These types of adaptations can be difficult for faculty, staff, and alumni to understand. However, organizations that can evaluate the environment and adapt quickly without waiting for a new planning cycle are more likely to survive (Bess & Dee, 2008). Having organization members that are constantly scanning the environment for processes or ideas to borrow is a key to survival (Bess & Dee, 2008). Non-flagship institutions are more likely to have the capability to do these things because of their smaller size/structure. Also, non-flagship institutions are usually distinctive and not comprehensive. Non-flagships that try to expand too quickly to become more comprehensive may fail in that new mission.

All institutions rely on external resources to survive. The level of dependence differentiates non-flagships from others. Rizzo (2007) found that non-flagship institutions may be funded more readily by state legislatures because they have lower

tuition and fees, provide widespread benefits, and are perceived as more efficient than flagships. Flagship institutions have started to see greater decreases in state appropriations and as a result have started to raise tuition rates and fees in order to make up the difference.

A recent study by Weerts and Ronca (2012) found that part of this decrease in funding may be due to the greater ability of flagship institutions to secure external funding through grants and gifts. They discovered that appropriations for higher education became less stable as you move towards “major research university” status as classified by Carnegie. They also noticed that when the economy goes through a downturn, legislatures begin to view flagship institutions as less of a priority, and therefore needing less state support. This research suggests that while state legislators may want to tout the accomplishments of their flagship institutions, when budgets begin to tighten they are more likely to fund the less expensive educational options within the state.

Institutions also try to differentiate themselves from similar institutions. Colleges and universities like to highlight their unique programs and interesting characteristics. However, they must also stay within certain historical norms and values about the field (Bess & Dee, 2008). Straying too far away from the standard model can lead to decreases in public support. Both flagship and non-flagship institutions engage in this activity, but flagships institutions often have a larger budget to publicize their differentiation.

Flagship institutions have the most departments, units, research centers and faculty (Dill, 1997). As a result, there is much diversity in the types of academic

programs offered. Students in the more technical and scientific fields are often asked to pay more for access to laboratories and nicer facilities. Programs that are very popular may also increase their fees to gain additional revenues, such as business programs. Flagships may also be under more external pressure from a Board of Regents or state legislature and therefore need to fight for every dollar it can (Dill, 1997). Non-flagship institutions are less likely to engage in these types of funding practices, often keeping tuition and fees low in an attempt to increase accessibility. Some less selective institutions have a set price per credit hour, regardless of the type of class. Non-flagships may be somewhat more protected from external influences in the form of more stable public financial support (Dill, 1997).

State-Level Higher Education Financial Policies

This section will review the literature on state-level financial aid policies across the country. A brief overview of state appropriations to higher education and tuition policies begins the section. Then state-level need- and merit-based aid programs will be examined more closely. A discussion of state-level aid programs is important because they alter enrollment patterns within a state. Merit-aid programs are especially targeted at keeping high achieving high school students in-state, similar to one of the latent goals of the Top Ten Percent law in Texas.

Appropriations and Tuition

During the 1990s and into the 21st century, higher education spending has served as the “balance wheel” for state budgets, increasing when revenues rose and decreasing when the economy fell (Hovey, 1999). “For every 10% increase in per capita appropriations to higher education institutions, bachelor’s degree production rise by three

percent” (Titus, 2009, p. 456). States that help support higher education through direct appropriations to institutions see an increase in the number of bachelor’s degrees awarded (Titus, 2009). Perna and Titus (2004) found that “increasing direct appropriations to higher education institutions...may help reduce “brain drain”” (p. 521).

As state appropriations have decreased across the country, colleges and universities have been forced to raise tuition rates to make up for the monetary shortfall. Kane (1995) noted that tuition increases at public four-year institutions were associated with increases in enrollment at public two-year institutions and a decrease in enrollment at four-year colleges. In another study, Kane (as cited in Perna & Titus, 2004) found that each \$1000 increase in tuition at two-year institutions was associated with a 4.5% drop in enrollment in the state. “As states move away from their historical commitment to low public tuition levels...those least able to afford to attend college are likely to be disproportionately impacted” (Heller, 1997, p. 651). Interestingly, Titus (2009) found that increases in tuition at four-year institutions did not affect the production of bachelor’s degrees.

Many families opt to pay into state-sponsored college saving plans when their children are very young. These plans generally lock tuition at a certain level, which could be helpful for families during times when the economy slows and appropriations to colleges shrink. However, state-sponsored college savings plans disproportionately favor middle- and upper-income families. Historically, low-income families have less disposable income, and therefore tend to have less money available for a savings plan (Perna et al., 2005). African Americans and Hispanics are often members of this

underrepresented group and do not reap the benefits, therefore shouldering a larger financial burden.

Need-based Aid

Historically, government aid to students, whether federal or state, has been need-based. As noted by Dynarski (2004), at the state level, need-based aid was usually in the form of low tuition at public institutions available to all state residents. Federally, aid has been targeted to low-income students to help them offset price increases (Leslie & Brinkman, 1987). State and institutional need-based aid programs promote student choice to different types of institutions (Perna & Titus, 2004). Also, states that support need-based aid enjoy an increase in enrollment levels at in-state four-year institutions (Perna & Titus, 2004). Need-based aid positively influences bachelor's degree production within a state (Titus, 2009). However, Heller (2002) found that need-based aid programs are decreasing in popularity as merit-based aid programs continue to proliferate. States that move away from need-based aid increase the stratification of higher education in the U.S. (Bergerson, 2009).

Merit-based Aid

A shift in the type of state-level aid being awarded began in the 1990s as merit-based aid programs began to proliferate, especially in the Southeast. Merit-based programs reward academically solid, though not exceptional, students with funding to attend in-state colleges and universities (Dynarski, 2004). As of 2010, 14 states had adopted some type of statewide merit-aid program (Zhang & Ness, 2010). Parents and students may feel a personal connection to the scholarship since it has been “earned” by the student, not awarded through a mysterious committee process. Families may

therefore fight harder for the continuation of merit-based programs (Dynarski, 2004). Consequently, these programs enjoy much political success because students from middle- and upper-class backgrounds are the primary recipients (Cornwell, Mustard, & Sridhar, 2006). Essentially this means that merit-aid programs reward White students that already had plans of attending college without the scholarship. Unfortunately, students of color are more sensitive to college price changes and would therefore benefit the most from a scholarship (Dynarski, 2004).

Programs such as the Georgia HOPE Program essentially “change the relative prices of enrolling in different types of institutions” (Cornwell et al., 2006, p. 767). They continue by stating that in Georgia, enrollment in four-year institutions rose by almost 9% because of HOPE. Much of this increase can be explained by students staying in-state to attend college (Cornwell et al., 2006; Dynarski, 2004; Zhang & Ness, 2010). Cornwell and Mustard (as cited in Cornwell et al., 2006) show that Georgia’s HOPE program also helped increase the average SAT scores of incoming freshmen and the number of students from the top 10% of their high school graduating class attending in-state. Additionally, some preliminary research suggests that students continue to stay in-state after graduation, leading to increased tax revenues for the state government (Zhang & Ness, 2010).

The Georgia HOPE program has been shown to encourage students to attend four-year rather than two-year institutions, changing where students attend college, not whether they do so (Cornwell et al., 2006; Dynarski, 2004). Two-year institutions may see a drop in enrollment as the “discounted” cost of tuition shifts students towards four-year institutions (Dynarski, 2004). Cornwell and Mustard (2006) also showed that the

Georgia HOPE program increased the number of students from the top 10% attending the most selective institutions in the state. This finding suggests that the effects of merit-aid programs spill upward from two-year institutions towards four-year institutions, with the most selective institutions being the greatest beneficiaries. Overall, in merit-aid states, enrollment increases are more pronounced in research and doctoral institutions, however some variation between states exists (Zhang & Ness, 2010).

More research needs to be conducted to see if merit-aid programs increase the GPAs of enrolled students. However, Dynarski (2004) noted that African American and Hispanic students depending on merit-based aid may be at a disadvantage since they “receive relatively low grades in college, which threatens their ability to keep any merit scholarship” (p. 68) after the first year due to the stringent GPA requirements for renewal. Many of the systemic inequality barriers mentioned previously contribute to this disadvantage.

Texas’ Top Ten Percent Law

The previous section explored how educational policies in other states have impacted college enrollment patterns. The focus now shifts to the Top Ten Percent law in Texas. A brief overview of the political landscape that led to the implementation of the law follows below.

Hopwood vs. Texas

The March 1996 *Hopwood v. Texas* case, heard by the Fifth Circuit Court of Appeals, threatened access to higher education for African American and Hispanic students. The case stemmed from four White applicants to The University of Texas School of Law who claimed that race-based admissions discriminated against their right

to have an equal opportunity to attend law school. They believed that they had been passed over for admission by other, less qualified but more racially diverse applicants (Long & Tienda, 2008). While the Court did outline some educational benefits of a diverse student body, ultimately it found that race-conscious measures were “not a compelling state interest because [they] reinforced racial stereotypes” (McNearney, 2012, p. 1375). The Court ruling banned affirmative action in admissions policies at all public universities in the circuit, which includes Louisiana, Mississippi, and Texas. The Court ruling therefore banned the use of race as a factor to form a diverse student body, beginning in 1997.

Prior to 1996, The University of Texas at Austin (UT Austin) and Texas A&M University (TAMU) were the only two public universities in Texas that reported using race as part of the admissions process to help shape a diverse incoming freshman class (Tienda, Leicht, Sullivan, Maltese, & Lloyd, 2003). Long and Tienda (2008) found that at UT Austin, African American and Hispanic applicants had a 14% higher likelihood of admission than comparable White applicants. At TAMU, they found the advantage for minority applicants to be 13% when compared to similar Whites.

Not all public institutions in the Fifth Circuit Court of Appeals responded in the same manner to the ruling, however. According to Chapa and Lazaro (1998), colleges and universities in Louisiana and Mississippi did very little to change their admissions practices. Conversely, several universities outside the jurisdiction of the Fifth Circuit made the decision to follow the ruling and discontinue race-based admissions (Horn & Marin, 2006).

In Texas, Attorney General Dan Morales issued a very strict interpretation of the ruling. Not only did colleges and universities have to change their admissions policies and paperwork, financial aid officers could no longer offer scholarships targeted to racially underrepresented applicants (Chapa & Lazaro, 1998). College access for many African American and Hispanic students in Texas was jeopardized. No other state in the country implemented such strict regulations (Chapa & Lazaro, 1998). This opinion was later retracted by Morales' successor, but with the caveat that while financial aid could once again be targeted to African Americans and Hispanics, admission decisions should remain race-neutral until all appeals in the *Hopwood* case were settled (Tienda et al., 2003).

Creation of the Top Ten Percent Law

As a result of the *Hopwood* decision, Barr (as cited in Harris & Tienda, 2010) found the “flagship campuses registered sharp declines in the number of Black and Hispanic first-time freshman” (p. 60) in the fall 1997 cohort. Many potential students from underrepresented groups chose not to apply to the flagship institutions because admission either seemed “out of reach” or they received better financial aid offers from institutions in other states (Chapa & Lazaro, 1998). Consequently, UT Austin enrolled 980 fewer African Americans and Hispanics and TAMU enrolled 1179 fewer African Americans and Hispanics during the fall of 1997 (Tienda et al., 2003). State lawmakers became concerned that the college enrollment levels of the states’ African American and Hispanic high school graduates would continue to plummet. During the 75th legislature, members “passed H.B. 588, the uniform admissions law, which guarantees admissions to any Texas public university to high school seniors who graduate in the top decile of their

class” (Harris & Tienda, 2010, p. 60). It should be noted that no financial aid money was tied to this bill and that it only applies to graduates from Texas high schools.

H.B. 588 was building on research that “high school grades are a better predictor of college success than standardized test scores” (Niu & Tienda, 2010, p. 45). Since admissions decisions for the fall 1997 cohort had already been made when the bill passed, it went fully into effect for the fall 1998 incoming college freshman class. Ultimately, this law was intended to increase the racial/ethnic diversity of the student populations at the two flagship institutions, but applied to all public colleges and universities. Interestingly enough, prior to *Hopwood*, both UT Austin and TAMU already admitted the majority of applicants that were in the top ten percent of their high school graduating class (Long & Tienda, 2010; Tienda et al., 2003).

H.B. 588, or the Top Ten Percent law as it is commonly called, was viewed as a “race-neutral alternative to affirmative action” (Harris & Tienda, 2010, p. 61). The bill sought to increase diversity at public institutions of higher education by broadening the scope of high schools that sent applicants to the flagship universities (i.e. UT Austin and TAMU) (Harris & Tienda, 2010). Ideally, students from high schools that never sent any applications to the flagship institutions would have greater incentive to do so if they were guaranteed admission. The law “benefited high achieving minority students who may have been rejected for low test scores or poor essays” prior to its implementation (Tienda et al., 2003, p. i).

Three features make H.B. 588 unique: 1.) it disregards standardized test scores; 2.) it does not impose any guidelines for how high schools should rank students; and 3.) students are allowed to apply for any public institution they desire to attend in the state

(Tienda, 2010). Tienda and Sullivan (2010) note that rankings for students can vary because individual high schools or districts are able to determine how to weight honors classes. Also, there is no set point at which high school GPAs must be reported: it can be any time from the end of the 11th grade through graduation (Tienda & Sullivan, 2010). Therefore, students are competing against their high school classmates in an attempt to gain automatic admission (Niu & Tienda, 2010).

Originally, students did not have to complete a specific curriculum to be eligible for the Top Ten Percent law. According to Tienda and Sullivan (2010), some opponents of the law claimed that students opted to take easier classes, therefore making themselves less prepared for college, in order to remain in the top ten percent of their graduating class. In 2001, the Texas legislature passed an amendment to the law requiring students to complete the recommended or advanced curriculum in order to be eligible for automatic admission (Tienda & Sullivan, 2010). Overall, since the implementation of the Top Ten Percent law, high school absentee rates have dropped and test-taking rates have risen (Tienda, 2010).

Previous Findings from Top Ten Percent Law Studies

Several studies have been conducted to determine the effectiveness of the Top Ten Percent law in Texas. Most of these papers have focused on the impact of the law at the two flagship institutions in the state. This section categorizes the results of these previous studies.

