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# Jockeying for Position: High School Student Mobility and Texas' Top-Ten Percent Rule[*]

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Beginning in 1998, all high school students in the state of Texas who graduated in the top-10 percent of their high school class were guaranteed admission to any public higher education institution, including the University of Texas. While the goal of the policy was to improve access for disadvantaged and minority students, the use of a school-specific standard to determine eligibility could have unintended consequences. Students may benefit from switching schools near the end of their high school career in order to change their peer reference group and increase the chances of being in the top-10 percent. In our analysis of student mobility patterns before and after the policy change, we find evidence that these strategic moves did occur.

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## 1. Introduction

The debate over whether students' race should be factored into college admissions decisions has recently heated up, as the U.S. Supreme Court is currently deliberating the cases of two lawsuits against affirmative action admissions policies at the University of Michigan. These affirmative action policies give preferential treatment towards students in historically underrepresented racial groups. Washington, California, Texas, Florida, and Georgia have already banned race-based admissions in some or all of their public universities. Texas was the first state to do so. In 1996, the Court of Appeals for the Fifth Circuit ruled in the case of *Hopwood v. Texas* that the University of Texas law school could not take race into consideration in admitting students unless such action was necessary to remedy past discrimination by the school itself. After this ruling, Texas ended racial preferences at all state colleges and universities beginning with students applying to enter in the fall of 1997. After mounting public concern regarding falling minority matriculation to elite Texas public universities,[1] then Governor George W. Bush helped push through legislation guaranteeing that all high school seniors with grades in the top-10 percent of their own high school class gain admission to any public university within Texas, regardless of the students' standardized test scores. The Texas program began in the summer of 1998. California and Florida have adopted similar plans and with the forthcoming Supreme Court decision, other states may follow this policy lead.[2]

While x-percent admissions policies ensure that eligibility is distributed evenly across students served in both advantaged and disadvantaged high schools, the fact that eligibility is defined based on a relative standard may have unintended consequences. Whether a given

[1] Bucks (2003) reports that the proportion of first-time student enrollments of Blacks and Hispanics at the University of Texas at Austin was 4.1% and 14.5%, respectively, for the 1996-97 school year, but declined to 2.7% and 12.6% for the 1997-98 school year. At Texas A&M, (the other large, flagship public university), the proportion of Blacks dropped from 3.7% to 2.9% and the proportion of Hispanics dropped from 11.3% to 9.6%.

student qualifies or not depends in part on the abilities and performances of the student's peers. While a student could obtain access to a premier university by raising his or her grade point average, the student could also transfer to a school where he or she would fall into the top-10 percent. This would likely entail attending a high school with lower achieving peers, which provides a countervailing incentive against any behavioral response. To the extent that there is a behavioral response, the logic of admitting the top-10 percent could be undermined—a logic that rests on rewarding academic achievement in the local context.[3]

We conduct three tests to investigate whether there was strategic mobility after the policy change. The first test concerns the distribution of academic ability of students in the top-ten percent of their class. If strategic mobility occurred, then the average ability of top ten percent students would increase, since this type of behavior involves higher achieving students displacing other students from the top decile of the high school class. For the second test, we divide students into groups based on their motive to game the system. Those students with the highest motives are those with a high likelihood of applying to and being rejected by a selective Texas public college. The students with the highest motivation to game the system are expected to attend high schools with lower thresholds for entry into the top decile than students with low motivation. For the third test, we define an "on-track" high school for each junior high school in the state, based on pre-policy junior high school to high school transition patterns. After the policy change, students who expect to place in the top ten percent at the on-track high school should be more likely to attend their on-track high school. Students who do not expect to place in the top ten percent at the on-track high school should be more likely to either transfer or move

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[2] See Horn & Flores (2003) for a description of the x-percent programs and minority recruitment efforts in Texas, Florida, and California.

[3] If students do transfer schools as a result of this policy, then these transfers might also generate unintended benefits through positive peer effects.

residences, in order to attend an "off-track" high school where they have the opportunity to qualify. We further test whether this strategic mobility decision is enhanced for students with high incentives. These strategic responses have the potential to shift the race/ethnicity and socio-economic composition of the beneficiaries of the top-10 percent college admittance program.

The results suggest that students are behaving strategically. Conditional on their 8th grade school, students who were likely to be in the top-ten percent of their local high school were more likely to attend this high school after the policy was implemented. Second, students who were not expected to be in the top-ten percent of this high school were found to transfer to other high schools where they would qualify. This strategic mobility has changed the composition of beneficiaries of the new program. It has raised the average ability level of these qualifiers, raised the average high school thresholds for qualification, and lowered the variance in these thresholds. Finally, it has increased the White and non-poor student share of students who qualify for automatic admission.

Our findings also have more general implications. Since this study uncovers evidence of behavioral responses in a context where the costs of strategizing are quite high, we would expect that endogenous group membership would be important in other contexts where rewards are based on reference groups that can be affected by the participants.

## 2. Background

### *2.1 Policy Description*

The goal of the top-10 percent policy is to raise the college enrollment rate of minority students without specifically using racial preferences. Automatic admission to any of the 35 public universities in Texas is granted if the student is ranked in the top-10 percent of the graduating class and applies to college within two years of graduating. The policy pertains to both public and private high school students. The colleges are allowed to expand the automatic admission to students who are in the top-25 percent of their high school class. However, currently the more selective colleges in Texas have not chosen this option.[4] Table 1 displays which colleges have each type of admissions cutoff, as well as information about the size of enrollment and the admissions selectivity at these colleges, using pre-policy data from Barron's Profiles of American Colleges (1996).[5]

For determining eligibility, the student's class rank is based on his or her position at end of the eleventh grade, middle of the twelfth grade, or at high school graduation, whichever is most recent at the college's application deadline.[6] Fall deadlines for applications to the more selective universities are generally in early February. Therefore, for students applying during their senior year, the rank would be based on either the end of the 11th grade or the middle of the 12th grade. The class rank is computed by the individual high school, and they have discretion on how to handle transfers. School administrators may require transferring students to attend for some period of time before qualifying the student as being in the top-10 percent. As a result, there may be no strategic advantage to late junior and senior year transfers.

*2.2 Participation Rates*

Among 10th-graders, only those students who would consider attending a Texas public 4-year college will be sensitive to the change in admissions policy when deciding which high school to attend. Texas public colleges are the most prevalent destination for high school

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[4] The more selective colleges also tend to require that students admitted under the program take additional college preparatory classes.

[5] The college's relative rankings and enrollments in the 1999 Barron's guide (i.e., post-policy) were quite similar.

students who attend 4-year colleges. Of those freshman students attending a 4-year college in the fall of 1998 who had graduated from a Texas high school in the prior 12 months, 66 percent went to a Texas public college, 13 percent went to a Texas private college, and 21 percent went out-of-state.[7] Although a large majority of college enrollees attend Texas public institutions, overall college enrollment rates are low. Only one-fourth of high school students choose to attend a 4-year college. Thus, the fraction of all 10th graders who enroll in a Texas public college is only about 16 percent.[8] This rate varies by race/ethnicity: 20 percent of white students, 14 percent of black students, 10 percent of Hispanic students, and 38 percent of Asian-American students enroll in a Texas public college.

Since many of these students would have gained admission to their first-choice campus even without the ten percent rule, the fraction of 10th graders who directly benefit from the program is even smaller. We estimate that, in the absence of strategic behavior, no more than 0.5% of all 10th graders would likely benefit from the program due to automatic admission to one of the two large, selective flagship campuses (UT-Austin and Texas A&M).[9] The vast majority of applicants who are in the top decile of their high school class would have been admitted to these campuses even in the absence of the program (Tienda et. al., 2003). Thus, even if only a

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[6] Students in magnet school programs can be treated separately from students at the host school, and have their own top-10 percent students under certain conditions. To qualify, the magnet school program must recruit its students from at least 10 other schools in the district and its student body must constitute at least 35 percent of the total number of students at the host school.

[7] Estimated using data from the Department of Education (2001) and the Texas Higher Education Coordinating Board (1998).

[8] This number was derived by dividing the number of enrolled students by an estimate of the 10th grade population in 1996-97. To produce an estimate of the 10th grade population in 1996-97, we divided the total number of 10th graders in our data on Texas public high schools by 0.953, which is an estimate of the public school share of total enrollment. This number, 0.953, was derived by dividing the number of 1998-99 Texas private high school graduates (9,988; Department of Education, 2001) by the sum of this number and the number of 1998-99 Texas public high school graduates (203,393; Department of Education, 2001).

[9] To find this 0.5% estimate, we first estimated the number of students who were rejected from either UT-Austin or Texas A&M for the entering college class of Fall 1997. Based on pre-*Hopwood* rejection rates for top decile students reported by Tienda et. all (2003), 3.8% for Texas A&M and 6.6% for UT-Austin, we estimate that about 380 and 770 top decile students would have been rejected by these campuses respectively. We then divide the sum of these rejections by the number of students in this cohort during tenth grade. To the extent that some of these rejected students would not have chosen this campus anyway or were rejected from both campuses, this estimate overstates the actual fraction of students who would be positively affected. To the extent that applications are endogenous so that some top decile students were discouraged from applying to these campuses prior to the policy change, this estimate understates the fraction of students who would be positively affected.

small number of students respond strategically to the policy, this number of students could be large relative to the number of students whose admissions outcomes are affected.

Among the first-time, in-state, undergraduate students who enrolled at Texas public colleges in the summer and fall of 1998, 21 percent automatically qualified by being in the top-10 percent of their high school class. This fraction has increased steadily each year and was 25 percent in the fall of 2001. Table 2 displays the enrollment patterns of automatically admitted first-time students across the public universities during the Summer/Fall of 2000. Among students in the top-10% who enrolled, the majority attended either Texas A&M (28.4%) or UT-Austin (29.2%). Only 5% of students enrolled in Texas public universities were automatically admitted at a consequence of being in the top 11-25% of their high school class.

If students gradually become better able to respond to the incentives created by the top ten percent program, then one would expect an increase in the fraction of top ten percent students who enroll in the selective, flagship campuses. Once the program has been in place for a few years, students who wish to significantly increase their chances of admission to UT-Austin or Texas A&M may be better able to raise their grades or choose their high school in order to place in the top ten percent. These strategically motivated students may then displace other students out of the top ten percent who are not interested in attending a selective public university. Trends in attendance rates at UT-Austin and Texas A&M support this prediction. Between 1998 and 2001, the fraction of all top ten percent eligible students attending UT-Austin and Texas A&M increased every year for both schools. Among these top ten percent eligible students, the rate of enrollment in either one of those campuses increased by about 20% over this period.[10] Although longitudinal changes in other factors, such as the desirability and availability of places

[10] This 20% increase is an estimate based on the ratio of the total number of top 10% enrollees who graduated from public *or* private high schools to ten percent of total fall 12th grade enrollments.

in private colleges or places in less selective public universities, might contribute to this trend, this provides evidence that is consistent with a nontrivial strategic response to the top ten percent program.

### *2.3 Racial Group Enrollment During Affirmative Action versus the Top Ten Percent Rule*

Since the motivation behind the top ten percent program was to help undo the decline in racial minority enrollments in the selective campuses after the elimination of affirmative action, other studies (e.g., Kain & O'Brien, 2001; Bucks, 2003; Horn & Flores, 2003; Tienda et. al., 2003) have examined the impact of this policy on racial diversity. These studies find that: (1) the top ten percent program did not restore rates of Black and Hispanic enrollments at UT-Austin and Texas A&M to rates under affirmative action, (2) these post-*Hopwood* rates reflect even greater racial disparities if one controls for test scores[11] or considers that the fraction of high school students who are Hispanic has been sharply increasing, and (3) although there were greater rates of minority enrollment after the adoption of the top ten percent plan than in the prior two years (i.e., during the absence of both the ten percent rule and affirmative action), some of this trend may be due to campuses recruiting minority students more aggressively and offering them more generous financial aid packages.[12]

Table 3 breaks down the fraction of in-state students enrolled in any public university, in UT-Austin, or in Texas A&M, by race and top ten percent status for the first four years of the

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[11] Kain & O'Brien (2001) examine enrollees at Texas public 4-year and junior colleges, and find that after the elimination of affirmative action and the adoption of the top ten percent rule, Black and Hispanic students are less likely to enroll in the selective universities, even when one controls for a wide range of academic and socio-economic characteristics at both the individual and school level. Bucks (2003) finds similar results in nonparametric analyses of Whites and minorities with similar SAT scores. Racial disparities in enrollments at selective colleges might be even more significant, when one considers the national findings of Black & Sufi (2002) that black students were no more likely to attend *any* college in the 1990's than were white students at similar parts of the socioeconomic status distribution.