High school attended. Research shows that the high school attended is a major factor in determining college success (Boyle, 1966; Niu & Tienda, 2010; Tienda, 2010). Top-ranked students from affluent high schools are more likely than their counterparts at

poor high schools to not only seek admission to a public flagship but also attend and persist (Harris & Tienda, 2010; Tienda, 2010). Tienda and Sullivan (2010) note that African American and Hispanic students benefit the most if they attend a segregated school. As minority students move into integrated districts, their likelihood of graduating in the top ten percent of their class diminishes. White students that attend minority-majority high schools are more likely to qualify for automatic admission to college (Tienda & Sullivan, 2010).

Student behaviors may also change as a result of the law. There has been research to suggest that some students will attempt to transfer from a more to a less competitive high school in order to improve their chances of graduating in the top 10% (Cullen, Long, Reback, 2013). These strategic moves often displace the intended beneficiaries of the law (Allen, 2014). Other students will try to be strategic in their high school course selections, attempting to complete courses that will give them higher GPAs, either through difficulty level or ease of earning the desired grade (Daugherty, Martorell, and McFarlin, 2012).

Financial issues. Since financial issues are a substantial reason why students from low resource high schools often opt not to attend flagship institutions, UT Austin implemented the Longhorn Scholars program while TAMU created the Century Scholars program (Tienda et al., 2003). Both scholarship programs target high schools that have historically sent few or no applications to their institutions. Recent research by Fletcher and Mayer (2014) suggests that these financial aid packages may entice students toward flagship institutions and away from private institutions in the state.

As a result of these programs, high school sending patterns at the over 1500 high schools statewide have been altered. “The number of high schools that sent one or more applicants to UT [Austin] rose from 678 to 798; at TAMU the comparable increase was from 819 to 925 schools” (Long et al., 2010, p., 84). That being said, the socioeconomic features of applicants is resistant to change, and the poorest high schools still do not send a representative sample of applicants to the flagship institutions (Tienda, 2010). While knowledge of the law can raise “the sights of students who might not otherwise attend college” (Lloyd, Leicht, & Sullivan, 2008, p. 1128) that does not necessarily translate to increased application rates for minority students

Diversity. Horn & Marin (2006) suggest that a “diverse student body does improve learning outcomes” (p. 170). While the Top Ten Percent law seems to have widened the geographic representation of students at the two flagship institutions, many studies suggest that racial/ethnic diversity has not regained its pre-*Hopwood* levels. Long and Tienda (2008) and Harris and Tienda (2010) found that White applicants have maintained an advantage over African American and Hispanic applicants since *Hopwood*, even with the introduction of the Top Ten Percent law. “African American and Hispanic application rates actually worsened” under the Top Ten Percent law “compared with the pre-*Hopwood* regime” (Tienda, 2010, p. 10). Tienda et al. (2003) found that *Hopwood* reversed the favorable admissions conditions of minority students from the second decile or below. Minority groups “would probably have retained their share of admissions under affirmative action” (Harris & Tienda, 2010, p. 78). The rate of Hispanic and African American students attending the most selective institutions has not kept up with the population growth in the state (Kain, O’Brien, & Jargowsky, 2005). Whether these

students would have opted to study at non-flagship institutions instead remains to be seen.

Graduation and retention rates. After the Top Ten Percent law was enacted, Cortes (2010) found that both retention and completion rates of lower-decile underrepresented students decreased. She also noted that these students did not seem to fare as well in college persistence and completion when compared to top decile students. Even second-decile African American and Hispanic students saw a decrease in freshmen retention and six-year graduation rates (Cortes, 2010). Furstenberg (2010) corroborates these results by reporting that the Top Ten Percent law had negative effects on the first- and sixth-semester GPAs of students admitted under the law, as well as on the graduation probability of these students.

Spillover effects. Some research suggests that the non-flagship, four-year institutions benefitted from the Top Ten Percent law. While race-based admissions was directed at the more selective flagship universities, minorities were redistributed to other institutions throughout the state (Hicklin, 2007). Tienda et al. (2003) note that since the flagship institutions regularly admitted students in the top 10% prior to *Hopwood*, students in the second and third deciles were most affected by the end of affirmative action. They also propose that highly qualified minority students not within the top ten percent may have perceived that the law precluded their admission to the flagships and therefore applied elsewhere.

As the carrying capacity of the flagship institutions was quickly filled, students from the second and third deciles had to redistribute to other public institutions (Hicklin, 2007). Applicants who could not gain automatic admission to the flagship universities

expanded their application set of institutions. Long and Tienda (2010) found an increase in the number of highly ranked applicants (i.e. second and third deciles) to non-flagship colleges and universities who did not qualify for automatic admission at the flagship institutions. Hicklin (2007) concluded that less selective institutions saw increases in minority enrollments. Horn (2001) determined that the law increased the proportion of Whites attending less selective institutions in Texas. Andrews, Ranchhod, and Sathy (2010) suggested, however, that many non-top decile students applied to out-of-state colleges. These findings suggest that highly ranked minority students were being admitted to the flagship institutions and therefore pushing lower decile minority and White students to less selective in-state institutions or out-of-state completely.

Other findings. Legislators did not foresee how the law would hamstring universities in their ability to shape a diverse freshman class (Tienda & Sullivan, 2010). While students from economically disadvantaged high schools were given more opportunity to attend college, many highly qualified students from the second and third deciles were excluded from admission (Niu & Tienda, 2010). These excluded students either had to attend non-flagship institutions or matriculate at high-quality colleges out-of-state, paying more in tuition costs.

The law also “greatly diminished public universities’ discretion to consider many elements of their mission” (Tienda & Sullivan, 2010, p. 170). Texas colleges and universities “do not reserve a fixed number of slots for non-Texas residents” (Harris & Tienda, 2010, p. 79). Therefore, most freshman cohort slots are filled with Texas residents, diminishing the diversity effects gained from non-Texas and international students. UT Austin and TAMU also abandoned their initial plans to limit undergraduate

enrollment, especially at the freshman level (Kain et al., 2005). However, UT Austin has filled so many of their freshman class spots with students from the top ten percent that during the 81st Legislature they were granted the ability to impose a 75 percent cap on the number of Top Ten Percent law students they are required to admit each year, starting with the 2010-2011 academic year (Long et al., 2010; Harris & Tienda, 2010; Niu & Tienda, 2010). The remaining 25% will be divided between out-of-state applicants, applications with extraordinary SAT/ACT scores, and those with other exemplary criteria such as community service activities, athletic abilities, and talents in the arts (Winkle-Wagner, Sule, & Maramba, 2014). This exemption is set to be reexamined after the 2015-2016 academic year.

Higher Education Landscape in Texas

Texas has a very large higher education system, comprised of 148 not-for-profit institutions. Publicly, there are 38 universities, 50 community college districts with multiple campuses, 9 health-related institutions, 4 technical college systems, and 3 state colleges, for a total of 104 institutions. Independently, there are 30 universities, 2 junior colleges, 1 health-related institution, and 2 chiropractic institutions, for a total 44 institutions. All of these institutions are led by the Texas Higher Education Coordinating Board (THECB).

Created in 1965, THECB works to meet the goals of the state's higher education plan by providing Texans with wide access to high quality higher education (THECB, n.d.b). Additionally, several multi-campus systems exist with separate governing boards: the University of Texas system, the Texas A&M University system, the University of North Texas system, the University of Houston system, the Texas Tech University

system, and the Texas State University system. These governing boards make preliminary decisions for their member-institutions before sending recommendations to the Coordinating Board.

Texas has the second largest population in the country, with over 25 million residents (U.S. Census Bureau, 2011a). The state has experienced higher than average demographic growth and a young age structure (Tienda et al., 2003). Tienda and Sullivan (2010) noted that as of the 2010 U.S. Census, Texas was now officially considered a minority-majority state. Over 67% of the residents consider themselves non-White, with nearly 38% identifying as Hispanic or Latino (U.S. Census Bureau, n.d.). The increasingly diverse population in Texas is affecting higher education in the state. This has implications for the way colleges and universities need to educate historically underrepresented students. Policymakers in Texas need to be aware of the changing demographics of the state.

However, the Top Ten Percent law will not be able to increase diversity at public four-year institutions in Texas until the number of African American and Hispanic high school graduates increases to levels comparable with White and Asian high school graduates (Holley & Spencer, 1999; Tienda et al., 2003, Palmer, Wood, & Spencer, 2013). Also, the carrying capacity of four-year institutions in Texas will also need to expand to keep pace with the college-age population (Tienda, 2010). The legislature must also continue to fund higher education so that the carrying capacity can expand, or else “the racial/ethnic stratification of college access and choice is unlikely to decline” (Perna et al., 2005, p. 268).

Additionally, Dickson (2007) suggests several trends regarding higher education in Texas. First, while still below the national average, tuition and fees have increased substantially in the last decade. Second, student loan debt has increased, hinting that higher education has become less affordable in Texas. Even with these troubling figures, college enrollment rates have steadily increased. Finally, based on six-year graduation rates and freshmen retention rates, “the quality of the schools as captured by these measures has increased” (Dickson, 2007, p. 248).

Tier 1 challenge. In 2009, Texas began a research fund to encourage less selective institutions to strive for Tier 1 status. The term “Tier 1” is often used interchangeably with the terms “top tier”, “nationally competitive research university”, and the Carnegie Foundation designation of “research university - very high research activity” (University of Houston, 2011). However, only the state legislature can officially designate an institution as a flagship campus or Tier 1 institution. Texas currently has two public Tier 1 institutions, The University of Texas at Austin and Texas A&M University, and recently added one private institution, Rice University. This is deficient, however, as California has nine recognized Tier 1 institutions and New York has seven, both of which are large, well-populated states similar to Texas (Texas Tribune, 2011).

Eight institutions in Texas are currently striving for Tier 1 recognition to gain access to state research funds. H.B. 51 was passed during the 81st Legislature, setting up the funding structure and budget, and signed by the governor (THECB, 2009). A constitutional amendment was passed by state voters in November 2009 to fund the program (Office of the Secretary of State, 2009). It should be noted that the requirements

for Carnegie Foundation recognition and Texas recognition as top tier differ. So even though the University of Houston was recognized by the Carnegie Foundation as a “Research University – Very High Research Activity” institution, their highest designation, it cannot gain access to any additional state funding because it has not been recognized as Tier 1 by the state (Texas Tribune, 2011). However, in 2012, the state auditor recognized that “...both Texas Tech University and the University of Houston had met the state’s requirement to gain access to the National Research University Fund” (Hamilton, 2012).

Finney, Perna, and Callan (2012) recently cautioned Texas legislators against pursuing this costly program without accurately understanding all of the economic consequences. While Texas does need to expand its research capacity, funds also need to be distributed to community colleges and non-flagship universities in order to increase the number of Texans with postsecondary degrees. Projections show that “56% of all jobs in Texas will require some kind of postsecondary degree or training” (Finney et al., 2012, p. 1) by 2018. About 32% of Texans have some sort of postsecondary training, ranking Texas 39th among the states (Finney et al., 2012). Obviously, this discrepancy needs to be addressed.

Affirmative action in Texas. The issue of affirmative action continues to be a point of contention with some universities across the country. Since the *Hopwood* decision, several other court cases have challenged the use of race in admissions. In *Gratz v. Bollinger* (2003), the U.S. Supreme Court ruled that admissions policies using a race factor as a comprehensive portion of the point system were unconstitutional. That same year, the high court ruled in the *Grutter v. Bollinger* (2003) case that institutions

could use race as a factor in admissions if the review process of applicants was highly individualized and race was not the sole criteria for acceptance or rejection. Jaschik (2012) notes that after the *Grutter* (2003) ruling replaced *Hopwood*, only UT Austin started using race again as a factor to build a more diverse freshman class. He reported in February 2012 that the U.S. Supreme Court agreed to consider whether continued use of race/ethnicity in admissions decisions at the University of Texas at Austin should be allowed. In *Fisher v. University of Texas at Austin*, the complainants were arguing that the Top Ten Percent law already addresses the issue of diversity and therefore the university does not need to use race as a factor in assessing the remaining applicants (McNearney, 2012).

Jaschik (2015) reported that the case was heard in late 2012 and in 2013 the Supreme Court remanded the case back to the lower courts to apply “strict scrutiny” to the UT Austin policies. He further conveyed that in July 2014 the Fifth Circuit Court of Appeals upheld the UT Austin admissions plan and Fisher once again appealed that ruling to the U.S. Supreme Court. Arguments for *Fisher II* were heard in late 2015 with a decision handed down in June 2016. The 2013 ruling charged “colleges and universities with *verifying the necessity* of their plans” (Greytak, 2014, p. 64). The recent 2016 ruling did not “tighten the current principles in a manner less hospitable to affirmative action” as many observers had predicted (Jaschik, 2015). The Justices held, in a 4-3 decision, that UT Austin’s use of race-conscious admissions was lawful under the Equal Protection Clause (*Fisher v. UT Austin*, 2016). This ruling allows UT Austin and other institutions around the country to continue to use race in a limited capacity in admissions decisions.

Gaps in the Literature

Prior research on this subject does not cover the extent of the issue, however. Long and Tienda (2010) conducted a study examining minority enrollment levels using five non-flagship institutions and the two flagships in Texas with enrollment data thru 2002-2003. A sample of five institutions does not seem representative of the over 30 four-year, public institutions in the state, nor does it survey enough years under the Top Ten Percent law. Hicklin (2007) completed a study using all four-year institutions in the states affected by the *Hopwood* ruling and Proposition 209 legislation. These states include California, Louisiana, Mississippi, and Texas. However, her data only spanned 1990-2000. For the purposes of a study on Texas, this only covers three incoming freshman classes under the Top Ten Percent law. Neither of these studies yield nearly enough data to make any kind of policy recommendations or draw any implications about the effectiveness of the law. Finally, as previously mentioned, the two flagship institutions are educating only 20.2% of the students enrolled in public, four-year colleges in Texas (THECB, 2011). Therefore, nearly 80% of the bachelor's degree-earning college population in Texas has been excluded from most prior research on this topic.

Summary

The four sections in this chapter review previous research central to this study. First, this chapter identified the relevant college access and choice literature. Second, the organizational differences between flagship and non-flagship institutions were discussed. Third, state-level higher education policies were explored. Finally, the Top Ten Percent law of Texas was examined along with the higher education landscape of the state.

CHAPTER 3

DATA AND RESEARCH METHODS

The purpose of this study was to examine the impact of Texas' Top Ten Percent law on the racial composition of the public, non-flagship four-year institutions in the state. To that end, this study explored the two research questions introduced in chapter one and the three hypotheses presented below.

The previous chapter addressed the literature surrounding the broad topic as well as the motivation for the research. This chapter begins by explaining the research questions and hypotheses driving the study. Then the method of analysis is introduced. Next, the data sources are identified, the sample is clarified, and the variables to be analyzed selected. The models to be utilized with related equations are described next. The chapter ends with a discussion of the limitations of the current study.

Research Questions

As previously mentioned in chapter one, one broad question guided this study: What impact did the Top Ten Percent law have on the public, non-flagship, four-year institutions in Texas? From this broad idea, two sub-questions emerged:

1. What is the relationship between the Top Ten Percent law and racial/ethnic diversity at public, non-flagship, four-year institutions in Texas?
2. After controlling for the Top Ten Percent law and other factors, what is the relationship between the enrollment of African American and Hispanic

students at public, non-flagship, four-year institutions in Texas and the institutions' selectivity level and location (urban, suburban, rural)?

Research Hypotheses

Based on findings from previous studies reviewed in chapter two, I specified three hypotheses related to this study's research questions.

Hypothesis 1: Public, non-flagship, four-year institutions in Texas will become more racially/ethnically diverse as a result of the Top Ten Percent law.

There are very few studies regarding the Top Ten Percent law that utilize data on non-flagship institutions. As noted in chapter 2, Hicklin (2007) and Long and Tienda (2010), using a limited number of institutions and years, found that after implementation of the Top Ten Percent law, minority students were redistributed to non-flagship institutions in Texas. While interesting, these studies by no means explain if a trickle-down effect impacted all non-flagship, four-year institutions in Texas.

Hypothesis 2: Public, non-flagship, four-year institutions in Texas considered less selective (i.e. not labeled highly competitive, very competitive, or competitive+) will become more racially/ethnically diverse after controlling for the implementation of the Top Ten Percent law.

Several previously mentioned studies (Furstenberg, 2010; Hicklin, 2007; Melguizo, 2008) found that the selectivity level of an institution affected racial/ethnic diversity, with the most selective institutions being less diverse.

Hypothesis 3: Public, non-flagship, four-year institutions in Texas located in urban or suburban areas will become more racially/ethnically diverse than

those located in rural areas after controlling for the implementation of the Top Ten Percent law.

Long et al. (2010) found that the urbanicity of a college impacted the number of minority applicants. They suggested that college-aspiring high school students may be more inclined to attend a college or university in an urban or metropolitan setting due to preconceived notions about non-metropolitan areas. Hillman and Weichman (2016) determined that the majority of first-time, first-year freshman "...attending public four-year institutions enroll within 50 miles of their permanent home" (p. 2).

Panel Data

A panel dataset was constructed for this study, consisting of 1638 observations. The dataset spans the years 1988-2009 (excluding 1989) and includes 78 institutions. There are many advantages to using panel data over cross-sectional or time-series datasets. Panel data combine both time-series and cross-sectional data, allowing the researcher to "follow multiple subjects over multiple time periods, thereby providing both variation across subjects and changes over time" (Zhang, 2010, p. 312). Panel datasets allow for explanations of within-unit changes (i.e. within institutions) over time, instead of merely comparing changes between-units. They are also able to control for the effects of missing and unobserved variables in a more natural way (Hsiao, 1986). This added depth leads to more robust results.

This panel dataset examines underrepresented student enrollment patterns in Texas, Colorado, Illinois, New York, and North Carolina. Also, panel data allows for a greater number of degrees of freedom by increasing the sample size and decreasing multicollinearity among explanatory variables (Hsiao, 1986). Panel datasets allow for the

ability to control for individual heterogeneity, decreasing the effect of omitted variable bias (Zhang, 2010). Finally, the panel dataset allowed for a difference-in-difference model to be employed.

Difference-in-Difference

To test for the effect of the Top Ten Percent law, comparisons need to be made of the racial composition of institutional student populations before and after implementation. The difference-in-difference method made this comparison possible. Simply stated, two groups are observed at two points in time. One group is exposed to a policy (treatment group) while the other is not (control group). The change between the two time periods for the control group is subtracted from the change between the two time periods for the treatment group. If the difference between the two groups is permanent, “the subtraction will remove the bias from simply comparing these two subjects in the second time period or from comparing the before and after values for the treatment group” (Zhang, 2010, p. 328). Difference-in-difference studies use the program adoption as a natural experiment, allowing for the observation of the direction and magnitude of changes within institutions and between states (Zhang & Ness, 2010).

According to Zhang and Ness (2010), selecting the counterfactual, or what would have happened in the absence of the program, is the most difficult task. In the difference-in-difference method, the selection of the comparable group is central because the differences in the before and after periods in the state of interest (i.e. Texas) are replaced by the differences in the corresponding periods in the comparable states (i.e. Colorado, Illinois, New York, and North Carolina) (Zhang & Ness, 2010). They also note that the difference-in-difference model makes the assumption that the time effects are the same

for the control and treatment groups. Zhang (2010) adds the assumption that no other time-varying group level factors besides the policy in question have affected the dependent variable.

A word of caution should be noted here. Most regression models assume that observations are independently, identically distributed (Wooldridge, 2009). This is not a realistic assumption in most panel data analyses. Heteroskedasticity and autocorrelation are common problems when analyzing panel data sets. Heteroskedasticity occurs when the variance in the error term varies across cases or sections. Autocorrelation occurs when the error terms corresponding to the same case or section under analysis are not independent over time. Autocorrelation will generally always be violated in panel datasets because observations are often predicated on the year before. These issues will be addressed later in the chapter.

Comparison states. This study differs from many other studies on the Top Ten Percent law. The focus here is on the Top Ten Percent law intervention itself, aimed at alleviating enrollment discrepancies related to a ban on affirmative action policies at the postsecondary level. To set up the panel data model, I searched for comparison states similar to Texas, with few postsecondary innovations over the past 20 years. Therefore, other states with affirmative action bans (ex. Arizona, California, Louisiana, Mississippi, Nebraska, Oklahoma, and Washington) would not be good comparison states since they all enacted bans within higher education around the same time period as the proposed study. Merit-based aid states also were not good comparisons because, as previously stated in the chapter two section on state-level higher education financial policies, merit aid changes enrollment patterns within a state (ex. Alaska, Florida, Georgia, Kentucky,

Louisiana, Massachusetts, Michigan, Missouri, Nevada, New Mexico, South Carolina, Tennessee, and West Virginia). Since it is posited that the Top Ten Percent law also changes enrollment policies, a state having had no major higher education policy changes is desirable for comparison. The remaining 29 states were examined using 2010 U.S. Census data on the following variables for a large or increasing: number of public, postsecondary, 4-year institutions; size of the state population; percent of population identifying as non-White; and percent of population identifying as Hispanic or Latino. Use of performance funding was a final metric used to eliminate possible states from the study since Texas did not use performance funding for the duration of this study (Snyder, 2015). As a result, Colorado, Illinois, New York, and North Carolina were chosen as the comparable states for the study.

Colorado. As of the 2010 U.S. Census, Colorado was ranked 22nd in total state population, with just over 5 million residents. However, Colorado has a growing Hispanic population, with nearly 21% of residents reporting as such. Nationally, only 16% of the population identifies as Hispanic. Overall, 39% of the state population identifies as non-White.

The Colorado Commission on Higher Education (CCHE), located within the Colorado Department of Higher Education (CDHE), was established in 1965 by the state legislature (CDHE, n.d.). Higher education in Colorado is governed by the CDHE, which oversees over 470 institutions of all types: 2-year, 4-year, public, private, non-profit, and for-profit. CCHE develops long-range plans for higher education in the state, including approving degree plans, distributing formula funding, and establishing statewide admission standards. Colorado higher education has also endured a couple of failed

reform attempts. Senate Bill 59, known as the “Automatic Admission Act of 2000”, a top 20% percent plan, was indefinitely tabled in 2000 (Shushok, 2001). In 2008, voters rejected a ballot measure to ban affirmative action (National Conference of State Legislatures, 2011).

Illinois. According to the 2010 U.S. Census, Illinois is the 5th most populated state in the country, with more than 12.8 million residents. Over 44% of the population identifies as non-White, with nearly 16% identifying as Hispanic/Latino. Illinois also has a coordinating board structure (Illinois Board of Higher Education (IBHE)), created in 1961. IBHE oversees 12 public colleges and universities, 97 independent colleges and universities, and 48 community colleges, for a total of 157 institutions (IBHE, n.d.). The state has not had any major higher education admissions initiatives in the past 20 years.

Illinois is projected to face some similar challenges as Texas. The Hispanic population in Illinois is expected to grow rapidly over the next 20 years as is the need for an educated workforce (Perna, Finney, & Callan, 2011). Both states face shrinking appropriation amounts from their legislatures and have consequently started to raise tuition rates significantly (Alexander & Layzell, 2007).

A recent report by Perna et al. (2011) noted that during the 1990s, Illinois was an education leader in college preparation, enrollment, and affordability. They report, however, that Illinois has started to register declines in higher education performance, high school graduation rates, college enrollment, and equity. Many of these problems can be tied to the dissolution of the governing “system of systems” (Perna et al., 2011). Finally, the need-aid program, called the Monetary Award Program (MAP), which began in 1967, has had many years to become established (Illinois Board of Higher Education,

2010). Since MAP was implemented over 20 years before the span of this study, there should be little interference with the data.

New York. As of the 2010 U.S. Census, New York ranked 3rd in overall population, with 19.4 million residents. African Americans comprise nearly 16% of the population, while Hispanics make up 17.6%. Overall, almost 52% of the states' residents consider themselves non-White.

According to the New York State Education Department (2011), all colleges and universities in New York State are members of The University of the State of New York. This entity governs all education in New York, from preschool through postdoctoral. The Board of Regents supervises all educational activities within the state and presides over The University, functioning as a coordinating board. The University consists of 271 public, private, and for-profit degree-granting institutions, operating 373 main and branch campuses as well as 1800 other locations.

All of the public, 4-year institutions fall within either the State University of New York (SUNY) or City University of New York (CUNY) systems. Each of these systems has a governing board and administration. SUNY is comprised of 34 campuses while CUNY consists of 13 senior colleges. CUNY campuses are all located in New York City, while SUNY campuses are located throughout the State of New York.

North Carolina. The 2010 U.S. Census determined that 9.5 million people reside in North Carolina, ranking it 10th in population. Of those counted, 21.5% of the population reported as African American. Additionally, another 8.4% considered themselves Hispanic. Nearly 40% of the population reported as non-White.

North Carolina consists of 111 not-for-profit institutions: 58 community colleges, 36 independent institutions, and 16 public four-year institutions. The University of North Carolina is a multi-campus university with 16 institutions. It encompasses all of the public, four-year institutions in the state. The Board of Governors has policymaking responsibilities for all institutions within the University. Additionally, each campus has a Board of Trustees in charge of planning and decision-making and is headed by a Chancellor (University of North Carolina, n.d.).

Data Sources

This study utilized institution level data from the Integrated Postsecondary Education Data System (IPEDS) source for the fall semester enrollment, race/ethnicity, gender, and tuition/fee variables. The National Center for Educational Statistics (NCES) provided the IPEDS data. The data span the years 1988-2009. Prior to 1990, institutions reported data only in even numbered years, therefore 1989 is excluded from this study. IPEDS enrollment and race/ethnicity data was cross-checked with data available from the Texas Higher Education Coordinating Board website, when available.

The financial aid data was culled from the Delta Cost Project database. The data was reported from 1988 to 2009. The value of each entry is the sum of all Pell, Federal, state, local, and institutional grants for that particular institution and year. U.S. Census Bureau data along with cutoff values from the U.S. Department of Labor and Statistics were used to create the urbanicity variable. Several issues of *Barron's Profile of American Colleges* were searched to create the selectivity variable. The Carnegie Foundation classification system was used to determine which institutions were considered flagships, or "very high research activity."

Sample

The sample included public, four-year colleges and universities from Texas, Colorado, Illinois, New York, and North Carolina. Texas was the intervention state, with an implementation date of 1998. As stated above, Colorado, Illinois, New York, and North Carolina were chosen as the comparison states. The sample includes 25 institutions from Texas, 10 from Colorado, 7 from Illinois, 28 from New York, and 8 institutions from North Carolina, for 78 total institutions (see Table 1). Forty institutions, five from Colorado, four from Illinois, nine each from New York and North Carolina, and 13 from Texas were excluded from the study (see Table 2). Institutions were excluded because they a.) are flagship institutions, b.) only offer upper-level coursework, c.) did not admit freshmen prior to 1998, d.) are an HBCU or otherwise have a first-time, first year population of over 85% African American, e.) are special focus institutions, f.) only offered two-year degrees in 1998, or g.) did not exist prior to 1998. These omissions were valid because the study is focused on first-time, first-year freshmen at non-flagship institutions and is especially interested in the 1998 implementation date of the Top Ten Percent law in Texas. Community colleges and other 2-year institutions, as well as private institutions in Texas were exempt from the law and therefore omitted from the study.

HBCUs were excluded since they already have high minority enrollment levels. Nationally, African American student enrollment slightly outnumbers Hispanic student enrollment. From 1988-2009, the first-time, first-year enrollment numbers in Colorado, Illinois, New York, North Carolina, and Texas combined, was 397,139 African American students enrolled in college versus 331,830 Hispanic students. In this study, Texas had 2

HBCUs and 7 MSIs compared to 5 HBCUs and 8 MSIs for all the other comparison states. Federally, HBCUs are defined as institutions that were founded before 1964 to educate black Americans. Two of the eight MSIs from the comparison states overwhelmingly enroll African American students but do not meet the federal definition of an HBCU, but were still excluded. The remaining MSIs have enrollment numbers of at least 50% for the combination of African American and Hispanic students and are identified as minority serving by the U.S. Department of Education. All seven MSIs from Texas are Hispanic Serving Institutions.

Methodology

Dependent Variables

In this study, three different dependent variables were examined that represent underrepresented student enrollment levels at colleges and universities. The raw data was converted to a percentage in each instance by dividing the particular racial/ethnic category by the total enrollment for the enrollment-level in question. IPEDS reported the following race/ethnicity categories: White, Black, Hispanic, Asian or Pacific Islander, and American Indian or Alaska Native.

All the dependent variables are based on percentages of first-time, first-year (FTFY) minority students. Since the Top Ten Percent law focuses mainly on freshmen enrollment, this subcategory was critical. The first dependent variable was defined as the combined percentages of African American and Hispanic first-time, first-year students at an institution (*Percftfyah*). The second and third dependent variables were defined as the percentage of African American or Hispanic first-time, first-year students at an

institution (*Percftfyaa* and *Percftfyh*, respectively). IPEDS was able to generate enrollment data on first-time, first-year students, enhancing this study.