[12] As described in more detail by Horn & Flores (2003), UT-Austin and Texas A&M both began offering new scholarships to try to increase minority enrollments after the elimination of affirmative action. UT-Austin has two programs that target scholarships to students with low family incomes whose grades are in either the top 25% or top 10% of their class. Texas A&M has added scholarships to top ten percent students from certain urban high schools with large concentrations of racial minority students, regardless of the family income of the individual student.

Top-10 percent program. The share of enrollment that comes from top-10% students has increased for all racial groups. The increase in the overall fraction of Blacks and Hispanics at UT-Austin and Texas A&M may thus be due to increased awareness of the top ten percent program, increased financial aid offered to these students, and/or greater strategic behavior. Where we do find evidence of strategic enrollment in high school, it will be important to identify the race of the strategically influenced students.

## 3. Theoretical Framework for High School Choice and Student Mobility

The joint choice of residential location and elementary and secondary schooling derives from a complicated family maximization problem. We presume that the decisions for families with school-aged children are partly driven by the impact that attending one school system over another will have on their children's future earnings. Holding other neighborhood characteristics constant, families will prefer to have access to schools that increase earnings capacity both directly through skills and knowledge acquisition and indirectly by improving access to institutions of higher education. In this setting, the introduction of a top-10 percent policy increases the relative attractiveness of communities in which the child is likely to be in the top-10 percent of the high school graduating class.

In order to provide intuition concerning the relevant strategic responses and the types of families that might take these actions, we present an indirect utility function that each household will seek to maximize. This indirect utility function is defined from the perspective of families of $8^{th}$-graders making housing and schooling choices for $10^{th}$ grade (consistent with the data discussed subsequently). Although behavior between these grades will not capture all of the strategic responses, our empirical analysis is limited to these grades by data constraints (described below). Our goal is to identify whether households are likely to alter their high school plans between 8th and 10th grade following the introduction of the top-ten percent policy. Therefore, we condition on residential location as of 8th grade and include only the most relevant economic variables that determine the secondary schooling decision.[13]

For simplicity, assume that families have only one child.[14] Define $i$ as an index for both the family and the child, $j$ as an index for the house/neighborhood where the family resides, and $k$ as the index for the high school the student attends. The child's expected future earnings are affected by the student's own ability level ($\gamma_i$),[15] the quality of the student's high school ($Q_k$), and the likelihood of being accepted at a selective college ($p_{ik}$). Define $T_{ik}$ as an indicator variable, which is equal to one if the child will be in the top-10 percent of the class at school $k$. (For simplicity, we assume that individuals can predict this perfectly.) Define *Post* as a dummy variable, equal to one if the top-10 percent admissions policy is in place. Then, the student's likelihood of being accepted at a selective public Texas college is the following: $p_{ik} = \text{Max}[T_{ik} \times Post, a(\gamma_i, Q_k)]$, where $a()$ is the regular admissions system, which is a function of the student's ability and the quality of the student's high school.[16] The child's expected future earnings are thus given by $e_i(\gamma_i, Q_k, p_{ik})$. For students who are unlikely to go to college, or those who would attend a non-selective college even if admitted to a selective college, the third term would not affect their expected earnings.

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[13] Families' rankings of different neighborhood and high school combinations conditional on the eighth grade residence will differ only due to mobility costs.
[14] Within our framework, the presence of multiple children may be viewed similarly as other non-schooling related factors that influence a family's housing choice.
[15] The ability measure $\gamma_i$ can be thought of as a combination of the student's innate ability and the amount of learning that takes place in the years preceding high school.
[16] If newly accepted students displace many students who would otherwise have been accepted, then $a()$ could change post-policy. We abstract from this here, though general reductions in the likelihood of admission across students not in the top-ten percent would tend to reinforce the strategic incentive to attend a school where the student expects to perform relatively better than most peers.

In addition to the child's future earnings, the family's indirect utility is a function of neighborhood characteristics ($N_j$), housing prices inclusive of property taxes ($P_j$), tuition prices if school $k$ is a private school ($\tau_k$), and transportation costs from neighborhood $j$ to school $k$ ($d_{jk}$). If the family chooses to move to a new neighborhood for high school, this will involve fixed mobility costs ($M_{ij}$). Indirect utility is given by the following:

$$(3.1) \quad V_{ijk} = v_i\,(e_i(\gamma_i, Q_k, p_{ik})\,, N_j, P_j, \tau_k, d_{jk}, M_{ij})$$

The family will then choose the neighborhood and high school combination that maximizes their indirect utility (subject to the constraint that, depending on the schools' transferring policies, some neighborhood and school combinations will not be allowed).[17]

For the cohort that we follow from 8th to 10th between 1995 and 1997, we take their 10th grade locations ($j°, k°$) to be the outcomes of the family optimizations in the absence of the top-ten percent policy. In contrast, the locations ($j', k'$) of the cohort that transitions to 10th grade after the reform will reflect changes in the indirect utility provided by different combinations. We assume that general equilibrium effects on housing prices, neighborhood characteristics, school quality, and tuition are likely to be trivial after only two years of policy implementation.[18] Relative to the counterfactual of no reform, family choices for the second cohort will differ due

[17] There are several programs that Texas school districts use to permit transfers without changes of residence. Based on the survey responses of school administrators from 277 Texas school districts for the 1993-94 school year, on average, 1.6 percent of a district's students were transfer students who reside in other districts (National Center for Education Statistics, Schools and Staffing Survey, 1993-94). While some of these inter-district transfers were permitted based on special arrangements, approximately 18 percent of these districts formally offered inter-district transfer opportunities. In terms of intra-district choice (e.g. magnet schools), about 22% percent of the districts in our sample contained more than one regular or magnet high school. Only 5 percent of the districts surveyed for 1993-94 reported that an intra-district choice program was offered, and these are typically the large urban districts. For example, the Houston Independent School District offers a variety of transfer options including magnet programs, majority-to-minority transfers (where the student transfers from a school where her race/ethnicity is in the majority to a school where her race/ethnicity is in the minority), transfers to schools with "underutilized space," and transfers from low-performing schools.

[18] The policy change should increase house prices in communities with low quality schools, since it is these schools where access to selective higher education institutions is improved the most. These capitalization effects would reduce the incentives for strategic transfers to lower average quality schools over time.

to changes in their relative valuations of different schools that arise from changes in $p_{ik}$. A family will alter its plans only if it is true that $V_{ij'k'} > V_{ij^{\circ}k^{\circ}}$ for some feasible $j'$ and $k'$.

Starting from a family's pre-reform ranking of options, only those neighborhoods and schools where the child would end up being in the top-10 percent become relatively more attractive than before. If $T_{ik} = 1$, then $dp_{ik} /dPost$ is positive as the child's chances of being admitted to a selective college increases to 100 percent. For schools where $T_{ik} = 0$, $dp_{ik} /dPost$ is likely to be negative due to spillover effects to the merit-based admissions system, though we did not explicitly model this link.[19] This implies that $dV_{ijk}/dPost$ will increacse if $T_{ik} = 1$ and decrease if $T_{ik} = 0$, as long as indirect utility is increasing in this admissions probability. This would be the case, for example, if the child's $\gamma_i$ is within a range such that the parents are not certain that the child will be admitted to a selective public college, but feel that there are positive net benefits associated with attending this type of college.

The key prediction, then, is that any student who strategically chooses a high school other than the one that would have been chosen before the policy reform should be more likely to attend a school where he/she expects to be in the top-ten percent of the graduating class. The most likely form of behavioral response would be remaining in the same home, but choosing another schooling alternative. The incentives created by the top-10 percent program are not likely strong enough to marginally induce families to change residences. However, for those families who would have moved anyway, the policy change could affect where they move.

These partial equilibrium effects increase the academic ability of students in the top ten percent at a given high school. Assume that there are not general equilibrium effects due to

[19] The elimination of affirmative action in 1997 would also have reduced the probability of merit-based admission for minority students across all campuses. Before the new policy, however, this general drop in the likelihood of admission should not have dramatically changed families' rankings of neighborhood-school pairs. Yet, following the new policy, this general decline would reinforce the value of attending a school where the student would be in the top-ten percent.

changes in prices or changes in the number or types of classmates. Then, the only students whose high school enrollment choices are affected by the policy are those who would otherwise choose a school where they would not be in the top-ten percent. These strategic students thus raise the mean and the minimum[20] level of academic ability within the top decile at the school they choose to attend, since they must have higher abilities than at least one of the students who would otherwise have been in the top ten percent. At the same time, the strategic students do not affect the academic abilities of the top decile at the school they would have attended in the absence of the Ten-Percent admissions program, because these strategic students would not have been in the top ten percent at these schools. Therefore, strategic behavior should raise the mean and minimum level of academic ability in schools' top deciles. This behavior might alter the distribution of these "top ten percent thresholds" across high schools in the state. If high schools with relatively low thresholds receive strategically mobile students, then these high schools' thresholds might catch up to those of other schools. In the extreme, if mobility is costless and if all students in the top-decile of the state's ability distribution have a motive to behave strategically, then we would expect the top-ten percent of each high school to *only* include students in the top-decile of the state's distribution.

Our framework also has implications for which students' high school choices are most likely to be affected by the policy reform. For students with very high ability, $dp_{ik} /dPost$ may be quite small for all $k$ since these students are likely to be admitted in any case. At the other extreme, students with very low ability may have very large $dp_{ik} /dPost$ for some $k$'s that have no effect on the families' rankings of schools since the children are very unlikely to attend college.

[20] The minimum level of achievement among top ten percent students, (i.e., the top ten percent "threshold"), will almost always increase when someone strategically chooses to enroll in that school. The only cases when this is not true are when, due to ties in grade point averages or due to rounding of percentage points, the addition of a top ten percent student does not displace any of the students who otherwise would be in the top ten percent.

Given the lack of strategic incentives for students with very high and low abilities, it will be important to identify a treatment group of students within some reasonable range of ability.

Even among students within this range, the net benefit of attending a high school where a student is in the top-10 percent will vary by ability. The cost of transferring into a school where the student will be in the top-10 percent will be relatively high for students with low abilities. In order to enroll in a top-10 percent school, these students may have to travel farther or attend a school with very low peer achievement. While the costs of attending a top-10 percent school are likely to be higher for students with relatively low abilities, the benefits may also be higher because they have a relatively low chance of being admitted to a selective college if they do not gain this automatic admission. Our empirical analyses use various methods to identify which students should have the strongest incentives to strategically choose their high school.

## 4. Data

### *4.1 Primary Data*

The primary data source for our analysis is individual-level Texas Assessment of Academic Skills (TAAS) test score data collected by the Texas Education Agency (TEA). In the spring of each year, students are tested in reading and math in grades 3-8 and 10, and writing in grades 4, 8, and 10. The student-level test score reports are available for fiscal years 1993 through 2000. Each school submits test documents for all students enrolled in every tested grade. This means that students that are exempted from taking the exams due to special education and limited English proficiency (LEP) status are included, as are students in the 10$^{th}$ grade who have passed alternative end-of-course exams and are not required to take the TAAS exams. The test score files, therefore, capture the universe of students in the tested grades in each year. The number of students in this data ranges from 262,455 (1993) to 303,981 (2000) for 8th graders, and ranges from 224,370 (1994) to 264,021 (2000) for 10th grade students. In addition to test scores, the reports include the student's school, grade, race/ethnicity, and indicators of economic disadvantage, migrant status, special education, and limited English proficiency. The data do not include the student's gender.