Independent Variables

Several independent variables were identified in the literature and previous studies suggesting an impact on structural diversity at colleges and universities. They fell into four general categories. The first group of variables (*T'*) represents the main purpose of the study, the difference-in-difference model. A dummy variable was constructed to represent the Top Ten Percent law intervention. This variable identified the intervention (*Ttpl*), with 1 representing institutions in Texas from 1998 to present and 0 representing all other instances. To control for time series effects on the dependent variables, a dummy variable for year was constructed ($T_1 - T_{21}$) (*Time*). A control for the population change in each state each year was constructed as well. This variable was important to add to control for natural increases in the minority population in each state that may be contributing to increased minority enrollment rates at institutions. The percentage of the state population that is African American or Hispanic was used in simulation 1 (*Percstaah*). The percentage of the state population that was African American was used in simulation 2 (*Percstaa*). Finally, the percentage of the state population that identified as Hispanic was constructed (*Percsth*) and used in simulation 3.

The second group of variables (*E'*) represents undergraduate or first-time, first-year population student characteristics. Total undergraduate enrollment, in thousands, was constructed to serve as a proxy for the size of the institution (*Totugenrlk*). Then, a variable representing gender was constructed, denoting the percentage of first-time, first-year students categorized as women (*Percftfyf*). Furstenberg (2010) suggests that the

gender of minority applicants may alter application patterns, with female minority applicants increasingly applying and matriculating at colleges and universities. This group of variables is continuous.

The third group of variables (M') represents the monetary variables used in the study. The college access and choice literature suggests that misinformation regarding college costs are a large deterrent for low-SES and African American and Hispanic families. Therefore, financial variables such as tuition and fees, as well as financial aid variables such as awards of Pell grants and scholarships, should be examined. An independent variable was created to represent the tuition and fees, in thousands of dollar, charged to an in-state student for the fall semester ($Tfconk$), gathered from IPEDS. Another independent variable consisted of the amount of aid, in millions of dollars (Pell, federal, state, local, and institutional grants, including scholarships and fellowships) distributed to students at the institution ($Aidconmil$), using Delta Cost Project data. Both of these monetary values were adjusted for inflation using the Consumer Price Index (base year 2009). This group of variables is also continuous.

The fourth and final group of variables (I') represents the fixed institutional characteristics of selectivity, urbanicity, minority serving institution, and state. All of these variables were dichotomous nature. First, two variables were constructed to represent the selectivity level of the institution by comparing values from several editions of *Barron's Profiles of American Colleges*. An institution rated as competitive+, very competitive, or highly competitive equals one (14 institutions) and all others (competitive, less competitive, and non-competitive) equal zero (64 institutions) for the highly selective variable ($Highsel$). For the medium selective variable ($Medsel$),

institutions rated as competitive equal 1 (35 institutions), all others equal zero (43 institutions). Hoxby (2009) noted that the selectivity level of colleges and universities has changed very little since the 1960s. During the time period covered by this study no institutions changed categories. These variables were added to help make a more distinct comparison between different types of institutions and help see if and how selectivity matters at non-flagships.

Second, the urbanicity level of the city where the college or university was located (*Urb*) was determined. U.S. Census data from 1990, 2000, and 2010 was compiled. Then, using the population size designations from the U.S. Department of Labor, institutions were designated as rural (population < 50,000), suburban (population 50,000 to 1,500,000), or urban (population > 1,500,000). Institutions located in urban or suburban areas designated as equal to one and rural equal to zero. In this study, 41 institutions were coded as urban or suburban and 37 were coded as rural. Only one institution in the sample changed urbanicity categories during the duration of the study: Texas A&M University at Galveston. Until the 2010 Census, Galveston consisted of over 50,000 residents. One major contributing factor to the change in category would be Hurricane Ike, which devastated the city in 2008. Since official census data is only collected every 10 years and the potential change of category coding would likely only need to be adjusted for one year and one institution, the decision was made to leave Texas A&M at Galveston coded as suburban for all years of the study.

Third, following the lead of Hicklin (2007), a dummy variable to identify Minority Serving Institutions (MSI) was created (*Msi*, =1 if MSI, =0 if all others). This was necessary since MSIs by definition enroll primarily non-White students. For the

purposes of this study, to be considered an MSI, the institution must be designated a minority serving institution by the U.S. Department of Education. This generally means the institutions have an enrollment level for the specified race/ethnicity of 50% or above. For this study, 13 institutions were identified as MSIs. Finally, a variable to identify the state of the institution was constructed, with 1 being equal to Texas and 0 being equal to all other states (St). The dichotomous variables use the zero value as the reference category and are therefore omitted from the equations. Table 3 summarizes the variables and data sources used in this study.

General Model

The primary goal of this study is to determine whether underrepresented student enrollment levels increased at public, non-flagship, four-year institutions in Texas after implementation of the Top Ten Percent law. To that end a panel data set was constructed to look at both time-series and cross-sectional variables simultaneously. As previously stated, a difference-in-difference model is being used to test the impact of an intervention (in this case the Top Ten Percent law in Texas) on a dependent variable (minority enrollment).

The basic general equation for the difference-in-difference model using panel data is represented by

$$Y_{it} = \alpha + \beta S_i + \gamma X_t + \delta(Ttpl) + U_{it} , \quad (1)$$

where the dependent variable at institution i and time t is a function of fixed state effects (S_i), fixed time effects (X_t), and the interaction of the state with the intervention and the years the intervention took place ($S_i * M_t$) represented by $Ttpl$. The constant is represented by α , the error term is represented by U_{it} and β , γ , and δ are parameters to be

estimated. It should be noted that δ gives evidence about whether the intervention is relevant.

Specific Equations and Simulations

This study expands upon that basic general equation in the following ways to create four variations that were then entered into STATA using both fixed effects and random effects modeling for each dependent variable simulation. The four model specifications used for each simulation in this study are as follows:

$$(A) Y_{it} = \alpha + \beta T' + U_{it}$$

$$(B) Y_{it} = \alpha + \beta T' + \gamma E' + U_{it}$$

$$(C) Y_{it} = \alpha + \beta T' + \gamma E' + \delta M' + U_{it}$$

$$(D) Y_{it} = \alpha + \beta T' + \gamma E' + \delta M' + \theta I' + U_{it}$$

where T' , E' , M' , I' are sets of independent variables described earlier and the dependent variable Y_{it} is represented as follows: simulation 1 = combined percentages of first-time, first-year students identified as African American or Hispanic (*Percftfyah*), simulation 2 = percentage of enrolled first-time, first-year students identified as African American (*Percftfyaa*), and simulation 3 = percentage of first-time, first-year students identified as Hispanic (*Percftfyh*).

Fixed Effects vs. Random Effects

For this study, the decision needed to be made whether to use fixed effects or random effects for each model simulation. According to Torres-Reyna (2007), fixed effects models make the assumption that the units of analysis have a fixed impact on the dependent variable that varies over time. Fixed effects models assumes that the error term and the constant are not correlated, thereby yielding unbiased estimates for the

explanatory variables (Toutkoushian, 2016). Fixed effects “...removes the effect of those time-invariant characteristics so we can assess the net effect of the predictors on the outcome variable” (Torres-Reyna, 2007, p. 9). However, fixed effects models have a couple of limitations. As noted by Zhang (2010), fixed effects models use a large number of degrees of freedom in creating the dummy variables of each individual or institution. Also, any time-invariant characteristics (such as gender or location) are subsumed in the error term, thereby making it impossible to yield estimates for those types of variables. This study consists of several time-invariant variables (*Hghsel*, *Medsel*, *Urb*, *Msi*, *St*).

The random effects model allows for time-invariant variables to be considered in the model. Random effects models make the assumption that the variation across entities is “...random and uncorrelated with the independent variables included in the model” (Torres-Reyna, 2007, p. 25). It also uses less degrees of freedom. The drawbacks for random effects models are that estimates can be biased, inconsistent, and difficult to interpret and explain (Zhang, 2010; Toutkoushian, 2016). The results for both fixed and random effects models are presented in Chapter 4.

As noted previously in this chapter, panel data can be affected by autocorrelation and heteroskedasticity. Both the fixed and random effects models were estimated in version 14 of STATA using the XTREG command as outlined by Toutkoushian and Hillman (2012). For fixed effects, the command was as follows: XTREG Y X, VCE(CLUSTER UNITID) FE. For random effects XTREG Y X, VCE(CLUSTER UNITID) RE was used. For both estimations, Y = dependent variable, X = the set of independent variables for that iteration of the model, FE = fixed effects estimator, RE =

random effects estimator, and VCE(CLUSTER UNITID) = the procedure to account for autocorrelation and heteroskedasticity by obtaining consistent standard errors as suggested in Bertrand, Duflo, and Mullainathan (2004) with UNITID indicating the identified cross-sectional variable for the dataset.

Limitations

There are several technical limitations to this study. First, finding states in the U.S. with a comparable population of similar ethnic breakdown and an equivalent number of institutions to Texas that have not had a major, enrollment-pattern changing higher education initiative was not possible. As of the 2010 U.S. Census, Texas was deemed a minority-majority state (Tienda & Sullivan, 2010). A state such as California, with a large Hispanic population, was not applicable because they also have a ban on affirmative action through Proposition 209 as well as a percentage plan for college enrollment. Most SREB states have some variation of a merit-aid scholarship, which also changes college enrollment patterns or were also part of the Fifth Circuit Court of Appeals and therefore subject to the *Hopwood* ruling. Many states also do not support enough colleges and universities to be viable in this study.

Second, the sample size was not very large. This ties back to the previous limitation of finding comparable states. The study was limited to 78 institutions total. The panel data approach, with over 20 years of entries, helped to maximize the small sample size and increase the degrees of freedom for the study. As a rule, a larger sample size reduces the uncertainty and allows for better generalizations regarding the results.

Third, this research on the Top Ten Percent law was limited by time. In 2010 the Texas state legislature granted The University of Texas at Austin a partial exemption

towards the law. UT Austin only has to admit 75% of its freshman cohort under the law, with the other 25% containing out-of-state and/or international students, and in-state students from other deciles (Harris & Tienda, 2010). As a result, data collection and analysis from 2010 to present regarding the Top Ten Percent law was artificially altered. Some students that previously qualified for UT Austin under the Top Ten Percent law may have had to make other arrangements while some lower decile students may have attended UT Austin when they would have attended other non-flagship, public institutions in previous years.

In addition, the use of dichotomous variables for several of the hypotheses being examined in this study limited the use of the most appropriate statistical models. In a fixed effects model, dichotomous variables are omitted due to collinearity. More often than not, fixed effects models are more accurate estimates due to errors not being correlated with the regressors. For future iterations of this study, the urbanicity variable could be recoded using actual Census data population numbers instead of broad area or location categories. The selectivity variable could also be reconstructed using average SAT score of each incoming freshman class as a proxy.

Summary

This chapter outlined the research questions and hypotheses driving this study. Then the necessity of using panel data and difference-in-difference method were described. The data sources, sample, and variables were all explained in detail. The models and equations were delineated to explain the effect of racial composition changes in colleges and universities in Texas. Finally, the limitations of this study were discussed.

Table 1. Institutions Included in Study

Institution	State
Adams State University	CO
Colorado Mesa University	CO
Colorado School of Mines	CO
Colorado State University-Pueblo	CO
Fort Lewis College	CO
Metropolitan State University of Denver	CO
University of Colorado at Colorado Springs	CO
University of Colorado Denver	CO
University of Northern Colorado	CO
Western State Colorado University	CO
Eastern Illinois University	IL
Illinois State University	IL
<i>Northeastern Illinois University</i>	IL
Northern Illinois University	IL
Southern Illinois University Carbondale	IL
Southern Illinois University Edwardsville	IL
Western Illinois University	IL
Alfred State College	NY
Binghamton University (SUNY)	NY
Buffalo State College	NY
CUNY Baruch College	NY
CUNY Brooklyn College	NY
<i>CUNY City College</i>	NY
<i>CUNY City Tech</i>	NY
CUNY College of Staten Island	NY
CUNY Hunter College	NY
<i>CUNY John Jay College of Criminal Justice</i>	NY
<i>CUNY Lehman College</i>	NY
CUNY Queens College	NY
<i>CUNY York College</i>	NY
Farmingdale State College	NY
Morrisville State College	NY
Purchase College-SUNY	NY
SUNY Cobleskill	NY
SUNY College at Brockport	NY
SUNY College at Old Westbury	NY
SUNY Cortland	NY

Table 1 (continued). Institutions Included in Study

SUNY Fredonia	NY
SUNY Geneseo	NY
SUNY Maritime College	NY
SUNY New Paltz	NY
SUNY Oneonta	NY
SUNY Oswego	NY
SUNY Plattsburgh	NY
SUNY Potsdam	NY
Appalachian State University	NC
East Carolina University	NC
University of North Carolina at Asheville	NC
University of North Carolina at Charlotte	NC
University of North Carolina at Greensboro	NC
University of North Carolina at Pembroke	NC
University of North Carolina-Wilmington	NC
Western Carolina University	NC
Angelo State University	TX
Lamar University	TX
Midwestern State University	TX
Sam Houston State University	TX
Stephen F. Austin State University	TX
<i>Sul Ross State University</i>	TX
Tarleton State University	TX
<i>Texas A&M International University</i>	TX
Texas A&M University at Galveston	TX
Texas A&M University-Commerce	TX
Texas A&M University-Corpus Christi	TX
<i>Texas A&M University-Kingsville</i>	TX
Texas State University-San Marcos	TX
Texas Tech University	TX
Texas Woman's University	TX
The University of Texas at Arlington	TX
The University of Texas at Dallas	TX
<i>The University of Texas at El Paso</i>	TX
<i>The University of Texas at San Antonio</i>	TX
The University of Texas of the Permian Basin	TX
<i>The University of Texas-Pan American</i>	TX
University of Houston	TX

Table 1 (continued). Institutions Included in Study

<i>University of Houston-Downtown</i>	TX
University of North Texas	TX
West Texas A & M University	TX

*Note: Institutions in italics are designated as Minority Serving by the U.S. Department of Education

Table 2. Institutions Excluded from Study

Reason for Exclusion	Institution Name
Flagship institution	Colorado State University
	University of Colorado Boulder
	University of Illinois at Chicago
	University of Illinois at Urbana-Champaign
	Stony Brook University (SUNY)
	University at Albany-SUNY
	University at Buffalo (SUNY)
	North Carolina State University
	University of North Carolina at Chapel Hill
	Texas A&M University
	University of Texas at Austin
Only offers upper-level courses	UC Denver-Anschutz Medical campus
	Governor's State University
	University of Illinois-Springfield
	Sul Ross State University-Rio Grande College
	Texas A&M University-Central Texas
	University of Houston-Clear Lake
	University of North Texas at Dallas
No freshmen prior to Fall 1998	SUNY Polytechnic Institute
	North Carolina School of Science & Math
	Texas A&M University-Texarkana
	University of Houston-Victoria
	University of Texas at Brownsville
	University of Texas at Tyler
HBCU	Chicago State University
	CUNY Medgar Evers College
	Elizabeth City State University
	Fayetteville State University
	North Carolina A&T State University
	North Carolina Central University
	Winston-Salem State University
	Prairie View A&M University
	Texas Southern University

Table 2 (continued). Institutions Excluded from Study

Not established prior to 1998	CSU-Global
	Macaulay Honors College (CUNY)
	Texas A&M University-San Antonio
Special Focus Institution	Empire State College
	UNC School of the Arts
Only offered Associate's in 1998	SUNY Canton
	SUNY Delhi

Table 3. Definitions and Sources of Variables Used

Variable Definition	Source
Dependent variables	
Percentage of enrolled FTFY students identified as African American + Hispanic (<i>Percftfyaah</i>)	IPEDS Enrollment Survey (derived)
Percentage of enrolled FTFY students identified as African American (<i>Percftfyaa</i>)	IPEDS Enrollment Survey (derived)
Percentage of enrolled FTFY students identified as Hispanic (<i>Percftfyh</i>)	IPEDS Enrollment Survey (derived)
Independent variables	
Post top ten percent law (1=institution in Texas from 1998 to present, 0=other) (<i>Ttpl</i>)	Derived by author
Time designation from 1988-2009, excluding 1989 (T ₁ -T ₂₁) (<i>Time</i>)	Derived by author
Percent of state population each year, African American and Hispanic (<i>Percstaah</i>)	U.S. Census Bureau (derived)
Percent of state population each year, African American (<i>Percstaa</i>)	U.S. Census Bureau (derived)
Percent of state population each year, Hispanic (<i>Percsth</i>)	U.S. Census Bureau (derived)
Total undergraduate enrollment, in thousands (<i>Totugenrlk</i>)	IPEDS Enrollment Survey (derived)
Percentage of enrolled FTFY students identified as female (<i>Percftfyf</i>)	IPEDS Enrollment Survey (derived)
Average undergraduate student tuition/fees fall semester (in thousands) (constant 2009 dollars) (<i>Tfconk</i>)	IPEDS Student Charges survey
Amount of financial aid (per institution, in millions; constant 2009 dollars) (<i>Aidconmil</i>)	Delta Cost Project dataset
Highly selective institutions (1=very competitive, highly competitive, or competitive+, 0=competitive, less competitive or non-competitive) (<i>Highsel</i>)	Barron's Profiles of American Colleges
Medium selective institutions (1=competitive, 0=very competitive, highly competitive, competitive+, less competitive, or non-competitive) (<i>Medsel</i>)	Barron's Profiles of American Colleges
Urbanicity level of institution location (1=urban or suburban, 0=rural) (<i>Urb</i>)	U.S. Census Bureau (1990, 2000, 2010)
Minority Serving Institution (1=yes, 0=no) (<i>Msi</i>)	IPEDS Enrollment Survey (derived)
State (1=TX, 0 = other) (<i>St</i>)	Derived by author

Note: FTFY stands for first-time, first-year and designates recent high school graduates enrolled for the first time in college (excluding any dual enrollment courses)

CHAPTER 4

FINDINGS

The previous chapter addressed the dataset, sample, and methodology for the study. This chapter begins by displaying the descriptive statistics and correlations for the variables used in the study. Then the results from the four regression models using both fixed and random effects for each of the three dependent variables are presented and explained.

As a reminder, one broad question guided this study: What impact did the Top Ten Percent law have on the public, non-flagship, four-year institutions in Texas? The following research questions were investigated:

1. What is the relationship between the Top Ten Percent law and racial/ethnic diversity at public, non-flagship, four-year institutions in Texas?
2. After controlling for the Top Ten Percent law and other factors, what is the relationship between the enrollment of African American and Hispanic students at public, non-flagship, four-year institutions in Texas and the institutions' selectivity level and location (urban, suburban, rural)?

Descriptive Statistics

Table 4 presents the descriptive statistics for the variables utilized in the study. The maximum number of observations was 1638. Several variables had less than the maximum number of observations. First-time, first-year enrollment data was not available for UT-Permian Basin and UT-Dallas in 1988 and 1990, TAMU-Corpus Christi

Table 4. Descriptive Statistics

Variable	Mean	Standard Deviation	Min	Max
Percent FTFY African American + Hispanic	27.34	22.73	2.00	97.48
Percent FTFY African American	11.12	10.72	0.00	56.05
Percent FTFY Hispanic	16.22	19.15	0.00	97.06
Top Ten Percent law	0.18	0.38	0.00	1.00
Time	11.00	6.06	1.00	21.00
Percent State Population African American + Hispanic	32.05	8.30	17.01	46.89
Percent State Population African American	13.72	4.85	3.71	22.21
Percent State Population Hispanic	18.34	9.54	1.16	35.36
Total UG Enrollment	8.85	5.68	0.61	29.30
Percent FTFY Female	53.58	11.02	4.14	99.84
Tuition/Fees	4.02	1.60	0.70	12.24
Financial Aid	20.67	18.89	0.67	141.53
High Selectivity	0.18	0.38	0.00	1.00
Medium Selectivity	0.45	0.50	0.00	1.00
Urbanicity	0.53	0.50	0.00	1.00
Minority Serving Institution	0.17	0.37	0.00	1.00
State	0.32	0.47	0.00	1.00

****Note:** Data not available for any institution in 1989. Other missing data noted in text. FTFY stands for First-Time, First-Year. UG stands for undergraduate. All variables have 1638 observations, except for those with FTFY in the name, which have 1623 observations. All Percent State Population variables have 1560 observations, excluding 1988. The monetary values were adjusted for inflation (CPI=year 2009).

from 1988 to 1993 this time these institutions were transitioning from upper-division to four-year institutions. Since they all have some reported first-year enrollment data prior to the 1998 implementation date of the Top Ten Percent law, they were included in the study.

Table 5 displays the selected correlations. Values from ± 0.00 -0.30 were considered weak, ± 0.30 -0.60 moderate, and ± 0.60 -1.00 as strong correlations. A

Table 5. Selected Correlations

Variable Combination	Value
Top Ten Percent law x Time	0.3519
Top Ten Percent law x Percent FTFY African American	0.0016
Top Ten Percent law x Percent FTFY Hispanic	0.3491
Percent State Hispanic x Top Ten Percent law	0.7454
Percent FTFY African American x Percent FTFY Female	0.2287
Percent FTFY African American x Minority Serving Institution	0.3298
Percent FTFY Hispanic x Minority Serving Institution	0.7942
Tuition/Fees x Percent FTFY African American + Hispanic	-0.1151
Urbanicity x Financial Aid	0.4013
State x Percent FTFY African American	-0.0602
State x Percent FTFY Hispanic	0.4092
State x Tuition/Fees	-0.2938

Note: All correlations of 0.0556 or higher and -0.0500 or lower were statistically significant at the 5% level. FTFY stands for First-Time, First-Year.

majority of the correlations from the full table were very weak. Time (*time*) was only moderately, positively correlated to Top Ten Percent law (*Ttpl*). The Top Ten Percent law was very weakly, positively correlated to Percent First-time, First-year African American (*Percftfyaa*) and moderately, positively correlated to Percent First-time, First-year Hispanic (*Percftfyh*). Percent of the state that identifies as Hispanic (*Percsth*) was strongly, positively correlated to the Top Ten Percent law. MSI (*Msi*) was moderately, positively correlated to Percent First-time, First-year African American and strongly, positively correlated to Percent First-time, First-year Hispanic. State (*St*) was moderately, positively correlated to Percent First-time, First-year Hispanic and weakly, negatively correlated to Percent First-time, First-year African American.

Table 6 presents triennial mean student enrollment each year by state (TX vs. CO, IL, NY, and NC) and dependent variable. Figures 1-3 graph these results. Figure 1 shows the graphic result for the combination of Percent First-time, First-year African

Table 6. Triennial Mean Student Enrollment by State and Dependent Variable

Year	Percent FTFY African American + Hispanic		Percent FTFY African American		Percent FTFY Hispanic	
	TX	CO, IL, NY, NC	TX	CO, IL, NY, NC	TX	CO, IL, NY, NC
1988	24.21	19.96	7.64	11.27	16.57	8.69
1992	29.69	22.99	7.99	12.34	21.71	10.65
1995	35.22	23.09	8.31	12.11	26.91	10.97
1998	37.89	22.53	9.79	11.71	28.10	10.82
2001	39.18	22.21	10.12	11.42	29.06	10.79
2004	41.24	21.84	11.06	10.77	30.18	11.07
2007	42.92	23.26	11.46	11.43	31.46	11.83

American + Hispanic (*Percftfyaah*). The mean enrollment rates for the other states in this study was relatively flat from 1988-2009. In Texas, Hispanic enrollment rates are definitely helping to drive up the enrollment levels for minority students.

Figure 2 presents the graphic results for the dependent variable Percent First-time, First-year African American (*Percftfyaa*). The mean enrollment rates for African American students in Texas have been increasing since 1993 and have exceeded the mean enrollment levels for the other institutions in the study since 2007. The combination of CO, IL, NY, and NC has seen a slight dip in enrollment rates for African American students across the years of the study. These results are somewhat surprising for the other states in the study since other research suggests that across the country, African American enrollment rates have statistically increased at non-flagship institutions (McGill, 2015).

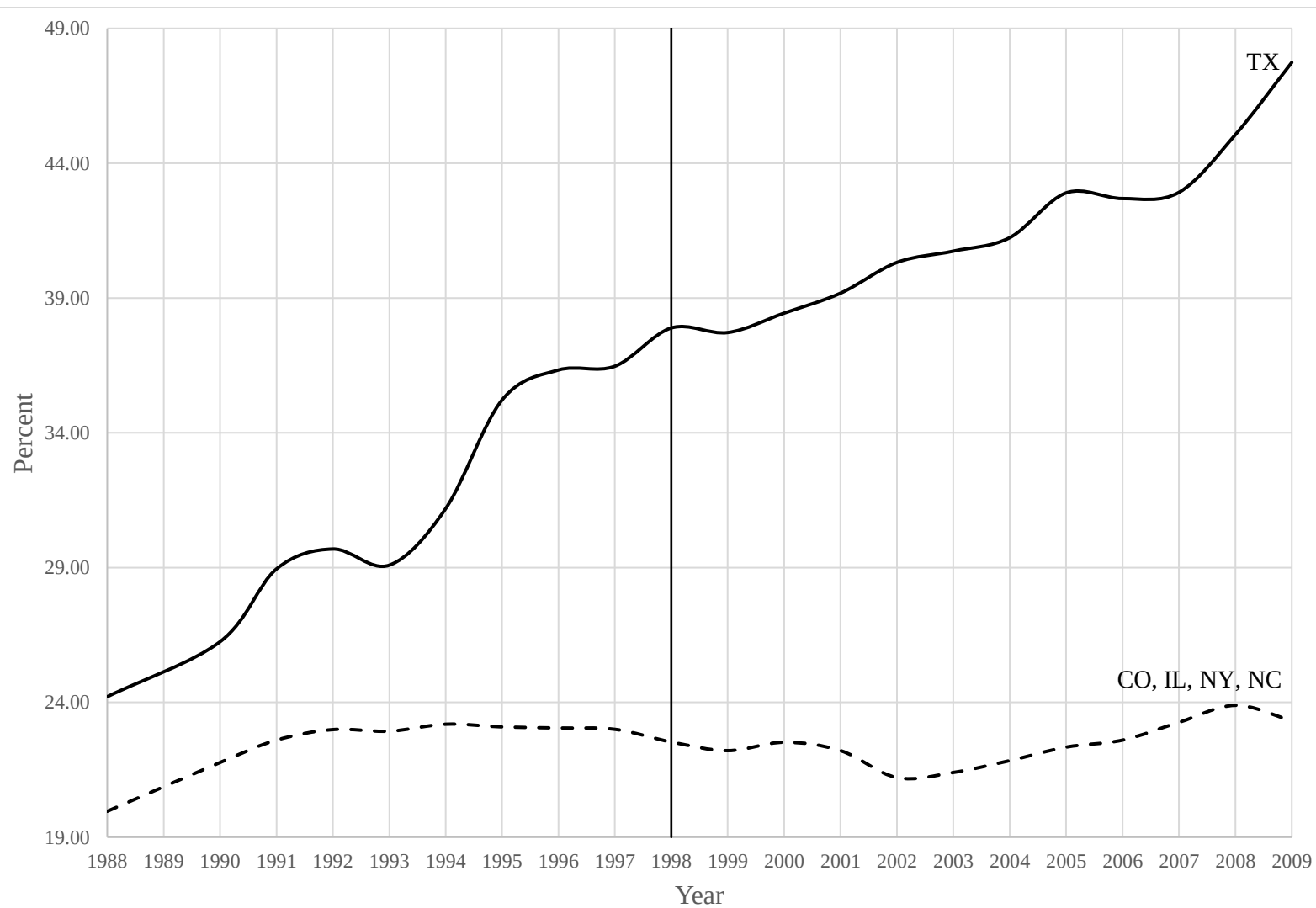


Figure 1. Mean Percent FTFY African American + Hispanic



Figure 2. Mean Percent FTFY African American

Figure 3 represents the graph for Percent First-time, First-year Hispanic (*Percftfyh*). Enrollment rates for Hispanic students in Texas have increased steadily since 1988, at a much greater rate than the other states in this study. The mean enrollment rates for CO, IL, NY, and NC have barely cracked the double-digits, while non-flagship institutions in Texas see mean enrollment rates over 30%. This is probably due in part to Texas being a border state to Mexico, with a large, young, and growing Hispanic population. By 2005, the Hispanic population in Texas made up 35% of the state population, with African Americans making up 11% of the state population (Peterson & Assanie, 2005). In 2001, the Texas legislature authorized the state DREAM Act, appropriating financial aid resources and granting in-state tuition rates to undocumented high school graduates, increasing the college-going rate of Hispanic students drastically. The other states in this study did not have state DREAM Acts with additional financial aid support during the scope of this study. Overall, the graphs reveal that while Texas has led in Hispanic student enrollment rates, it has lagged behind in enrollment rates for African American students.