TEA provided us with versions of these data that assign each student a unique identification number. This number can theoretically be used to track the same student across years, as long as the student remains within the Texas public school system. However, in practice, there appears to be noise in the matching process. For example, of our 8th graders in 1995, only 70.9 percent show up in 10th grade in 1997. Much of this loss can be explained by legitimate leaving, such as dropping out, transferring to the private sector, and leaving the state. The Texas Public Education Information Management System (PEIMS) enrollment data show that there was a 6 percent drop in the size of this cohort between the fall of 1995 (8th grade) and the fall of 1997 (10th grade). There was an additional 4.5 percent drop during 10th grade.[21] A 10.5 percent loss is easy to explain given the above, and we can add an additional 4.6 percent who repeat 8th or 9th grade but ultimately end up in 10th grade in a later year. That leaves about a 15 percent loss that may be attributable to mis-tracked student IDs. The fraction in 10th grade in 2000 that are also in 8th grade in 1998 is 71.6 percent, so any inability to track students across grades does not appear to have changed much between our pre- and post- periods. In both periods, the students we identify as leaving the public school system will include students we are unable to follow between the two grades for any reason.

[21] This rate is computed by comparing the fall 10th grade enrollment in 1997 to the number of test takers. The official reported dropout rate for 10th grade is 2.2 percent. Thus, our rate is 2.3 percentage points higher than would be expected given the reports. The reported dropout rates for 11th and 12th grades are 2.1 percent and 2.5 percent. Yet, the overall cohort size declines by almost 20 percent from 10th to 12th grade, so there is strong evidence that official dropout rates are under-reported.

*4.2 Predicting Students' Rank*

We would like to be able to predict a student's class rank at any school the student might attend, including what we later define as the "on-track" high school. However, the only outcome variables that we have available to us in the individual-level Texas data are standardized test scores. We, therefore, conduct preliminary analysis using data from the National Education Longitudinal Study (NELS) to determine the relationship between test scores and class rank.

The NELS surveyed a nationally representative sample of 8th grade students in 1988.[22] These students were then followed as they progressed to 10th and 12th grade in 1990 and 1992. Students were tested in reading and math in the base survey, and were asked to provide their class rank in their senior year in the second follow-up. We transform the reading and math test scores to z-scores, and then regress 12th grade rank percentile on these z-scores, including high school fixed effects. We are assuming that higher test scores are associated with a higher class rank regardless of the high school, and include the school fixed effects to account for the fact that a given score will be associated with a lower rank if the student is in a school with more academically talented peers.

Table 4 shows the results for the national sample and separately for Texas students. In the weighted regressions, observations are weighted using the longitudinal student sample weight. For both the nation as a whole and for Texas, math and reading test scores explain slightly more than one third of the variation in class rank within schools. The results are not sensitive to weighting, but we find that the relative importance of math scores is somewhat greater in Texas than in the nation as a whole.

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[22] Students were selected through a two-stage sampling frame, where schools were first selected and then students were randomly selected within schools. The weights appropriate to obtaining a representative student-level sample are provided.

We create a single test score for each student, which is the weighted average of the student's reading and math scores, with the weights proportional to the coefficients from the weighted Texas results. The reading z-score receives a weight of 0.272, and the math z-score is weighted by 0.728.[23] Subsequently, this weighted average will be called the student's "score." We use these results to assign all students to a strict ranking that can then be used to determine percentile ranks within any given school, depending on which students attend. While we could have used reading or math scores alone to proxy for expected rank, the results from the NELS allow us to combine the scores from both exams to more closely approximate class rank.

## 5. Empirical Strategies and Findings

### *5.1 Test 1: Distributional Analysis*

From our theoretical model, we predict that strategic mobility will raise the mean level of academic ability (score) of students in the top decile of their high school, and raise the thresholds to get into the top decile. To test these predictions, we compute the score for all 10th grade students in their school using the weighted average of their 8th grade math and reading test scores.[24] We then create a dummy variable, which equals one if the student is in the top decile of

[23] We separately tested the relation between 10th grade test scores and class rank. The relative weights were similar: 0.232 for reading and 0.768 for math.

[24] Some students are missing either or both scores. About 14 percent of 8th graders are missing reading scores, and about the same percentage are missing math scores. These rates declined from around 15 percent in 1995 to 12 percent in 2000 (although this trend was not observed for 10th grade scores). Among those that are not exempted due to limited English proficiency or special education status, the rates are about 7 percent, each. These students may be missing test scores due to absence or illness on the day of the exam, or for some other idiosyncratic reason. For students that are not exempted from taking a specific exam due to special needs, we impute the missing score from the set of valid data for reading, math, and writing test scores from both the 8th and 10th grade administrations. Since we use 8th grade scores to predict 10th grade scores, we cannot do this distributional analysis for 10th grade students in the first two years of the data, 1993 and 1994. For those 8th grade students that are exempt due to special needs in that subject area, we impute the score from the same 10th grade exam if that score is non-missing, and otherwise assign the student the minimum score on that exam. The scores are transformed into z-scores using the mean and standard deviation among non-exempt students, which means that the average z-score in the whole sample is below zero. We are unable to predict the weighted average score for about 5.5 percent of the 10th grade students, and exclude these students from this analysis. There was no clear trend in this rate across the sample years.

their high school.[25] Finally, we compute the threshold for each high school as the minimum score of students in the top decile. This test requires few assumptions, other than the relation of test scores to the student's subjective predicted rank in high school k.[26]

The results are consistent with strategic mobility. Figure 1 shows the average "ability" level of students who are in the top-10% of their high school class. This "ability" level is the student's percentile rank in the statewide distribution using the weighted average of his or her test scores. As predicted, the average ability level increased pre-policy (1995-97) to post-policy (1998-00) from an average of 91.24% to an average of 91.56%. To test the significance of this change, we regress the average score for the students in the top-ten percent of each high school on a post-policy dummy variable. These regressions are run at the student level, so that the results may be interpreted as an impact for the average Texas public school student. We find similar results if we run these models at the campus level or if we restrict the sample to students at campuses that existed during the entire sample period.[27] The regressions are run in four different ways: OLS, OLS with campus fixed effects, with campus-fixed trends that allow for campus specific post-policy level shifts, and with campus-fixed trends that allow for campus specific post-policy level and trend shifts. The OLS estimates suggest that the 0.32 percentage point increase described above represents a statistically significant change (t-statistic of 2.76 with robust standard errors). The other specifications suggest between a 0.36 and 0.41 percentage point increase in the statewide percentile of students in the top decile of their high

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[25] If more than one student has identical predicted ranks and one of them could be in the higher decile, then they are all counted as in the higher decile. It is thus possible for a school to have slightly more than 10% of its students considered to be in the top decile.

[26] If our measure of this subjective predicted rank is poor, then we would be unlikely to find evidence of distributional changes (even if strategic mobility was occurring).

[27] One finds similar results conducting this analysis at the campus level, provided that one excludes high schools whose enrollment was in the bottom 1% of the Texas distributions and high schools whose thresholds were in the bottom 1% of the Texas distribution (whose students are all special education students).

school. The campus fixed effect and campus specific post-policy level shift estimates were statistically significant (t-statistics of 3.59 and 3.45 respectively).[28]

If this strategic mobility is occurring, we would expect the movers to displace other students who would have been in the top-10% of their high school, and thus we would expect the thresholds to rise. Figure 2 shows the mean threshold to get into the top-10% of the Texas high schools for each of the sample years. Consistent with our prediction, the mean threshold increased from 85.94% (average over the pre-policy years) to 86.44% (average over the post-policy years), and this 0.50 percentage point increase was statistically significant (t-statistic of 2.94). Regression-based tests analogous to those described above suggest that the post-policy average threshold increased by between 0.40 and 0.50 percentage points, with t-statistics ranging from 2.7 to 2.63.

In the absence of mobility costs, we would expect the threshold at every high school to be nearly the same, at approximately the 90$^{th}$ percentile in the state distribution. In this extreme case, strategic mobility would lower the variance in the thresholds. Figure 3 shows the standard deviation of the high school thresholds and shows that the standard deviation fell from 9.70% (average for the pre-period) to 9.11% (average for the post-period). Furthermore, we find that high schools with the lowest initial thresholds had the highest gains. Among schools that were in the sample during the entire period and excluding potential outliers (see footnote 27), the highest threshold in the bottom quartile increased from 83.08% to 83.54%, while the upper quartile thresholds slightly decreased.

[28] The statistical significance of the estimate based on campus specific trends (which allow for post-policy level and trend shifts) was lower, but the coefficient on the trend variable was also insignificant, suggesting that these trends were not driving the results.

These findings would be consistent with an increase in the share of students in the top-decile of their high school who come from the upper ranges of the Texas distribution. In the pre-policy period, 74.2% of students in the top decile of their high school were also in the top decile of the state distribution. In the post-policy period, this fraction increased to 77.7%. Students who are in the third decile of the state distribution have lost representation in the top-10% of their high school classes. These trends are shown in Figure 4. Figure 5 gives more detail on this change in the distribution and shows the probability density function of students in the top decile of their high school for the pre- and post-policy years. Here we see a shift of the distribution towards higher ability students. In particular, we observe a decline in the share for students in the 60$^{th}$ to 85$^{th}$ percentiles of the state distribution, and a gain for students in the 85$^{th}$ to the 97$^{th}$ percentiles. Breaking this down into individual years shows little differences between 1995, 1996, and 1997. However, in the post-policy period the gains at the top of the distribution are increasing over time, which suggests that future strategic mobility could be greater than has been heretofore observed.

*5.2 Sample Selection for Tests 2 and 3*

For our second and third tests, we focus on the transition from junior high school in 8$^{th}$ grade to high school in 10$^{th}$ grade. While strategic mobility could continue to occur after the spring of 10$^{th}$ grade, this mobility is limited by each high school's policy on inclusion of latter-year transfers in their top-ten percent. We follow three cohorts as they make this transition 1993-95 (Cohort A), 1995-97 (Cohort B), and 1998-00 (Cohort C). Each year indicates the spring of the school year. The first two cohorts attended 10$^{th}$ grade under the old admissions regime, and the third attended 10$^{th}$ grade after the new policy had been introduced. All three cohorts would have chosen their 8$^{th}$ grade schools under the old regime, so that these locations are not endogenous to the policy change. We rely on the early cohorts to establish the pre-policy $10^{th}$-grade attendance patterns for $8^{th}$ graders from each middle school. We then explore how these patterns change for the latter cohort whose transitions are affected by the new policy regime. The two pre-policy cohorts will establish pre-policy trends in the $8^{th}$ to $10^{th}$ grade transition.

The central analysis will focus on the 1995-97 transition versus the 1998-00 transition (i.e., Cohort B versus Cohort C). We begin with 275,155 students in the "pre" cohort and 268,133 students in the "post" cohort. In order to control for the introduction of new schools that would lead to secular changes in attendance patterns across our two cohorts, we restrict the sample to stable schools and districts. First, we drop $8^{th}$ grade campuses that do not exist in both cohorts. Second, for each $8^{th}$ grade campus, we define one high school as the natural choice for students in this $8^{th}$ grade school. We label this natural choice the "on-track" high school and define it as the $10^{th}$ grade school attended by the highest percentage of the $8^{th}$ graders from a particular junior high school. Determination of the on-track high school is reasonably straightforward for most junior high schools. For the median $8^{th}$ grader in 1995, 87 percent of his or her classmates who remain in the public school system attend the on-track high school. Across $8^{th}$ grade students, the interquartile range is 75-91 percent. As a second restriction, we drop $8^{th}$ grade campuses where either the on-track high school changes between the two cohorts or the set of nearby schooling options changed.[29] The cases where the on-track high school changes were all cases where fewer than half of the students attended that high school, so that there was not an obvious on-track high school in any case. Finally, we drop students who attended $8^{th}$ grade campuses with less than 10 students in either cohort. These restrictions leave

81% of the original sample. For Test 2, we additionally eliminate students who *attend* a high school that has 50% special education students or is in the bottom 1% of the enrollment distribution (around 20 students), while for Test 3, we eliminate students whose *on-track* high school has these characteristics. These restrictions eliminate around 0.3% of the sample.

*5.3 Test 2: Threshold as a Function of Incentives for Strategic Mobility*

For the second test of strategic mobility, we relate the student's high school threshold to the student's motivation to behave strategically. We predict that students with high motivation will transfer to high schools with lower thresholds. We first must identify students with the highest motivation to behave strategically. We define motive in two ways:

1) High probability of applying to a selective Texas public university. So long as there is any uncertainty in the probability of acceptance (conditional on application) this may be an appropriate measure of motivation.

2) High probability of rejection to a selective Texas public university. Note that the probability of rejection rises with the probability of applying, but falls with academic ability.