Regression Models and Results

As stated in Chapter 3, the following hypotheses were tested:

Hypothesis 1: Public, non-flagship, four-year institutions in Texas will become more racially/ethnically diverse as a result of the Top Ten Percent law.

Hypothesis 2: Public, non-flagship, four-year institutions in Texas considered less selective (i.e. not labeled highly competitive, very

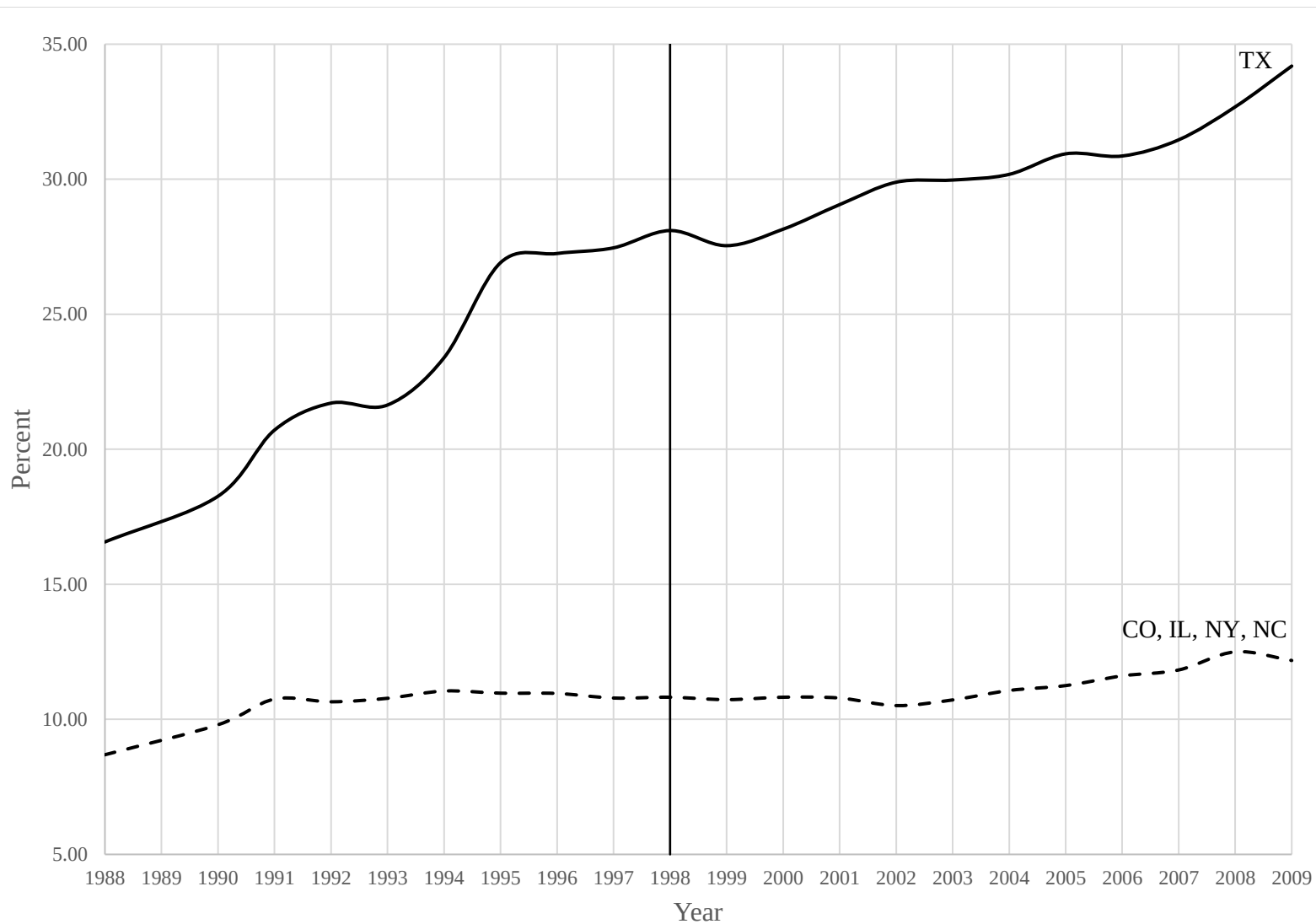


Figure 3. Mean Percent FTFY Hispanic

competitive, or competitive+) will become more racially/ethnically diverse after controlling for the implementation of the Top Ten Percent law.

Hypothesis 3: Public, non-flagship, four-year institutions in Texas located in urban or suburban areas will become more racially/ethnically diverse than those located in rural areas after controlling for the implementation of the Top Ten Percent law.

To that end three variations for each regression simulation were developed, which were explained in-depth in Chapter 3. To summarize, all tables present the results for both fixed and random effects. Model A accounts for the Top Ten Percent law (*Ttpl*), time (*Time*), and percent state population estimates (*Percstaah*, *Percstaa*, *Percsth*). Model B adds in control variables for total undergraduate enrollment in thousands (*Totugenrlk*) at an institution as well as percentage first-time, first-year female (*Percftfyf*). Model C controls for the monetary variables of tuition and fees (in thousands of dollars) (*Tfconk*) and financial aid (in millions of dollars) (*Aidconmil*), both in constant 2009 dollars. Finally, Model D adds in the dichotomous variables of selectivity (*Highsel*, *Medsel*), urbanicity (*Urb*), minority serving institution (*Msi*), and state (*St*) to control for fixed institutional characteristics.

To determine more accurate R^2 values, dummy variables were created to control for fixed effects for institutions and years. Then these new variables were added to the four model variations above and estimated in STATA using OLS and the REGRESS command (R. Toutkoushian, personal communication, June 9, 2016). The additional dichotomous variables in model 4 for each iteration were perfectly collinear to institutions, therefore those R^2 values are exactly the same as the R^2 values for model 3.

F-test p-values for all models were 0.0006 or smaller, meaning that the fit of each model is statistically significant and the variables used in this study are better than an intercept-only model (Frost, 2015).

Table 7 shows the various regression models for the Percent of First-Time, First-Year African American and Hispanic students. Based on the R^2 value, over 96 percent of the variation of the first-time, first-year combination of African American and Hispanic students was explained by the control variables. Across all models, the Top Ten Percent law was strongly significant to the $p < .001$ level. The law increased enrollment levels for the combination of first-time, first-year minority categories by over 4.5 percentage points, even after controlling for the natural increase in state population for this combined minority category (*Percstaah*). This finding supports Hypothesis 1. Surprisingly, time was not statistically significant in any of the models for this dependent variable simulation. Texas was not statistically different from the other comparison states based on the state variable (*St*) results.

More selective institutions (*Highsel*) saw a decrease of over 14 percentage points for African American and Hispanic first-time, first-year enrollment levels, significant at the $p < .05$ level. This suggests that underrepresented minority students chose not to enroll in the most selective institutions used in this study, which lends some support to Hypothesis 2, enough to fail to reject the hypothesis. Minority enrollment levels also increased by 14.1 percentage points, significant to the $p < .05$ level, at more urban-located institutions. Overall, this finding supports Hypothesis 3.

The percent of first-time, first-year enrolled students that were female increased by nearly .2 percentage points ($p < .05$) when African American and Hispanic enrollments

Table 7: Regression Model Simulations of Percent First-Time First-Year African-American + Hispanic

	(1) FE1	(2) RE1	(3) FE2	(4) RE2	(5) FE3	(6) RE3	(7) FE4	(8) RE4
Top 10% Law	4.975*** (0.989)	4.969*** (0.989)	4.927*** (0.970)	4.924*** (0.969)	4.525*** (0.990)	4.510*** (0.987)	4.525*** (0.990)	4.511*** (0.990)
Time	0.028 (0.065)	0.026 (0.064)	0.045 (0.066)	0.045 (0.066)	-0.118 (0.082)	-0.116 (0.082)	-0.118 (0.082)	-0.115 (0.083)
% State Pop AA+H	0.225*** (0.065)	0.232*** (0.064)	0.211** (0.063)	0.218*** (0.062)	0.158** (0.051)	0.172*** (0.051)	0.158** (0.051)	0.162** (0.051)
Total UG			-0.087 (0.202)	-0.100 (0.194)	-0.088 (0.320)	-0.133 (0.307)	-0.088 (0.320)	-0.143 (0.307)
% FTFY Female			0.186 (0.113)	0.193+ (0.111)	0.206+ (0.109)	0.214* (0.107)	0.206+ (0.109)	0.215* (0.107)
Tuition/Fees					1.200** (0.394)	1.143** (0.390)	1.200** (0.394)	1.172** (0.392)
Financial Aid					-0.014 (0.051)	-0.006 (0.050)	-0.014 (0.051)	-0.008 (0.050)
High Selectivity							omitted	-14.377* (7.215)
Medium Selectivity							omitted	-9.286 (6.088)
Urbanicity							omitted	14.131* (5.487)
MSI no HBCU							omitted	32.424*** (5.863)
State							omitted	-0.718 (5.253)
N	1729	1729	1729	1729	1729	1729	1729	1729
r2	0.9687		0.9700		0.9709		0.9709	

Standard errors in parentheses; + p<.10, * p<.05, ** p<.01, *** p<.001

were combined and more control variables were added. This suggests that over time more minority women started to enroll in college. A tuition and fees increase of \$1000 increased the combination enrollment level by at least 1.1 percentage points, significant at $p < .01$. Enrollment levels at minority serving institutions saw an increase of 32 percentage points over all time periods, strongly significant at $p < .001$.

Table 8 shows the results for the four regression models for the dependent variable Percent of First-Time, First-Year Students who are African American. The R^2 value means that up to 92.74 percent of the variation in the percent of first-time, first-year African American students who enroll in college is explained by the control variables. The results suggest that the Top Ten Percent law had a marginally significant effect of nearly 3 percentage points, to the $p < .001$ level. Controlling for the change in population for African Americans resulted in an almost .2 percentage point increase in enrollment rates, significant to the $p < .01$ level.

The time variable becomes significant ($p < .10$) in models C and D and are negative results. This means there was a slight downward trend over time for African American first-time, first-year enrollment rates across all institutions in the study but the Top Ten Percent law was able to increase enrollment rates in Texas for African American first-time, first-year students. This is corroborated by the results in model D for the state variable (St) and Figure 1. The state variable explains that Texas in particular had a 6.6 percentage point uniform downward trend for African American first-time, first-year student enrollment rates over the years of the study, when compared to Colorado, Illinois, New York, and North Carolina. The Top Ten Percent law reduced that downward trend by almost 3 percentage points. These results support Hypothesis 1.

Table 8: Regression Model Simulations of Percent First-Time First-Year African-American

	(1) FE1	(2) RE1	(3) FE2	(4) RE2	(5) FE3	(6) RE3	(7) FE4	(8) RE4
Top 10% Law	3.232*** (0.748)	3.212*** (0.747)	3.245*** (0.728)	3.226*** (0.726)	2.951*** (0.686)	2.930*** (0.684)	2.951*** (0.686)	2.940*** (0.686)
Time	-0.024 (0.047)	-0.021 (0.046)	-0.000 (0.050)	0.003 (0.050)	-0.106+ (0.057)	-0.101+ (0.057)	-0.106+ (0.057)	-0.101+ (0.058)
% State Pop AA	0.257** (0.084)	0.276*** (0.083)	0.266** (0.083)	0.286*** (0.082)	0.193** (0.068)	0.217** (0.068)	0.193** (0.068)	0.217** (0.068)
Total UG			-0.207 (0.186)	-0.218 (0.182)	-0.226 (0.247)	-0.249 (0.240)	-0.226 (0.247)	-0.250 (0.240)
% FTFY Female			0.104 (0.073)	0.110 (0.071)	0.114 (0.071)	0.120+ (0.070)	0.114 (0.071)	0.119+ (0.071)
Tuition/Fees					0.658* (0.298)	0.633* (0.296)	0.658* (0.298)	0.637* (0.297)
Financial Aid					-0.003 (0.037)	0.000 (0.037)	-0.003 (0.037)	-0.000 (0.037)
High Selectivity							omitted	-14.214+ (7.602)
Medium Selectivity							omitted	-6.850 (6.304)
Urbanicity							omitted	11.838* (5.662)
MSI no HBCU							omitted	-6.758 (6.269)
State							omitted	-6.601 (5.593)
N	1729	1729	1729	1729	1729	1729	1729	1729
r ²	0.9226		0.9256		0.9274		0.9274	

Standard errors in parentheses; + p<.10, * p<.05, ** p<.01, *** p<.001

Selectivity level of the institution had a statistically significant impact on the percent of first-time, first-year African American students that enrolled in an institution. African American first-time, first-year students were 14 percent less likely to enroll in highly selective (*Highsel*) institutions, significant at the $p < .10$ level. This results support Hypothesis 2. The urbanicity of the location of an institution was significant in this simulation as well. African American students were 11.8 percentage points more likely to enroll in urban or suburban located institutions, significant to the $p < .05$ level. This result supports Hypothesis 3. Together, these results suggest that African American students may take the selectiveness or location of an institution into account when deciding where to enroll for a higher education experience.

Table 8 also suggests that for every \$1000 increase in tuition and fees, the enrollment rate for first-time, first-year minority students increased .633-.658 percentage points, significant to the $p < .05$ level. Minority serving institutions did not have any statistically significant results in this simulation, suggesting that African American students do not necessarily attend minority serving institutions that are not HBCUs. This is not surprising since HBCUs were originally founded for African American students and have a long educational history in this country.