We use Texas students in the NELS data to predict these probabilities.[30] Students in the NELS are asked in their senior year of high school to list their first and second choice colleges to which they had applied and whether they had been accepted.[31] We first assign both colleges a selectivity rating using the 1992 Barron's guide. We then create a dummy variable which equals

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[29] In order to identify whether new schooling opportunities became available, we identified every $10^{th}$ grade school that at least 10 percent of $8^{th}$-graders from a given campus attended in 1997 and in 2000 (for the central results). We assumed that new schools were opened or closed if there were any changes in this set of schools.

[30] We separately used all students in the NELS data with similar results. The correlation in the resulting measures of the probabilities of application and rejection (each estimated two different ways) ranged from 91.8% to 99.6%. Also, to check the validity of our approach, we applied a modification of the Tienda et. al. (2003) specification, from their Table 4, to the NELS students. They examined the probability of admission to UT-Austin and Texas A&M using actual applicant and admissions data. For our left hand side variable, we create a dummy variable which equals one if the NELS student was accepted by a public college that was rated "very competitive" or higher by Barron's 1992 guide. We included the same right hand side variables, (with the exception of "feeder high school", which was omitted, and "high school with immigrants," which was proxied by "high school with limited English proficient students"). All of the signs on the included parameters matched the signs of Tienda et. al., which bolsters our confidence in applying the results from the NELS Texas students to our data.

[31] For our purposes, the NELS question is perfectly suited, because we want to know the set of colleges that the student particularly cares about. Also, note that students were re-interviewed two years later and missing acceptance data was filled in.

one if the student sent either of their two applications to a public 4-year college of selectivity rank "very competitive" or higher. A probit regression is then run with this dummy variable on the left hand side and the students' 8th grade reading and math z-scores, and these variables squared, on the right hand side. In an alternative specification, we add the fraction of the student's 12th grade classmates (who were interviewed for the NELS) who took the SAT or ACT test. This variable is added since the demand for college among a student's classmates could raise the student's own likelihood of applying. We then apply these coefficients to the students in the Texas TAAS data. For the Texas data, the percentage of students who take the SAT or ACT is not available at the high school level is not available, but this data is available for each Texas school district in 1997, and we use this district level data to proxy for the high school test taking rate. There were 992 high schools among 1,587 districts in Texas in 1997. Since most Texas districts have only one high school the difference between district and high school level test-taking may not be substantial.

Figure 6 shows the probability of applying to a "very competitive" (or better) public college as it relates to the student's percentile rank in the state.[32] As expected, this probability rises steadily with the students' weighted test scores. For any particular test score, the inclusion of the district test taking rate increases the variance in the probability of applying. Figure 7 shows the probability of being rejected by a "very competitive" (or better) public college as it relates to the student's percentile rank in the state. This probability of rejection generally rises with test scores (since the student is more likely to apply). However, at the highest test score levels, the probability of rejection begins to fall. When district test taking is not included, the probability of rejection peaks at around the 85th percentile in the state.

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[32] Note: Figures 6-8 are based on a random sample of 10,000 8th grade students from the 1995 TAAS data.

Overall, it will be useful to remember that we have four measures of motivation: two definitions (probability of application, probability of rejection) by two specifications (with and without district test-taking). We do not take an *a priori* position on which of these measures is best, as it is difficult to know the basis of student and family motivation. However, we use each of these definitions alternately, to test whether the preponderance of the evidence supports our prediction. Further, note that our measure of the student's motivation likely has a fair amount of measurement error, which will bias us against finding significant effects.

To test our prediction, we regress the top-ten percent threshold at the high school attended on the student's motivation, using the above four estimates. Since the threshold is endogenous, we hold the high school's threshold constant at its "pre-policy" level (1997 in the central results).[33] Conceptually, we believe that students in 8th grade with high motivations will transfer to high schools with lower thresholds (and thus lower quality) after the policy is introduced.

Define $Post_i$ as an indicator for whether the student is in the later cohort. We normalize our measure of the student's motivation (mean=0, standard deviation=1) and define this variable as *Motivation*. The simplest differences specification relates the threshold to a measure of the student's motivation and this motivation interacted with $Post_i$:

$$(5.1)\quad 1997\ Threshold_{\kappa i} = \alpha + \mu \times Motivation_i + \delta \times Post_i + \beta \times Motivation_i \times Post_i + \varepsilon_{i,}$$

[33] This threshold is computed using the 8th grade test scores of the 10th grade students observed in 1997. If the student's 8th grade scores were missing, and if they were not exempted from taking a specific exam due to special needs, we impute the missing score from the set of valid data for reading, math, and writing test scores from both the 7th and 8th grade administrations. For students that are exempt due to special needs in that subject area, we impute the score from the same 7th grade exam if that score is non-missing, and otherwise assign the student the minimum score on that exam. For 10th grade students who were unobserved in 7th or 8th grade, test scores are predicted using their 10th grade scores. We are unable to predict the weighted average score for 4 to 5 percent of 10th grade students, and exclude these students from further analysis. Once 8th-grade campuses whose on-track high school is a predominate special education school are eliminated, the correlation between the actual 10th grade class rank thresholds for the year 2000 and the thresholds calculated from the pre-policy attendance patterns are in the neighborhood of 0.83 for all deciles. This bolsters the validity of our approach, which assumes that high schools can be broadly characterized with respect to test score performance of peers, so that it is reasonable to presume that students have a sense of where they would place relative to peers in a given high school.

$\beta$ captures the change in the relation between the student's motivation to behave strategically and the student's high school threshold after the policy change. We predict that $\beta$ will be negative.

We augment this simple model by a including a fixed effect ($v_{ik}$) for middle school campus and student ability (as measured by the student's quintile rank in his or her 8th grade campus):

(5.2) $1997\ Threshold_{\kappa i} = \alpha + \mu \times Motivation_i + \delta \times Post_i + \beta \times Motivation_i \times Post_i + v_{ij} + \varepsilon_{i,}$

Including the middle school × ability fixed effects is important because the threshold of the high school that the student may attend depends on their middle school locations, and also likely varies by ability within locations. In order for $\beta$ to be interpreted as a response to the policy change, the identifying assumption is that students in the later cohort would otherwise have made the same transitions as students of similar ability who attended the same middle school three years prior.

The results for Cohort B versus Cohort C, shown in Table 5, weakly match our prediction. We find that $\beta$ is negative, for three of our four measures of motivation, and significant when motivation is measured by the probability of rejection. However, we find similar results when we compare Cohort A to Cohort B, where the effect is negative, but insignificant, for all four measures. Thus, there may have been a pre-policy trend that was not changed by the policy.

We implement two additional specifications. In the first, we add a dummy variable for "poor" students (defined as students who receives a free or reduced-price lunch or shows other evidence of disadvantage) and interact this dummy with *Motivation* and *Motivation* × *Post*. Separately, we include race dummy variables and interact these with *Motivation* and *Motivation*

$\times$ *Post*, on the theory that these groups may respond differently to the incentives. We find no evidence that these group variables have significant interactions with *Motivation* $\times$ *Post*.

*5.4 Test 3: Staying "On-Track" Between 8th and 10th grade*

For the third test, we predict whether an 8th grade student will be in the top-10% of their on-track high school class. We make these predictions using the pre-policy thresholds at each high school, because the actual distribution of students across schools in the post-reform cohort could be endogenous. We then predict that students who will be in the top-10% should be more likely to attend this on-track high school post policy. Also, we predict that students who are not expected to be in the top-10% of their on-track high school should be more likely to transfer to other high schools where they will be in the top-10% after the policy is implemented.

For students who are predicted to be in the top-10 percent of their on-track high school, we estimate the following specification:

$$(5.3) \quad Stay_{\kappa i} = \alpha + \mu \times Motivation_i + \delta \times Post_i + \beta \times Motivation_i \times Post_i + v_{ij} + \varepsilon_{i,}$$

where *Stay* is equal to one if the student attends their on-track high school. We expect that both $\beta$ and $\delta$ will be positive, particularly $\beta$. The results, shown in Table 6, match our predictions well for $\beta$, but do not match our predictions for $\delta$. When comparing Cohort B versus Cohort C, we find that $\beta$ is positive using all four measures of motivation (and significant for 2 of the 4 cases). $\beta$ is insignificant (as expected) when we compare Cohort A to Cohort B. Thus, students with high motivation appear to behave strategically. However, these results do not hold for lower motivation students. In particular, $\delta$ is insignificant in the later cohort comparison when it was positive and significant earlier. It should be noted that the effect of *Post* is negative (nearly zero) and insignificant when the *Motivation* terms are taken out of the specification.

The incentives for students who are not predicted to be in the top-10 percent of their on-track high school are completely different. These students should be more likely to not attend their on-track high school and rather attend a high school where they are predicted to be in the top-decile. We define this action "GoTop," and use the following specification[34]:

$$(5.4)\quad GoTop_{\kappa i} = \alpha + \mu \times Motivation_i + \kappa \times Opp_i + \varphi \times Motivation_i \times Opp_i + \delta \times Post_i$$
$$+ \beta \times Motivation_i \times Post_i + \eta \times Opp_i \times Post_i + \phi \times Motivation_i \times Opp_i \times Post_i + v_j + \varepsilon_{i,}$$

where *Opp* is the student's opportunity to attend such an "off-track" school. This opportunity is defined in two ways:

1) There exists an off-track high school within 25 miles of the student's district where the student is predicted to be in the top-10%.
2) There exists an off-track high school within 25 miles of the student's district where the student is predicted to be in the top-10%, and this high school's median student is not substantially worse (ten percentile points) than the median student at the on-track high school.

We expect $\beta$, $\delta$, $\phi$, and $\eta$ to each be positive, particularly $\phi$.

In general, the results match these predictions. The results are shown in Tables 7a (which compares Cohort B to Cohort C) and Table 7b (which compares Cohort A to Cohort B). First, note that *Post* by itself is insignificant in Table 7a, but negative and significant in earlier period. This indicates that the policy change may have turned around a negative trend in these students choosing "GoTop." In the second panel of each table, we add *Motivation* to the specification. We find a generally positive insignificant effect for *Motivation* $\times$ *Post* in Table 7a, that reversed a negative trend in the earlier period. Similar results are found in the third panel, where *Opportunity* (using the first definition) is added to the specification. The coefficients on *Opportunity* $\times$ *Post* are negative but insignificant in the comparison of the later cohorts, while

[34] For this specification, we use only campus fixed effects, rather than fixed effects by campus × quintile to avoid splitting the sample too thinly.

negative and significant when comparing the earlier cohort, thus reversing the earlier trend.[35] The last panel presents the full specification represented in Equation 5.4. Note that in Table 7b, the coefficients on $Motivation \times Opportunity \times Post$ were negative and significant in the earlier cohort, and are now more of a mixed bag, with two of the four coefficient positive (and one significant). Thus, the students with both motive and opportunity to behave strategically were more likely to do so after the policy than other students.

*5.5 Net Effects of Strategic Behavior on Top Ten Percent Composition*

Based on the results shown above, we find that the policy reform led to a reallocation of students across schools. In this subsection, we consider how strategic mobility has affected the composition of those who obtain guaranteed admission to public higher education institutions. Whether behavioral responses affect the composition of the actual top ten percent students in terms of race, ability, or family income depends on the characteristics of the strategic movers.

Table 8 includes the race/ethnicity and income characteristics of the Texas student body pre- and post-policy reform. We report the characteristics of the students who were likely in the top-ten percent of: (1) the statewide test-score distribution, (2) their on-track high school conditional on staying in the Texas public school system, and (3) their actual high school pre-policy.

Both pre- and post-policy, we find that blacks, Hispanics, and low-income students are underrepresented among students in the top-ten percent of both their on-track high school and the high school that they actually attended. This result is similar to the results found in Long (2002) when looking at a national sample in 1992, and it suggests that the recipients of automatic

[35] When the second definition of *Opportunity* is used, the coefficients on $Opportunity \times Post$ are all positive and significant.

admission will be disproportionately white, Asian, and non-poor.[36] However, this under-representation has lessened in the post-policy period.

A rough test of the effects of mobility on the composition of each high school's top-10% can be achieved by comparing the difference between the characteristics of the students in their on-track and actual high schools, pre- and post-policy reform. The difference between the characteristics of the students in their on-track and actual high schools tells us the effect of mobility on composition. We interpret the change in this difference as an estimate of the compositional effects of strategic mobility, assuming that characteristics of ethnic groups that remain in the sample between 8th and 10th grade are similar across the two cohorts. Looking at the difference between columns 4 and 3, we see that the white student share is slightly larger at the schools where students actually attend than at the on-track high school. This difference grew in the post-policy years. This result suggests that strategic considerations raised the white student share of the top-ten percent (and reverses a pre-policy trend that was observed by comparing Cohorts A and B). Likewise, we find that that strategic mobility lowered the share of low-income students in the top-ten percent.