Table 9 shows the various regression models for the dependent variable Percent First-Time, First-Year Hispanic students. The R^2 value for all control variables explains that 98.46 percent of the variation was being explained with simulation 3. For all regression models, the Top Ten Percent law (*Ttpl*) is statistically significant to at least the $p < .01$ level, resulting in an increase of enrollment of nearly 2 percentage points for Hispanic first-time, first-year students in Texas. Enrollment rates for first-time, first-year

Table 9: Regression Model Simulations of Percent First-Time First-Year Hispanic

	(1) FE1	(2) RE1	(3) FE2	(4) RE2	(5) FE3	(6) RE3	(7) FE4	(8) RE4
Top 10% Law	2.252*** (0.618)	2.268*** (0.618)	2.149*** (0.626)	2.165*** (0.625)	1.923** (0.650)	1.945** (0.649)	1.923** (0.650)	1.922** (0.650)
Time	0.116*** (0.027)	0.112*** (0.027)	0.109*** (0.027)	0.105*** (0.026)	0.036 (0.043)	0.034 (0.043)	0.036 (0.043)	0.037 (0.043)
% State Pop H	0.018+ (0.010)	0.028* (0.011)	0.013 (0.009)	0.023* (0.010)	0.013 (0.009)	0.025* (0.010)	0.013 (0.009)	0.017+ (0.009)
Total UG			0.127 (0.158)	0.127 (0.153)	0.141 (0.185)	0.131 (0.178)	0.141 (0.185)	0.112 (0.173)
% FTFY Female			0.090 (0.059)	0.088 (0.058)	0.098+ (0.057)	0.095+ (0.056)	0.098+ (0.057)	0.096+ (0.055)
Tuition/Fees					0.527** (0.185)	0.500** (0.184)	0.527** (0.185)	0.517** (0.183)
Financial Aid					-0.010 (0.033)	-0.007 (0.033)	-0.010 (0.033)	-0.008 (0.032)
High Selectivity							omitted	-0.112 (2.423)
Medium Selectivity							omitted	-2.742 (2.313)
Urbanicity							omitted	2.097 (1.798)
MSI no HBCU							omitted	39.316*** (5.138)
State							omitted	8.498** (2.661)
N	1729	1729	1729	1729	1729	1729	1729	1729
r ²	0.9846		0.9849		0.9851		0.9851	

Standard errors in parentheses; + p<.10, * p<.05, ** p<.01, *** p<.001

Hispanic students were part of a near 8.5 percentage point upward trend ($p < .01$) in Texas than the other states in the study over all time periods, based on the state variable (*St*). This means that the uniform upward shift was then bumped up even more with the introduction of the Top Ten Percent law in Texas. Texas has had an increasing Hispanic population for many years and is now considered a minority-majority state, so this result is not that surprising. These results support Hypothesis 1.

Neither selectivity level variable was statistically significant for this dependent variable. Therefore, Hypothesis 2 is not supported. An urban or suburban location of the institution also did not result in statistically significant increases in enrollment for Hispanic first-time, first-year students. Therefore, Hypothesis 3 is rejected in this simulation 3. Hispanic first-time, first-year students therefore seem less interested in the selectivity level and location of an institution when compared to African American students.

The designation of being a minority serving institution was significant to the $p < .01$ level, resulting in a 39 percentage point increase in enrollment levels. This suggests that Hispanic students may be starting to seek out these types of institutions more often. The history for Hispanic serving institutions is much more recent, with Congress giving that designation starting in 1992.

In Texas, the vast majority of the minority serving institutions used in this study are located in cities where a majority of the population considers themselves Hispanic. Both located on the border with Mexico, UT-El Paso is 80.7% Hispanic while Texas A&M International University in Laredo is 95.6 % Hispanic. Further north into the state, TAMU-Kingsville is 72.4% Hispanic and UT-Pan American in Edinburg is 88.7%

Hispanic. Outside of Texas, the Hispanic population numbers are not as strong but they are growing. New York City, where several CUNY institutions are identified as minority serving, is now 28.6% Hispanic. Similarly, Chicago, where Northeastern Illinois State University resides, is now 28.9% Hispanic. Therefore, it is very likely that the MSIs in Texas are different from the MSIs in the other states in this study and the Texas MSIs are driving the results in Table 9.

Time was strongly significant to the $p < .001$ level until the monetary and fixed institutional characteristics were added to the simulation in models C and D. This table also suggests that a \$1000 increase in tuition and fees results in a .5 percentage point increase in enrollment for Hispanic first-time, first-year students. The control for the percentage of the state population that identifies as Hispanic was mainly significant in the random effects versions of each model. The increases in the percentage of students enrolling as a result of natural population change was small, barely .02 percentage points.

Overall, the Top Ten Percent law results from Table 7 were supported by the individual minority results from Tables 8 and 9. The statistically significant selectivity results from Table 7 were interesting since the specific minority level data in Table 8 was only significant to the $p < .10$ level and in Table 9 were not significant for this variable. The minority serving institution data from Table 7 seems to be mostly driven by African American enrollment rates when viewed with Tables 8 and 9.

When viewed as a whole, shown in Table 10, all the dependent variables saw statistically significant, positive results for the Top Ten Percent law variable when controlling for all variables in the study (model D). The Top Ten Percent law variable was not very sensitive to changes in the models. These results are strong evidence that

Table 10. Hypotheses Summary

Dependent Variable	Hypothesis 1: Overall?	Hypothesis 2: Selectivity	Hypothesis 3: Location
Percent FTFY AA + H (Simulation 1)	Fail to Reject***	Fail to Reject*	Fail to Reject*
Percent FTFY African American (Simulation 2)	Fail to Reject***	Fail to Reject+	Fail to Reject*
Percent FTFY Hispanic (Simulation 3)	Fail to Reject**	Reject	Reject
Overall	Fail to Reject	Fail to Reject	Fail to Reject

Note: star levels relate to * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. FTFY stands for first-time, first-year. AA stands for African American. H stands for Hispanic.

the Top Ten Percent law has increased minority enrollment levels at non-flagship, four-year institutions in Texas as a whole, in concurrence with failing to reject Hypothesis 1.

The high selectivity variable (*Higsel*) produced statistically significant results for the dependent variables *Percftfyaah* and *Percftfyaa* in the study (simulations 1 and 2). The results were negative, and the direction of the variable suggests that less selective institutions have seen increases in enrollment rates for minority students. There is weak evidence to support the failure to reject Hypothesis 2.

The location of an institution does seem to matter to African American minority students, when looked at across simulations 1 and 2. Being located in an urban or suburban area leads to a statistically significant increase in minority enrollment levels at non-flagship institutions across the combination minority category dependent variable of Percent FTFY African American and Hispanic and the individual minority category of Percent FTFY African American. The results are not statistically significant in

simulation 3 using only Hispanic students, but overall Hypothesis 3 can be accepted across all models due to the significance (at least $p < .05$) of the combined minority categories, which include more students.

All R^2 values were greater than .92, explaining a lot of the variability of this study. The F-test p-values indicate this model is a good fit. Accounting for the remaining 8% of the variance could be difficult. However, since this study used variables identified in many other studies, the results do seem to be significant.

Summary

In this chapter the results of the panel data regression models were presented. The majority of the correlations were expected. The random effects models were able to give better estimates in model D of each simulation due to the dichotomous nature of the variables added to control for fixed characteristics of institutions. The various simulations found evidence of support for all three hypotheses. African American students in Texas have recently exceeded the enrollment levels at non-flagship, four-year institutions of students in Colorado, Illinois, New York, and North Carolina combined. Conversely, Hispanic students have enrolled at much higher rates in Texas than the mentioned comparison states. Either way, the Top Ten Percent law has increased minority enrollment rates at public, non-flagship, four-year institutions in Texas. The final chapter will discuss the implications of these results.

CHAPTER 5

CONCLUSION

The final chapter begins with a review of the study conducted in the previous chapter, discussing the results of the various models and simulations. Next, the results are reframed based on the literature presented in chapter 2 on the specific hypotheses of this study, access and choice, organizational characteristics, and affirmative action. Following this, the implications for future research on the Top Ten Percent law are discussed. Finally, suggestions for future policy regarding affirmative action, and race-neutral admissions policies are introduced.

Review of the Study

This study was motivated by my interest in a policy that impacted my college-going personally, as well as a lack of studies regarding the impact of the Top Ten Percent law across the entire state of Texas. Since the *Fisher* Supreme Court cases started making headlines in 2012, this topic has become even more important. As stated previously in Chapter 2, there has been a lack of research using all non-flagship institutions in Texas and focusing solely on the implementation of the Top Ten Percent law, as opposed to *Hopwood* or other policy interventions.

The results from chapter 4 point out several issues. Texas had lagged behind other states in regards to African American enrollment rates, but the gap has closed since 2003. Over the course of this study, Texas was in the midst of a downward enrollment shift of over 6 percentage points for first-time, first-year African American students at

public, non-flagship, four-year institutions when compared to Colorado, Illinois, New York, and North Carolina (Table 8). On average, enrollment rates have increased since 1993 for first-time, first-year African American students at public, non-flagship institutions in Texas. Over the same time period Colorado, Illinois, New York, and North Carolina have seen somewhat stagnant mean enrollment rates for first-time, first-year African American students at public, non-flagship institutions. (Figure 2). The boost from the enactment of the Top Ten Percent law of nearly 3 percentage points has helped to close the gap between Texas and its counterparts in this study (Hypothesis 1).

Encouragingly, Texas has done a better job with enrolling Hispanic students into institutions of higher education, especially when compared to the relatively flat enrollment rates from the other states in this study. Texas non-flagship institutions enjoyed a statistically significant 8 percentage point upward enrollment shift during the course of this study over similar institutions in Colorado, Illinois, New York, and North Carolina. The addition of the Top Ten Percent law adds another 2 percentage points to the enrollment rates for first-time, first-year Hispanic students in Texas, helping to boost an already growing segment of the college-going population (Hypothesis 1).

The results from Table 6 suggest that the non-flagship, four-year institutions in Texas, on average, are better keeping pace with the demographics of the state. According to the 2010 Census, Texas was 45.3% White, 37.6% Hispanic, and 11.8 % African American (U.S. Census Bureau, 2011a). The mean enrollment levels for the first-time, first-year students at non-flagship institutions in Texas in 2009 used in this study was 47.82% White, 34.19% Hispanic, and 13.59% African American. If the goal of racial diversity, as some suggest, is to represent the demographics of a state, these results are

not too far off the mark. If Gurin et al. (2002) are correct in their assumptions, then students at non-flagship, four-year institutions are gaining positive educational outcomes as a result of the diversity in their classrooms.

This study did find some statistically significant findings with regards to the selectivity level of an institution (Hypothesis 2). According to the results in Tables 8 and 9, African American students are more likely than Hispanic students to choose to enroll in less selective institutions. The impact of choosing away from highly selective institutions was over 14 percentage points for African American students. Since flagship institutions do not exist in this dataset and these students did enroll somewhere, the negative finding suggests that African American students in particular were choosing to enroll in less selective institutions. This may be in part due to students choosing to enroll in alternative admissions programs through the University of Texas or the Texas A&M University systems. Melguizo (2008) found that minority students especially benefit from attending more selective institutions, so this finding for African American students is concerning. Bowen and Bok (1998) also noted that as the quality of the institution rises, so does the graduation rate. Therefore, minority students benefit in terms of greater return on investment by a.) being more likely to graduate from more selective institutions and b.) being able to reap the rewards that come from a college degree, both economically and personally.

Also, while the college-going gap may have decreased, the completion gap has not diminished. As of 2004, which is towards the end of the length of my current study, there was still a 20% gap between the graduation rates of Whites and African Americans and Whites and Hispanics (Carey, 2004). When a student is unable to complete the

requirements for a college degree, not only do they suffer economic impacts, but also personal ones regarding self-worth and self-efficacy. This in turn can trickle down from generation to generation, perpetuating an already vicious cycle of under-enrollment for minority students at more selective institutions.

The selectivity results from Tables 7 and 8 also support the study by Hicklin (2007) that found that minority students redistributed to less selective institutions under *Hopwood* and Prop 209. Long and Tienda (2010) surmised that this trend continued when applicants knew that the Top Ten Percent law was in effect, and those students not in the top decile changed their application patterns and did not try to attend the most selective institutions. Ironically, this had been the case for years as the most selective institutions in the state had predominantly admitted students in the top ten percent long before it became law, students just did not know it. Dickerson and Jacobs (2006) and Thomas (2004) suggest that since the imposition of affirmative action policies in the 1990s, minority students have shifted towards less selective (i.e. non-flagship) institutions due to the limitations (perceived and real) of equal access, which my study supports to some degree.

In this study, Texas A&M-Galveston, Texas State University, Texas Tech University and UT-Dallas are considered highly selective. Over the 21 years of this study, the first-time, first-year enrollment levels for African American and Hispanic minority students have only risen approximately 5 percentage points for the first three institutions and actually dropped at UT-Dallas. The majority of this combination enrollment data comes from Hispanic student enrollments as opposed to African American enrollments. Texas A&M-Galveston has gone from 12.08-17.72% combined

African American and Hispanic enrollment levels. Texas State University has the best combined minority rates from 27.59% to 31.51%. Texas Tech University has gone from 13.79-19.71% African Americans and Hispanics enrolled. UT-Dallas has seen a drop in the enrollment of African American and Hispanic first-time, first-year students from 16.98% to 14.95%. These results should be especially concerning for Texas Tech University and UT-Dallas, since both institutions are vying to earn Tier 1 status in Texas. Texas Tech has already met the threshold for accessing state funds to continue the challenge for upgraded status and UT-Dallas has already met three of the minimum of four requirements needed to access the additional funds.

This study did find some support for the location of an institution being important, especially when looking at first-time, first-year minority enrollment rates more broadly (Hypothesis 3). As with the selectivity variable, African American students seem to be driving the results. This concurs with the findings by Long et al. (2010) that more urban-located institutions attract more minority applicants and ties in to the research by Hillman and Weichman (2016) stating that students attend college within 50 miles of home. Franklin (2013) found that the demographic make-up of the college-going population surrounding an institution matters greatly. Institutions located in urban and suburban areas are more likely then to draw from a diverse pool of applicants, helping to maintain their racial diversity.

Interestingly, Tables 7, 8, and 9 show that for this data set, a \$1000 increase in tuition and fees slightly increased enrollment rates for minority students across the board. For African American students (*Percftfyaa*), the results were significant to the $p < .05$ level and for Hispanic students (*Percftfyh*) as well as the combination of minority groups

(*Percftfyah*) the results were significant to the $p < .01$ level. These results contradict the research by Leslie & Brinkman (1987), Heller (1997), and Engberg & Wolniak (2009) who found that minority and low-income students are especially sensitive to tuition increases.

It is possible that there are financial aid programs in place in the five states used in this study that are targeted toward minority students to help offset increases in educational costs. The use of the state-level DREAM Acts in Texas and New York could also be making it more affordable for undocumented Hispanic students to attend college due to the in-state tuition rates that goes with it, thereby skewing my results in an upward and positive direction. Another reason for this result could be the ease of gaining better college-choice data with the proliferation of the internet, especially since 2000. College price tags have become even more visible and easy to understand, helping families better plan for college and understand the investment they are making. Therefore, minority students may be less sensitive to tuition increases now than they were previously, which my study suggests. However, there is currently no other literature supporting these results. Further investigation on this portion of the study is necessitated.

My results partially contradict Perna's 2006 findings regarding access and choice. In Texas, Hispanic students are attending four-year, non-flagship institutions at a greater rate than Hispanic students in Colorado, Illinois, New York, and North Carolina. Hispanic students are also attending four-year, non-flagship institutions at a much greater rate than African American students. So while Perna's findings regarding Hispanic students are not supported here, it may be that in Texas in particular, African American

students are either enrolling more often at two-year institutions or flagship institutions, which is outside the scope of this study.

Minority students may choose to attend MSIs because they often have a mission of accessibility and are more likely to keep tuition prices low (Dill, 1997). Therefore, families that are navigating the college choice process for the first time are better able to plan for how much an experience might cost. Institutions with a more collegial feel may feel like a better “fit” for minority students who can see themselves attending, especially when the student body looks like them, as it might at an MSI (Birnbaum, 1988). MSIs are often smaller, so there’s more chance for a minority student to feel accepted (Mercer & Stedman, 2004).

The results of my study are particularly interesting, especially for Hispanic students, when affirmative action is taken into account. The Texas institutions do not use race in admissions while the other states in the study can use race to craft a diverse incoming freshman class. Colorado, Illinois, New York, and North Carolina have not admitted Hispanic students to their non-flagship institutions at the same rates as non-flagship institutions in Texas, according to my results in Table 9. This could be due in part to the DREAM Act in Texas that allows not only for in-state tuition for undocumented Hispanic students but also allocates state-level financial aid opportunities as well. However, Hispanics are currently the largest minority group in the United States according to the most recent Census data, so other states should continue to work on increasing enrollment levels. African American student enrollment numbers in Texas may have been hampered by race-neutral admissions policies (Table 8), but the mean

enrollment numbers for non-flagship institutions are still not that far off from the total percentage of African Americans living in the state.

Implications for Future Research

This study has several implications for future research. Additional variables for inclusion such as *Hopwood*, flagships, and Asian American student enrollment data could help the generalizability of these results to Texas. Being able to fine-tune the enrollment data by using exact Top Ten Percent law enrollment numbers, in-state only enrollment data, and application and graduation rates, as well as the state population variables, would also be useful and help gain additional insights into college-going patterns in Texas.

Future versions of this study should look at adding in *Hopwood* as a variable for study. While that court decision was only enacted for one year of incoming freshman (1997), prior research has suggested that it damaged the racial composition of institutions in Texas (Chapa & Lazaro, 1998; Tienda et al., 2003; Harris & Tienda, 2010). It was omitted from this study because Tienda et al. (2003) stated that only the flagship institutions reported using race in admissions prior to the court case. As discussed earlier in this chapter, the *Hopwood* decision definitely could have been a contributing factor to the declining enrollment rate for African American students in higher education in Texas. Although, on the mean, public, non-flagship, four-year institutions in Texas hit the lowest enrollment point for African American students in 1993, long before the *Hopwood* case was finalized. High school graduation rates for minority populations could also be added to the study to help understand trends in each state being studied. Also, adding in flagship institutions could help to highlight the enrollment patterns that are occurring across each state more clearly.

The inclusion of Asian American students needs to be addressed in future versions of this study as well. While not studied here, Asian American students are likely a large contributing factor to the overall upward trend of minority enrollment levels for first-time, first-year students, both in Texas and the other states in this study. Some of the difficulty with including Asian American students in studies is the broad range of the definition of Asian. Do students from Cambodian descent act differently throughout the college choice process than do students from Japanese descent? Teranishi (2012) suggests that there is a broad range of sub-categories for students that identify as Asian American or Pacific Islander and those from East and South Asia (ex. China, Japan, and Korea) graduate college at much higher rates than those from Southeast Asia or the Pacific Islands (ex. Laos, Samoa, and Vietnam). Perhaps it does not matter, since much current educational research uses the broad category of Hispanic or Latino to define the wide range of students from Central and South America with seemingly little problem. The inclusion of Asian American students in a study of this type could go a long way to helping to reduce bias based upon the stereotype in the United States that “all Asians are smart” and therefore not problematic and undeserving of additional study (Teranishi et al., 2004). Whether or not that broad generalization is true, research is needed to determine how *all* students navigate the college choice, application, and enrollment process as well as how they fare once they are attending college.

As previously mentioned in this chapter, it is also worth noting that some students enroll in less selective institutions as the result of alternative admission programs. UT-Austin has UT-CAP (Coordinated Admission Program) and Texas A&M uses PSA (Program for System Admission). As more students were admitted to the freshman class

via the Top Ten Percent law, the flagship campuses looked for ways to indirectly admit deserving students. Both programs allow students to enroll at specified non-flagship system schools and upon meeting program requirements during their freshman year to transfer into particular colleges or degree plans at each flagship campus. This could be artificially inflating the first-time, first-year data reported for non-flagship institutions in the Texas flagship systems. It definitely hurts retention levels for the receiving system school when those students leave after a year. From my personal experience administering one of these programs, the non-flagship campus tries to retain those students as much as possible. While neither campus wants to divulge these types of enrollment numbers, future research should look at enrollment trends by race of these students to see if more underrepresented minority students are being offered alternative admissions when compared to White students. If so, this could be a troubling side effect to these types of programs.

There are some additional variables that could be interesting to explore including exact high school rank and top ten percent enrollment numbers. A difficulty with high school rank data is that most of the data available publicly is at the institutional level, not the individual level. Enrollment numbers in this study include all first-time, first-year students, including out-of-state and international enrollees, not just those admitted under the Top Ten Percent law. As for an accounting of the number of students admitted under the Top Ten Percent law, this data seems to be limited to students at certain, heavily studied institutions (i.e. flagship universities). It may be possible to request this data from each individual institution since this research is not ultimately interested in student level data, but the aggregate.

An additional extension would be to see if the racial diversity for each campus in the study was being impacted just by in-state students or possibly by an influx of out-of-state students. Jaquette and Curs (2015) suggest that as state appropriations declined in the 2000s, officials at public institutions attempted to enroll more out-of-state students to gain increased tuition revenue. This change in focus could have pushed out deserving, lower-ranked, in-state students from enrolling and therefore negatively skewed the racial and socioeconomic diversity of institutions in the study.

This research could also be extended with the inclusion of application numbers, acceptance rates, yield, retention, and graduation rates. This study only looks at the students that enrolled for their first year. A logical next step would be to look first at application patterns and then at the persistence and graduation rates of students at non-flagship, four-year institutions. That information could then be tied to migration patterns to see if these newly educated graduates stay in-state to contribute to the Texas economy or take their talents elsewhere.

Finally, the state population change variables could be more finely tuned if data for the 18-24 age group could be accessed for all years of the study. While having overall population change for each minority group is useful for broad trends, being able to see the changes in the college-age-going population for each state would enhance the study even further.

Recommendations and Implications for Future Policy

There are several recommendations to be made based on this new research. As mentioned by Kao & Tienda (1998), the educational aspirations of African American and Hispanic students are often lower than their White counterparts. At the federal level, the

government could do more to increase the educational quality level of low-resource high schools by granting additional funds for campus needs as well as helping to start to increase the difficulty level of classes needed to be more prepared for college. At the state level, more money could be granted to teacher education programs to help ensure that all graduates going into teaching or counseling roles in high schools are well-prepared and committed to the job, not just wanting summers off. Institutions of higher education need to continue to build ties to low-resource neighborhoods and high schools to help educate first-generation families about how to navigate the college choice process and help increase the college-going rates of minority students (Hossler & Gallagher, 1987).

Often a region or state benefits economically by having institutions with a diverse student body, such as non-flagships (Franklin, 2013). The baby boomer portion of the population of the State of Texas has started to retire and will continue to do some for several more years. An educated workforce will be needed to fill those positions and non-flagship, four-year institutions can help meet the needs of employers today by helping students earn some type of degree.

Several alternatives have been proposed that could help admissions officers continue to shape diverse classes of incoming freshman without relying on race directly. In the past, traditional affirmative action enrollment plans gave a disproportionate boost to upper-middle-class and middle-class applicants of color (Greytak, 2014). One alternative option plan could be to give a boost to Top Ten Percent law enrollees using factors such as class or SES. Carnevale, Rose, & Strohl (2014) found that at 193 top institutions, applying a race-blind admissions policy using a combination of percent plan

and a boost for low-SES factors could give a cohort a more diverse look. Gaertner and Hart (2013) also suggest using class-based variables as a proxy for race since class status often goes hand-in-hand with racial diversity. These types of variables could help an admissions official at an institution continue to maintain a racially diverse campus under a race-neutral plan.

Allen (2014) suggests using ZIP-code data to mine into the lives of potential students. The U.S. government collects lots of data from residents, such as SES, age, racial breakdown, and population density. That data could then be used as part of a ranking system to target admissions offers to students from underrepresented and/or highly diverse ZIP-codes. A program like this would be very similar to the Top Ten Percent law which tries to reward students from highly segregated and underserved high schools. Cashin (2014) notes that people who live outside of advantaged neighborhoods have to work much harder to access the resources needed to gain admission to college. This type of targeted approach could also work well with the awarding of need-based financial aid packages as well.

Financial aid issues should also be addressed. The DREAM Act has helped make college a reality for many undocumented Hispanic students in Texas. This program should continue to be funded to assist with the needs of those students. Targeted financial aid programs for documented Hispanic students as well as African American students should also be added to increase diversity and give educational opportunities to low-SES students. However, it was encouraging that my study found that minority students were not as sensitive to tuition increases as previous research suggested.

Students from low-resource high schools that graduate in the Top Ten Percent can sometimes find themselves academically underprepared for college (Furstenberg, 2010). Knowing that tuition and fees were provided for with generous financial aid packages could allow students that would normally have to work at least part-time to pay for college to be able to free up time to use additional campus resources such as tutoring and supplemental instruction. This could be a mixture of both need- and merit-based aid, targeted toward upper-decile, low-income students.

There are a few implications for future policy. In Texas, while the vast majority of institutions do not use race currently in the admissions process, there is still work to be done to increase the racial diversity on college campuses. Between 1994 and 2004, post-secondary enrollment only rose 27% while the high school graduation rate rose 50% during that same time period, with Hispanics being "...the fastest-growing segment of the State's college-age population" (Harris & Tienda, 2012, p. 59). This current study does suggest that Hispanic students are enrolling at institutions in Texas at a higher rate than the other states examined. The THECB is pushing to have 60% of young adults (25-34 years old) in the state hold college degrees by 2030, dubbed 60x30TX (Smith, 2015). The minority population has continued to increase and the 2010 officially declared Texas as a minority-majority state (Tienda & Sullivan, 2010).

Non-flagship institutions in Texas should continue to offer lower-cost, quality degrees to help meet this future need of educated employees. They fill a need for students that may be bound to a particular location, whatever the reason. However, flagship institutions need to ensure that they are also doing their part to help minority students earn four-year degrees. The benefits that minority students receive from earning

a degree from a highly selective institution are manifold and were discussed in-depth in previous chapters. Flagship institutions should continue to push to increase diversity on their campuses and help ease financial burdens by offering targeted financial aid packages to monetarily-needy and academically-promising students.

Students that fall outside of the Top Ten Percent law, and particularly those students in the lowest deciles, may choose to start their educational journey at a community college in the state, then transfer to a four-year institution once they earn an associate's degree. That being said, even an associate's degree is better than no higher education at all, but minority students tend to earn these lower types of degrees at a greater rate than White college enrollees (Carey, 2004). Flagship and non-flagship institutions alike should continue to work on solidifying articulation agreements with community colleges in and around their location to make it easier for students to persist past a two-year degree and gain additional benefits.

For now, the use of race in admissions decisions is still legal under the latest Supreme Court ruling, *Fisher II*. However, in his dissent, Justice Alito brings forth some strong arguments. I can very easily envision additional challenges to the Equal Protection Clause in general, and UT Austin's admissions procedure specifically. Justice Alito notes that for the 2016 *Fisher II* challenge in particular, there were only 3 years of data using race-conscious admissions at UT Austin. Now, there is over a decade's worth of admissions data to be analyzed. He also remarks that during the "holistic" review, race is the only factor that is prominently featured on every page of the admissions process. If the use of race in admissions is struck down in the future, non-flagship institutions in Texas would gain more higher decile students as the carrying capacity of

flagship institutions became overwhelmed. Leaders at non-flagship institutions should start making contingency plans now to avoid last-minute scrambling.

Additionally, the exemption UT Austin was granted for their admissions has become a moving target. In Fall 2015, the president of UT Austin announced that the institution will only automatically admit students in the top 7% of their graduating class for the Fall 2017 incoming class (Watkins, 2015). Previously the target was 8%. This uncertainty each year makes it difficult for students to know if and when they will have automatic admission under the state law to UT Austin. Also, it gives students little time to make any changes to their high school GPA. Applications for Fall 2017 are due in early December 2016. Fall grades will not post or be calculated into overall class ranks until after this deadline. A student that was ranked at the 7.5% level and thought they were going to be automatically admitted to UT Austin will now have to apply to additional institutions, including out-of-state and non-flagships in Texas, to help ensure a college spot in Fall 2017. This can cost additional money, stress, and resources. A non-flagship institution could become a more viable alternative for this type of student with an admissions guarantee. Using both of the examples above, a rejected, highly qualified first-decile UT Austin applicant could make a compelling argument and challenge the fairness of this exemption when all other public, four-year institutions in Texas are able to abide by the law.

More needs to be done, and quickly, while also addressing the need to ensure that secondary education in the state is not lacking so students are prepared for post-secondary education experiences. One thing is certain: if the carrying capacity of the states' colleges and universities does not keep up with rapidly growing population, Texas

will fall behind the country not only educationally but economically as well. This study implies that less selective four-year colleges and universities need to continue to pick up the educational slack, but are making a positive impact on minority college enrollment rates in Texas, due in part to the Top Ten Percent law.

Summary

In closing, this paper builds on the existing literature in several ways. First, the issues of affirmative action and race-neutral admission plans are examined during a time of considerable interest in the topic via two high profile Supreme Court cases. Second, this study allows for the Top Ten Percent law intervention to be examined more closely by using panel data and a difference-in-difference method which has not been previously attempted on this scale. Third, challenges to affirmative action have not subsided over the years at both the state and federal level, and percent plans in particular have held up to the scrutiny. Other institutions that still use race-based admissions procedures could look to Texas as a way to maintain diversity without using race if forced to by new laws. Fourth, the most surprising finding is the persistent downward enrollment shift in Texas for African American students, especially when compared to the upward enrollment shift for Hispanic students. Fifth, the overall takeaway is that this research shows that the Top Ten Percent law has helped all minority students, and especially underrepresented minorities students, in Texas attend four-year colleges via public, non-flagship institutions.

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