The strategic movers must believe that they will be in the top-ten percent at their new high school. Assuming that they are correct, their movement will raise the peer quality of the recipient schools. As a consequence, the new school's students may benefit from the presence of these relatively high-quality students. Of course, the schools which are losing strategic movers to other schools will suffer a decrease in their average peer quality (as these students are likely to come from the school's 2nd decile). Overall, we would expect a slight reduction in the overall

[36] However, if we could remove students who are likely to be accepted regardless of the new program, the remaining group could be disproportionately black and Hispanic. Kane (2000) finds that students who have a high class rank, but low test scores (i.e., those likely to gain admission by the new program) contains a disproportionate share of black and Hispanic students.

ability segregation across schools (as was also shown in the Test 1 results). This prediction is confirmed again by the last row of Table 8, indicating that ability segregation declined due to strategic mobility.

## 6. Conclusions

Texas's Top-Ten percent program was instituted in 1998 after the elimination of affirmative action following the 1996 *Hopwood v. Texas* decision. The explicit goal of this program was to maintain minority college enrollment, particularly at Texas' selective public universities. However, by basing this admission possibility on school-specific standards, the composition of the eligible population could change due to strategic mobility decisions. If this occurred, it could have adverse unintended consequences, as the characteristics of the beneficiaries could change.

We find evidence that students and families did change their behavior in a strategic manner after the policy was instituted. Conditional on their 8$^{th}$ grade junior high school, students who were likely to be in the top-ten percent of their "on-track" high school were more likely to attend this high school after the policy was implemented. Secondly, students who were not expected to be in the top-ten percent of their "on-track" high school were found to transfer to other high schools where they would qualify. These behaviors were greatest for students with the highest motivations and opportunity to behave tactically.

This strategic mobility has changed the composition of beneficiaries of the new program. It has raised the average ability level of these qualifiers, raised the average high school thresholds for qualification, and lowered the variance in these thresholds. Additionally, it has had an effect on the demographic characteristics of qualifiers. White, Asian, and non-poor students are disproportionately represented among students in the top-ten percent of their high school. Further, we find that the white and non-poor students have increased their rate of movement into schools where they would be in the top-ten percent relative to other groups of students. Lastly, we find a slight reduction is ability segregation as a result of strategic mobility.

While the implied numbers of strategic movers is small, our estimates are biased towards zero for several reasons. First, we are only looking at the transition from $8^{th}$ to $10^{th}$ grade immediately following the introduction of the program. We are underestimating the overall change in mobility to the extent that students are transferring in earlier or later grades. Furthermore, the long-run response to the program may be greater than the short-run response. Even three years after the implementation of new policy, 700 Texas high schools did not send any students to the University of Texas at Austin and 74 high schools produced half of the entering class (Selingo, 2001). As the number of high schools who send students to the state's selective colleges increase, we might expect more students and families to become aware of the value of strategic mobility. Lastly, we may be underestimating the mobility response as our measure of the student's high school rank and likelihood of applying or being rejected by a selective college may not match with student's subjective expectation. Thus, our estimates will be biased towards zero due to this measurement error.

In fact, given the high cost of mobility, the small change in the student's likelihood of acceptance, and the issues discussed above, it is surprising to find any strategic response. We believe that this result shows that individuals do respond to incentives. Furthermore, administrators of government programs whose beneficiaries can be affected by strategic behavior should be concerned that the characteristics of the target population may change in unintended ways. This possibility should be a special concern where the costs of the strategic response are smaller, and the benefits larger, than in the policy considered in this paper.

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Table 1: Selectivity of Texas Public Schools Prior to Automatic Admissions Rules

| University | Automatic Admissions Rule Used in 2002-03 | Admissions Selectivity (for Freshman Class of 1995-96) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Barron's Selectivity Rating | Total First-time Enrolled | % of App.'s Accepted | Median ACT | Median SAT Verbal | Median SAT Math | % Top 1/5 of HS Class | % Top 2/5 of HS Class |
| Texas A&M | Top 10% | Highly Co. | 6072 | 69% | 25 | 500 | 590 | 78% | 95% |
| U. of Texas- Austin | Top 10% | Very Comp. | 6352 | 67% | 26 | 1150 Combined | | 46% | 79% |
| U. of Texas- Dallas | Top 10% | Very Comp. | 471 | 75% | 26 | 530 | 620 | 62% | 87% |
| Texas Tech | Top 10% | Competitive | 3538 | 81% | 22 | 465 | 545 | 43% | 78% |
| Southwest Texas State | Top 10% | Competitive | 2533 | 65% | 22 | 458 | 513 | 48% | 86% |
| University of Houston | Top 10% | Competitive | 2218 | 61% | 21 | 450 | 520 | 49% | 78% |
| U. of Texas- San Antonio | Top 10% | Competitive | 1578 | 74% | 20 | 418 | 468 | 42% | 74% |
| University of North Texas | Top 10% | Competitive | 2583 | 74% | N/A | N/A | N/A | 26% | 36% |
| U. of Texas- Arlington | Top 10% | Less Comp. | 1648 | 91% | 21 | 420 | 500 | 40% | 70% |
| Texas A&M- Galveston | Top 10% | Less Comp. | N/A | 87% | N/A | N/A | N/A | N/A | N/A |
| Sul Ross State | Top 10% | Noncomp. | 428 | 83% | 17 | 350 | 400 | 14% | 36% |
| Prairie View A&M | Top 10% | Noncomp. | 1069 | 99% | N/A | N/A | N/A | N/A | N/A |
| Stephen F. Austin State | Top 25% | Competitive | 1855 | 74% | 20 | 486 | 491 | N/A | N/A |
| Texas A&M- Commerce | Top 25% | Competitive | 720 | 64% | 21 | 430 | 474 | N/A | N/A |
| Sam Houston State | Top 25% | Competitive | 1638 | 77% | N/A | N/A | N/A | 41% | N/A |
| Texas Women's | Top 25% | Less Comp. | 431 | 79% | N/A | N/A | N/A | N/A | N/A |
| Tarleton State | Top 25% | Less Comp. | 1057 | 91% | N/A | 484 | 490 | 26% | 56% |
| Angelo State | Top 50% | Competitive | 1109 | 78% | 21 | 505 | 517 | 40% | 71% |
| West Texas A&M | Top 50% | Competitive | 923 | 92% | N/A | N/A | N/A | 38% | 79% |
| U. of Texas- El Paso | Top 50% | Less Comp. | 1908 | 81% | N/A | N/A | N/A | N/A | N/A |
| Lamar | Top 50% | Less Comp. | 3150 | 86% | N/A | 488 | 477 | N/A | N/A |
| Texas Southern | Open | Competitive | 1872 | 70% | 19 | 420 | 430 | 25% | 70% |
| Texas A&M- Kingsville | Open | Less Comp. | 922 | 86% | 18 | N/A | N/A | 35% | 66% |
| Other Small Satellites: Top 10%: Texas A&M-Corpus Cristi, UT-Tyler; Top 25%: UT-Permian Basin; Top 50%: Texas A&M International; Open: U of Houston-Victoria | | | | | | | | | |

Source: Barron's Profiles of American Colleges, 21st Edition.

Table 2: Proportion of Public Universities' In-State Enrollments Composed of Top 10% & Top 25% First-time Students, Summer/Fall 2000

| University | Automatic Admissions Rule | Total Enrollment | Total In-State Enrollment | Automatic Admittance: Top 10% of High School | Automatic Admittance: Top 11-25% of High School | Enrollment of Top 10% students | |
|---|---|---|---|---|---|---|---|
| | | | | | | As % of Statewide Top 10% Applicants | As % of Statewide Top 10% Enrolled |
| STATE TOTALS | - | 52,666 | 46,611 | 24% | 5% | 75.4% | 100% |
| Texas A&M | Top 10% | 6,685 | 6,305 | 51% | N/A | 21.4% | 28.4% |
| U. of Texas- Austin | Top 10% | 7,684 | 7,074 | 47% | N/A | 22.0% | 29.2% |
| U. of Texas- Dallas | Top 10% | 840 | 625 | 21% | N/A | 0.9% | 1.2% |
| Texas Tech | Top 10% | 4,106 | 3,793 | 19% | N/A | 4.9% | 6.5% |
| Southwest Texas State | Top 10% | 2,625 | 2,028 | 11% | N/A | 1.4% | 1.9% |
| University of Houston | Top 10% | 3,135 | 2,963 | 20% | N/A | 4.0% | 5.3% |
| U. of Texas- San Antonio | Top 10% | 1,828 | 1,782 | 12% | N/A | 1.4% | 1.9% |
| University of North Texas | Top 10% | 2,969 | 2,698 | 15% | N/A | 2.6% | 3.5% |
| U. of Texas- Arlington | Top 10% | 1,685 | 1,602 | 20% | N/A | 2.1% | 2.8% |
| Texas A&M- Galveston | Top 10% | 428 | 335 | 12% | N/A | 0.3% | 0.3% |
| Sul Ross State | Top 10% | 268 | 230 | 3% | N/A | 0.1% | 0.1% |
| Prairie View A&M | Top 10% | 1,346 | 404 | 14% | N/A | 0.4% | 0.5% |
| Texas A&M-Corpus Cristi | Top 10% | 851 | 810 | 17% | N/A | 0.9% | 1.2% |
| U. of Texas- Tyler | Top 10% | 178 | 169 | 37% | N/A | 0.4% | 0.6% |
| Stephen F. Austin State | Top 25% | 2,274 | 2,229 | 13% | 0% | 1.9% | 2.6% |
| Texas A&M- Commerce | Top 25% | 624 | 476 | 10% | 17% | 0.3% | 0.4% |
| Sam Houston State | Top 25% | 1,713 | 1,682 | 0% | 0% | 0% | 0% |
| Texas Women's | Top 25% | 431 | 369 | 16% | 22% | 0.4% | 0.5% |
| Tarleton State | Top 25% | 745 | 681 | 10% | 19% | 0.4% | 0.6% |
| U. Texas-Permian Basin | Top 25% | 150 | 142 | 18% | 27% | 0.2% | 0.2% |
| Angelo State | Top 50% | 1,287 | 1,132 | 14% | 19% | 1.1% | 1.4% |
| West Texas A&M | Top 50% | 901 | 619 | 20% | 0% | 0.8% | 0.1% |
| U. of Texas- El Paso | Top 50% | 2,238 | 1,863 | 12% | 15% | 1.5% | 2.0% |
| Lamar | Top 50% | 1,218 | 1,044 | 10% | 17% | 0.7% | 1.0% |
| Texas A&M- International | Top 50% | 317 | 238 | 22% | 20% | 0.3% | 0.5% |
| Texas Southern | Open | 1,090 | 917 | 7% | 12% | 0.4% | 0.6% |
| Texas A&M- Kingsville | Open | 990 | 960 | 13% | 20% | 0.8% | 1.1% |
| U. of Houston-Victoria | Open | 998 | 773 | 0% | 0% | 0% | 0% |

Source: Data from Texas Higher Education Coordinating Board (2002)

Table 3

Racial Composition of In-State, First-Time Students Enrolled in 4-Year Texas Public Universities, Summer/Fall 1998-2001

| | White | | Black | | Hispanic | | Asian | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| % of All In-State Enrollees | Top 10% | Other | Top 10% | Other | Top 10% | Other | Top 10% | Other | Top 10% | Other |
| 1998 | 14.1% | 47.0% | 1.4% | 10.0% | 3.5% | 17.2% | 2.1% | 4.1% | 21.2% | 78.8% |
| 1999 | 15.4% | 45.5% | 1.6% | 10.1% | 4.3% | 16.0% | 2.3% | 4.0% | 23.7% | 76.3% |
| 2000 | 15.5% | 44.3% | 1.6% | 9.5% | 4.5% | 16.9% | 2.5% | 4.2% | 24.4% | 75.6% |
| 2001 | 16.1% | 42.2% | 1.7% | 10.4% | 5.1% | 16.9% | 2.4% | 4.3% | 25.5% | 74.5% |
| % of UT-Austin, In-State Enrollees | | | | | | | | | | |
| 1998 | 24.4% | 40.7% | 1.1% | 1.9% | 6.6% | 7.2% | 8.3% | 9.1% | 40.6% | 59.4% |
| 1999 | 24.4% | 38.9% | 2.4% | 1.7% | 7.6% | 6.8% | 9.1% | 8.7% | 43.7% | 56.3% |
| 2000 | 27.1% | 36.4% | 2.2% | 1.8% | 8.3% | 5.8% | 9.2% | 8.7% | 46.9% | 53.1% |
| 2001 | 29.2% | 31.4% | 2.1% | 1.4% | 8.5% | 6.4% | 10.7% | 9.3% | 51.0% | 49.0% |
| % of Texas A&M, In-State Enrollees | | | | | | | | | | |
| 1998 | 34.6% | 48.2% | 0.9% | 1.7% | 4.6% | 4.7% | 1.5% | 1.9% | 42.3% | 57.7% |
| 1999 | 38.9% | 45.4% | 1.0% | 1.6% | 4.6% | 4.0% | 0.2% | 0.3% | 46.5% | 53.5% |
| 2000 | 41.5% | 39.6% | 1.2% | 1.3% | 5.3% | 4.9% | 2.0% | 1.8% | 51.1% | 48.9% |
| 2001 | 43.0% | 39.3% | 1.6% | 1.4% | 6.0% | 4.3% | 2.0% | 1.3% | 53.1% | 46.9% |

Source:  Data from Texas Higher Education Coordinating Board (2002)

Table 4
Class Rank Estimated Using 8th Grade Reading and Math Test Scores

| | National | | Texas | |
|---|---|---|---|---|
| | Unweighted | Weighted | Unweighted | Weighted |
| Reading z-score | 0.069 | 0.070 | 0.055 | 0.054 |
| | (0.003) | (0.003) | (0.011) | (0.011) |
| Math z-score | 0.130 | 0.129 | 0.143 | 0.145 |
| | (0.003) | (0.003) | (0.012) | (0.012) |
| Number of Observations | 11,572 | 11,572 | 793 | 793 |
| Adjusted $R^2$ | 0.358 | 0.360 | 0.365 | 0.353 |
| Implied Reading Weight | 0.347 | 0.352 | 0.278 | 0.271 |

Standard Errors are in Parentheses Below the Coefficients.

Data from the National Education Longitudinal Study.

Table 5
Test 2 -- Top 10% Threshold of the High School Attended

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1995-97 versus 1998-00 | | | | | | | |
| Motive | 47.1 | *** | 45.1 | *** | 30.8 | *** | 23.6 | *** |
| | (2.6) | | (2.5) | | (0.0) | | (1.7) | |
| Post | 3.9 | *** | 3.9 | *** | 1.9 | | 3.6 | *** |
| | (1.4) | | (1.4) | | (0.2) | | (1.4) | |
| Motive*Post | 0.7 | | -0.6 | | -3.6 | ** | -3.2 | *** |
| | (1.5) | | (1.4) | | (0.0) | | (1.2) | |
| | 1993-95 versus 1995-97 | | | | | | | |
| Motive | 50.8 | *** | 48.8 | *** | 28.5 | *** | 21.5 | *** |
| | (3.1) | | (2.8) | | (2.1) | | (1.7) | |
| Post | 1.2 | | 1.3 | | 0.1 | | 0.3 | |
| | (1.4) | | (1.4) | | (1.4) | | (1.4) | |
| Motive*Post | -0.9 | | -0.9 | | -3.0 | ** | -1.6 | |
| | (1.3) | | (1.3) | | (1.4) | | (1.2) | |
| Motive = | Pr(Apply) | | Pr(Apply) | | Pr(Reject) | | Pr(Reject) | |
| Including District Test-taking? | Yes | | No | | Yes | | No | |

Standard Errors are in Parentheses Below the Coefficients.
Pr<=1%: "***" , Pr<=5%: "**", Pr<=1%: "*"

Table 6

Test 3 -- Attending the On-Track High School (i.e., "Stay")
For Students Predicted to Be In the Top-10% at That High School

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1995-97 versus 1998-00 | | | | | | | |
| Motive | -1.0% | *** | -1.0% | ** | -0.6% | ** | -0.7% | |
| | (0.4%) | | (0.5%) | | (0.2%) | | (0.5%) | |
| Post | -0.7% | | -0.8% | * | -0.3% | | -0.4% | |
| | (0.5%) | | (0.5%) | | (0.4%) | | (0.4%) | |
| Motive*Post | 1.1% | ** | 0.6% | | 1.0% | ** | 0.2% | |
| | (0.5%) | | (0.4%) | | (0.4%) | | (0.4%) | |
| | 1993-95 versus 1995-97 | | | | | | | |
| Motive | -1.1% | *** | -1.3% | *** | 0.1% | | -0.8% | |
| | (0.4%) | | (0.5%) | | (0.3%) | | (0.5%) | |
| Post | 1.5% | *** | 1.5% | *** | 1.8% | *** | 1.8% | *** |
| | (0.4%) | | (0.4%) | | (0.4%) | | (0.4%) | |
| Motive*Post | 0.4% | | 0.2% | | -0.6% | | -0.2% | |
| | (0.4%) | | (0.4%) | | (0.4%) | | (0.4%) | |
| Motive = | Pr(Apply) | | Pr(Apply) | | Pr(Reject) | | Pr(Reject) | |
| Including District Test-taking? | Yes | | No | | Yes | | No | |

Standard Errors are in Parentheses Below the Coefficients.
Pr<=1%: "***" , Pr<=5%: "**", Pr<=1%: "*"

Table 7a
Test 3 --Attending an Off-Track High School Where the Student is Predicted to be in the Top-10% (i.e., GoTop), For Students Predicted to Be In the Top-10% at Their On-Track High School

| | 1995-97 versus 1998-00 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Post | 0.00% | | | | | | | |
| | (0.02%) | | | | | | | |
| Motive | 0.70% | *** | 0.55% | *** | 0.18% | *** | 0.09% | *** |
| | (0.04%) | | (0.04%) | | (0.04%) | | (0.03%) | |
| Post | -0.05% | ** | -0.04% | * | -0.03% | | -0.01% | |
| | (0.02%) | | (0.02%) | | (0.02%) | | (0.02%) | |
| Motive*Post | 0.06% | * | 0.02% | | 0.00% | | -0.02% | |
| | (0.03%) | | (0.03%) | | (0.03%) | | (0.02%) | |
| Opportunity | 0.49% | *** | 0.49% | *** | 0.49% | *** | 0.49% | *** |
| | (0.06%) | | (0.06%) | | (0.06%) | | (0.06%) | |
| Post | 0.01% | | 0.01% | | 0.01% | | 0.01% | |
| | (0.01%) | | (0.01%) | | (0.01%) | | (0.01%) | |
| Opportunity*Post | -0.02% | | -0.02% | | -0.02% | | -0.02% | |
| | (0.06%) | | (0.06%) | | (0.06%) | | (0.06%) | |
| Motive | 0.34% | *** | 0.21% | *** | -0.04% | | 0.00% | |
| | (0.04%) | | (0.04%) | | (0.03%) | | (0.03%) | |
| Opportunity | -0.56% | *** | -0.25% | *** | 0.28% | *** | 0.45% | *** |
| | (0.07%) | | (0.07%) | | (0.07%) | | (0.07%) | |
| Motive*Opportunity | 1.26% | *** | 0.97% | *** | 0.34% | *** | 0.07% | |
| | (0.09%) | | (0.08%) | | (0.09%) | | (0.07%) | |
| Post | -0.02% | | 0.00% | | 0.04% | | 0.02% | |
| | (0.03%) | | (0.03%) | | (0.02%) | | (0.02%) | |
| Motive*Post | 0.03% | | 0.04% | | 0.05% | ** | 0.03% | |
| | (0.03%) | | (0.03%) | | (0.02%) | | (0.03%) | |
| Opportunity*Post | -0.58% | *** | -0.22% | ** | 0.01% | | 0.05% | |
| | (0.11%) | | (0.10%) | | (0.11%) | | (0.09%) | |
| Motive*Opportunity*Post | 0.65% | *** | 0.21% | * | -0.13% | | -0.12% | * |
| | (0.14%) | | (0.11%) | | (0.12%) | | (0.07%) | |

Table 7b

Test 3 --Attending an Off-Track High School Where the Student is Predicted to be in the Top-10% (i.e., GoTop), For Students Predicted to Be In the Top-10% at Their On-Track High School

| | 1993-95 versus 1995-97 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Post | -0.05% | ** | | | | | | |
| | (0.02%) | | | | | | | |
| Motive | 0.87% | *** | 0.65% | *** | 0.27% | *** | 0.16% | *** |
| | (0.05%) | | (0.04%) | | (0.04%) | | (0.04%) | |
| Post | -0.04% | * | -0.04% | * | -0.05% | ** | -0.05% | ** |
| | (0.02%) | | (0.02%) | | (0.02%) | | (0.02%) | |
| Motive*Post | -0.04% | | -0.05% | | -0.04% | | -0.05% | ** |
| | (0.03%) | | (0.03%) | | (0.03%) | | (0.03%) | |
| Opportunity | 0.65% | *** | 0.65% | *** | 0.65% | *** | 0.65% | *** |
| | (0.06%) | | (0.06%) | | (0.06%) | | (0.06%) | |
| Post | -0.01% | | -0.01% | | -0.01% | | -0.01% | |
| | (0.01%) | | (0.01%) | | (0.01%) | | (0.01%) | |
| Opportunity*Post | -0.12% | ** | -0.12% | ** | -0.12% | ** | -0.12% | ** |
| | (0.06%) | | (0.06%) | | (0.06%) | | (0.06%) | |
| Motive | 0.29% | *** | 0.13% | *** | -0.09% | *** | -0.05% | * |
| | (0.05%) | | (0.04%) | | (0.03%) | | (0.03%) | |
| Opportunity | -0.35% | *** | -0.11% | | 0.26% | *** | 0.51% | *** |
| | (0.07%) | | (0.07%) | | (0.08%) | | (0.07%) | |
| Motive*Opportunity | 1.31% | *** | 1.10% | *** | 0.59% | *** | 0.26% | *** |
| | (0.10%) | | (0.09%) | | (0.09%) | | (0.06%) | |
| Post | 0.02% | | 0.03% | | 0.02% | | 0.02% | |
| | (0.02%) | | (0.02%) | | (0.02%) | | (0.02%) | |
| Motive*Post | 0.06% | ** | 0.07% | ** | 0.05% | ** | 0.06% | *** |
| | (0.03%) | | (0.03%) | | (0.02%) | | (0.02%) | |
| Opportunity*Post | 0.04% | | 0.10% | | 0.07% | | -0.01% | |
| | (0.08%) | | (0.08%) | | (0.09%) | | (0.09%) | |
| Motive*Opportunity*Post | -0.17% | * | -0.25% | *** | -0.26% | *** | -0.20% | *** |
| | (0.10%) | | (0.09%) | | (0.10%) | | (0.07%) | |

Table 8
Effect of Strategic Mobility on the Race and Ability Characteristics of Students in the Top-10%

| | Pre-Policy: 1995-97 | | | | | Post-Policy: 1998-00 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | *4-3* | 5 | 6 | 7 | 8 | *8-7* | ***(8-7) - (4-3)*** |
| Group | Whole State | Top-10% in State | Top-10% at Ontrack HS & $Y_{leave} = 0$ | Top-10% at Actual HS | *8th to 10th Mobility Effect* | Whole State | Top-10% in State | Top-10% at Ontrack HS & $Y_{leave} = 0$ | Top-10% at Actual HS | *8th to 10th Mobility Effect* | ***Difference in 8th to 10th Mobility Effect*** |
| White Share | 51.0% | 81.3% | 69.7% | 70.3% | *0.58%* | 49.0% | 73.4% | 60.4% | 61.2% | *0.83%* | ***0.24%*** |
| Asian Share | 1.9% | 4.8% | 4.1% | 4.0% | *-0.13%* | 2.1% | 5.5% | 4.2% | 4.0% | *-0.25%* | ***-0.13%*** |
| Black Share | 12.4% | 2.7% | 4.9% | 4.6% | *-0.24%* | 12.6% | 4.3% | 6.5% | 6.3% | *-0.22%* | ***0.02%*** |
| Hispanic Share | 34.7% | 11.2% | 21.3% | 21.0% | *-0.22%* | 36.3% | 16.9% | 28.9% | 28.5% | *-0.35%* | ***-0.14%*** |
| | | | | | | | | | | | |
| Non-Poor Share | 60.4% | 88.8% | 80.7% | 80.8% | *0.11%* | 56.6% | 82.6% | 71.2% | 71.7% | *0.50%* | ***0.39%*** |
| Poor-Share | 39.6% | 11.2% | 19.3% | 19.2% | *-0.11%* | 43.4% | 17.4% | 28.8% | 28.3% | *-0.50%* | ***-0.39%*** |
| | | | | | | | | | | | |
| Average Ability Within TX Distribution | 50.0% | 94.8% | 92.7% | 92.8% | *0.04%* | 50.1% | 94.8% | 92.4% | 92.5% | *0.06%* | ***0.02%*** |

Figure 1
Mean Student in Top-10% of Own High School

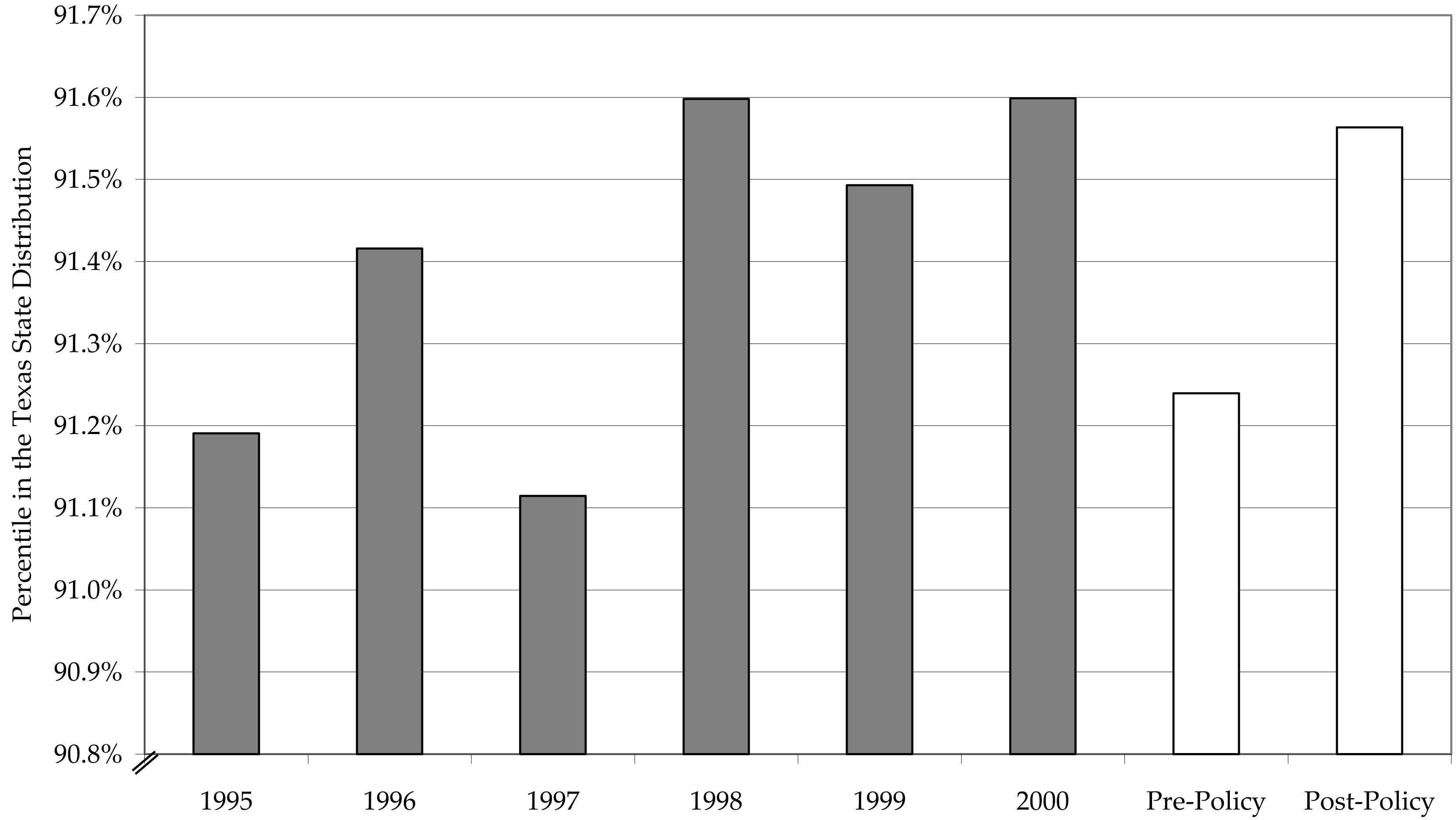

Figure 2
Mean Threshold To Get In Top-10% of Own High School
(High Schools Weighted By Number of Students)

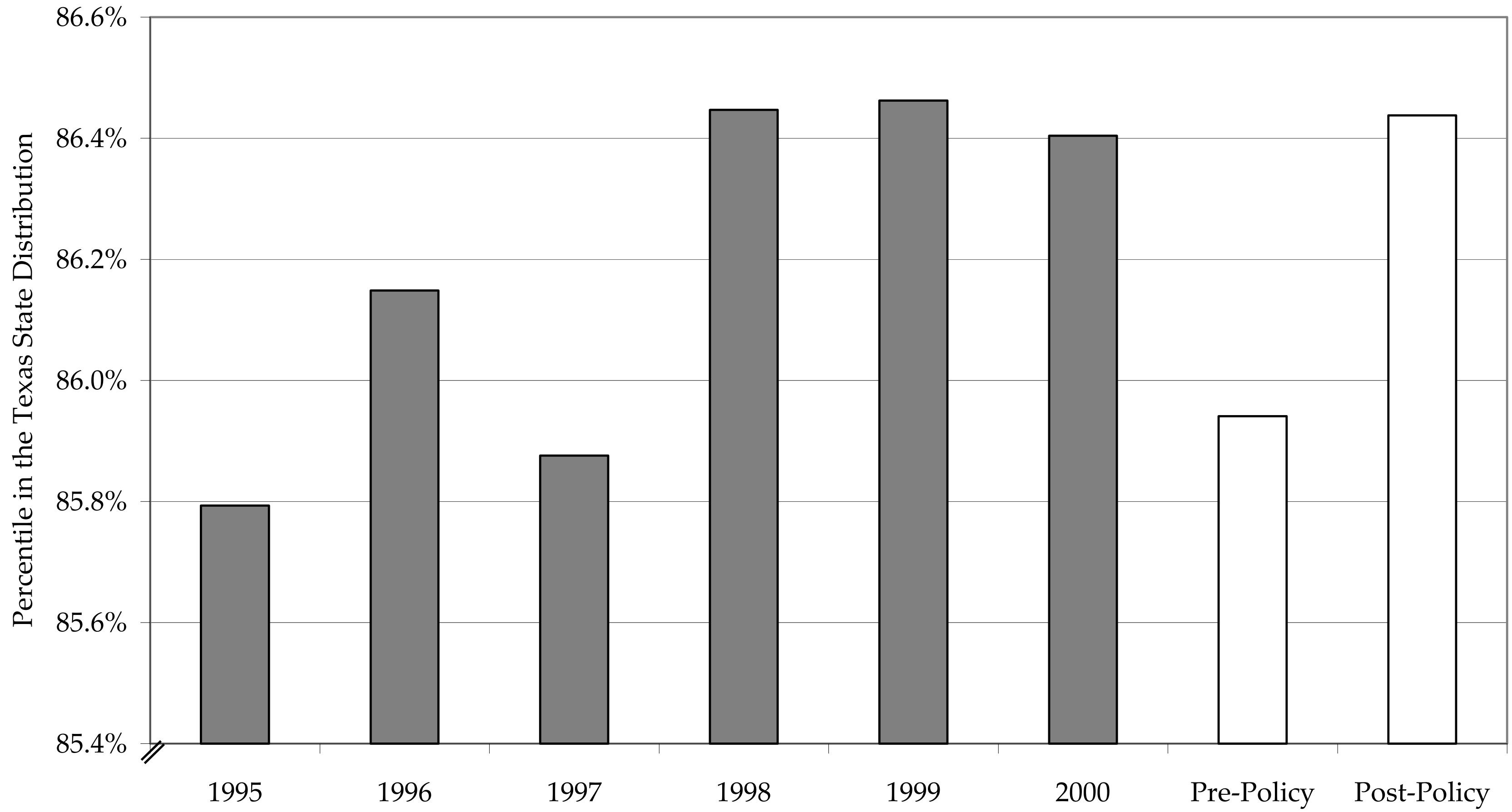

Figure 3
Standard Deviation of the Threshold To Get In Top-10% of Own High School
(High Schools Weighted By Number of Students)

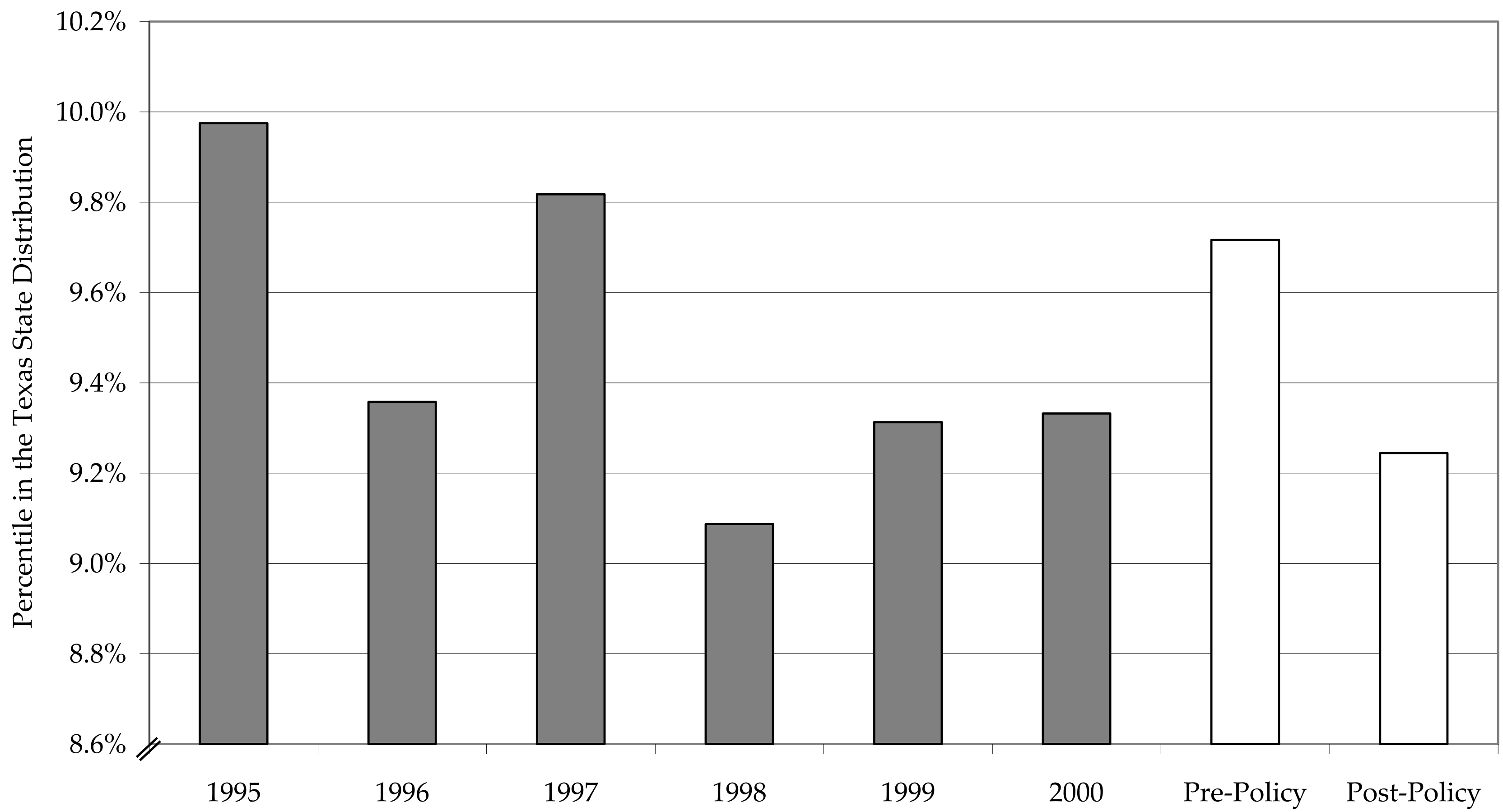

Figure 4
Fraction Who Are In The Top-10% of Own High School Class
by Top and Third Decile in the State Distribution

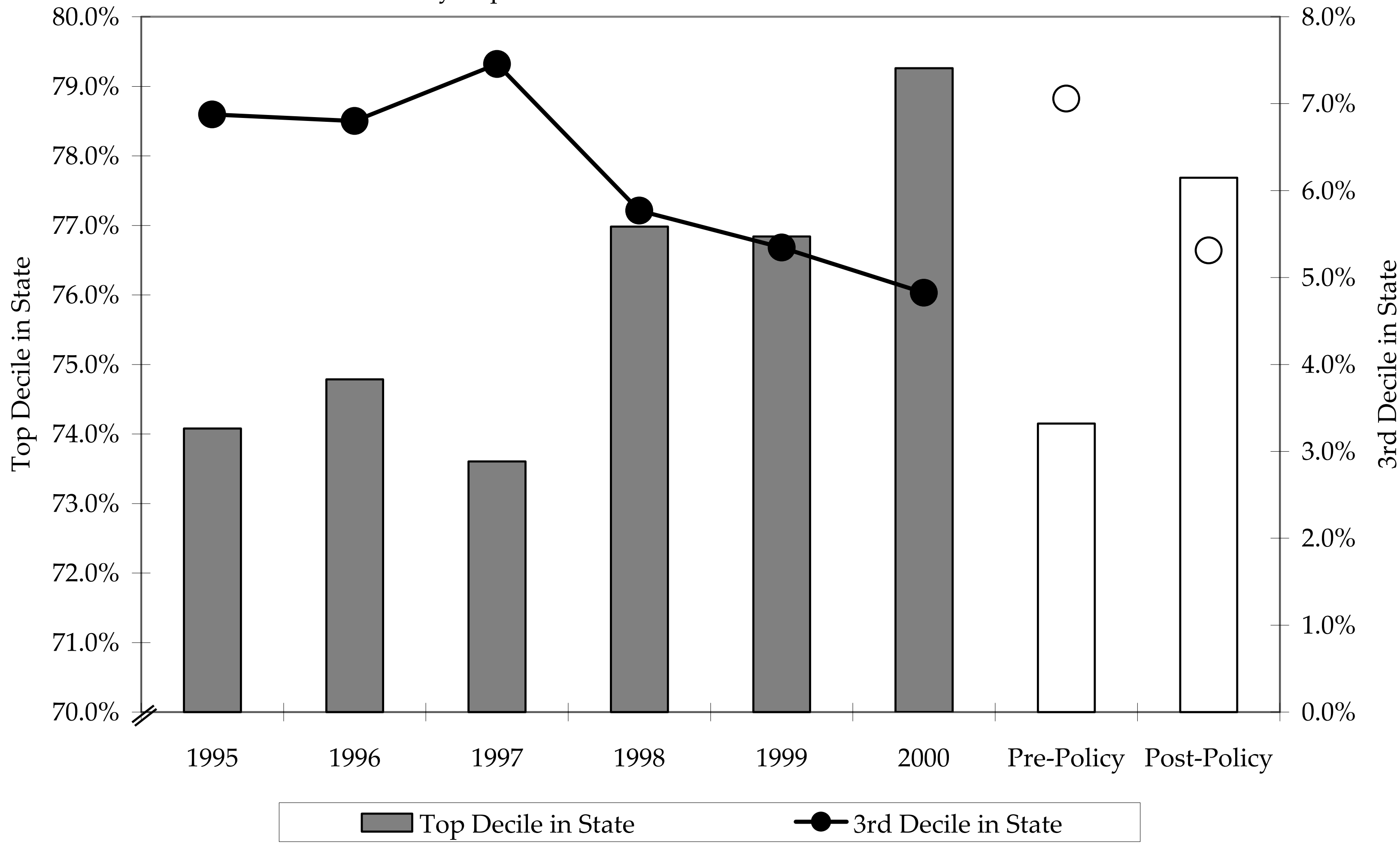

Figure 5
Share of Students in the Top-10% of Their 10th Grade Class
1995-97 Average Versus 1998-2000 Average

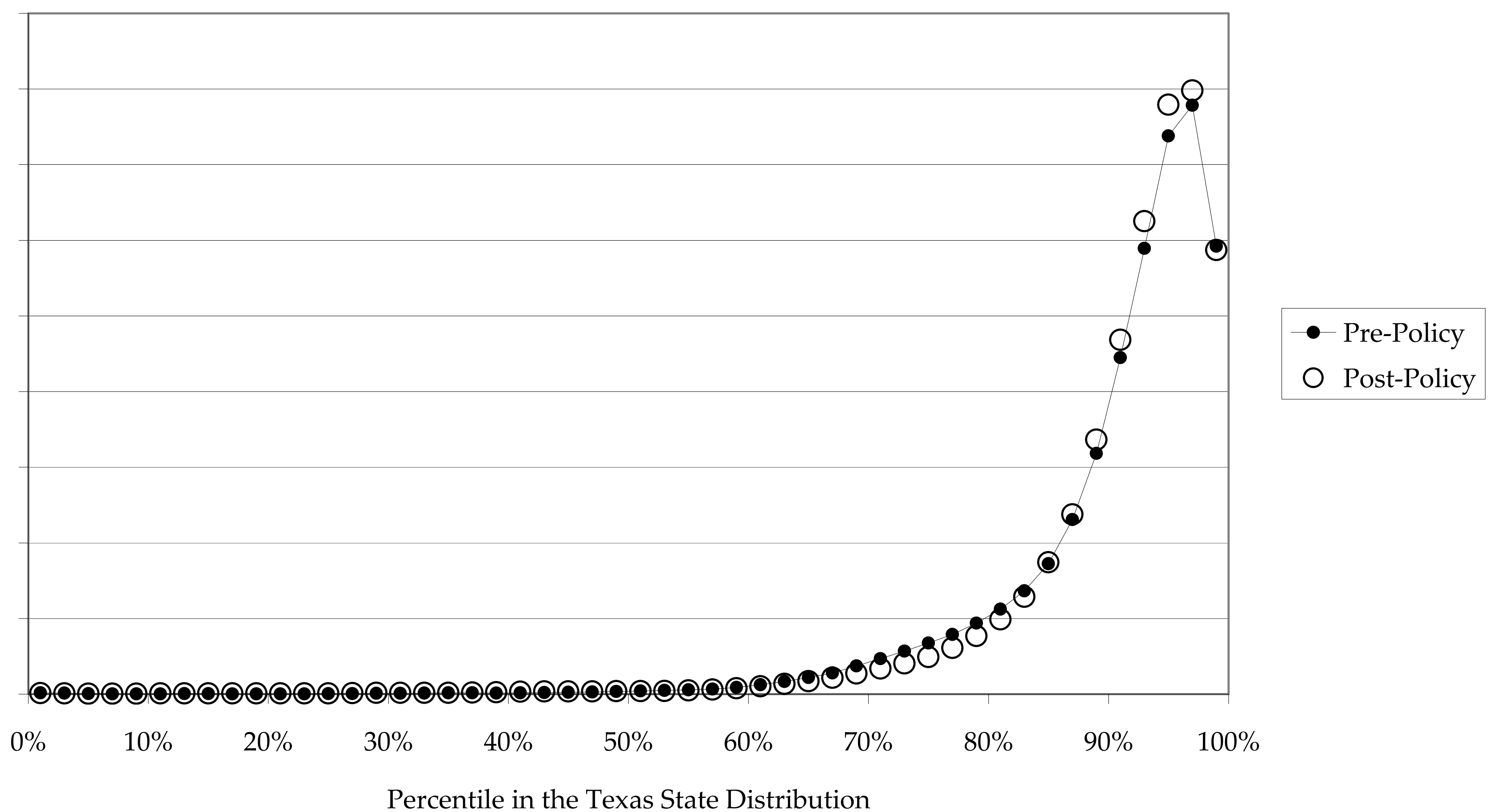

Figure 6
Probability of Applying to a Very Competitive (or Better) Public College

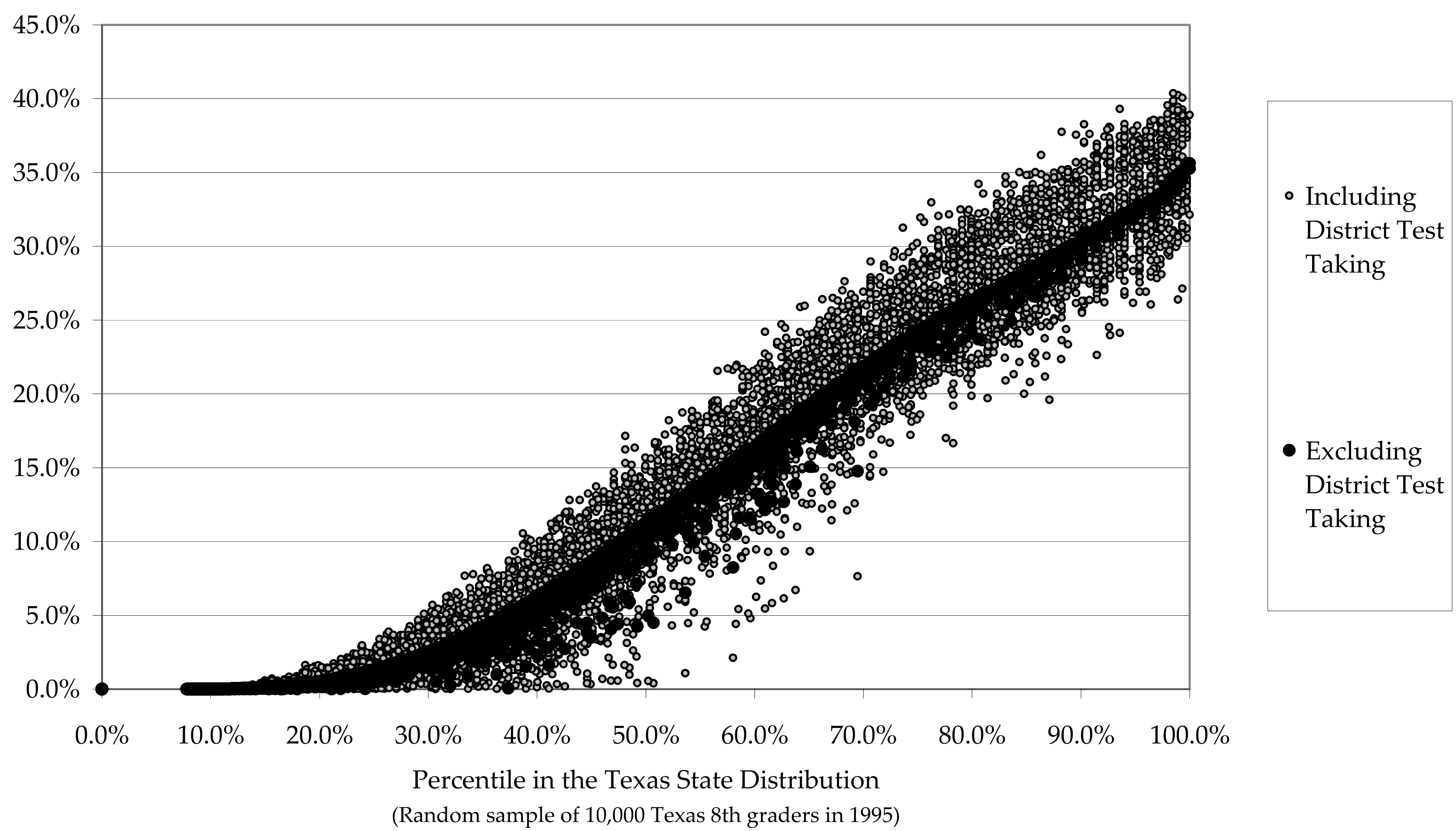

Figure 7

Probability of Rejection by a Very Competitive (or Better) Public College