Preliminary and Incomplete

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

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Abstract: Beginning in 1998, all high school students in the state of Texas who graduated in the top-ten percent of their high school class were guaranteed admission to any in-state public higher education institution, including the University of Texas. While the goal of the policy is to improve college access for disadvantaged and minority students, the use of a school-specific standard to determine eligibility could have unintended consequences. Students may increase their chances of being in the top-ten percent by choosing a high school with lower-achieving peers than they otherwise would have. In our analysis of student mobility patterns between 8th and 10th grade before and after the policy change, we find evidence that this incentive did indeed influence students' enrollment choices in the anticipated direction.

Keywords: Endogenous group membership; School choice; College admission; Affirmative action

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1. Introduction

One of the fundamental difficulties confronting the design of effective redistributive policies is targeting benefits to intended beneficiaries without attracting imitators. There is an extensive literature documenting the extent to which individuals alter behavior in order to qualify for welfare programs, such as by reducing labor supply, changing living arrangements, and even moving to new jurisdictions. In this paper, we analyze this type of phenomenon in a novel setting where eligibility is determined by a tournament and there is scope for endogenous group membership. In particular, we explore whether students downgrade when choosing a high school, when access to a benefit—guaranteed admission to flagship universities—depends on relative position within one's class.

The policy that we consider, the Texas top-ten percent plan, arose from the debate over whether universities should be allowed to consider a student's race in their admissions decisions. In 1996, the Fifth Circuit Court of Appeals ruled in the case of *Hopwood v. Texas* that race may not be used as a factor. Though the Supreme Court later upheld the constitutionality of non-formulaic affirmative action policies, the *Hopwood* decision led to a ban on affirmative action at all public universities in Texas beginning in 1997.[1] In response to mounting public concern regarding the ensuing drop in minority matriculation to elite Texas public universities,[2] then Governor George W. Bush helped push through legislation guaranteeing that all high school seniors with grades in the top-ten percent of their own high school classes gain admission to any public university within Texas. The Texas program began in the summer of 1998 and, since then, California and Florida have adopted similar plans and several other states are poised to consider related referenda.[3]

These *x*-percent plans potentially improve access to higher education for disadvantaged students by using a school-specific standard. The admission guarantee ensures that students at low-achieving high schools, who tend to be disproportionately poor and minority, are equally represented among those automatically granted access to public universities. However, these policies may also lead to behavioral responses that alter the composition of student bodies at these schools. Consider a student who would place below the top-ten percent at a given high school that this student would have attended in the absence of the reform. With the reform in place, this student might be able to obtain guaranteed access to a premier university either by raising his or her grade point average without changing high school enrollment plans, or by choosing to attend (or transfer to) another high school with lower-achieving peers, where he or she would be more likely to be in the top-ten percent.

Since these policies change the relative attractiveness of schools, they could therefore have unintended positive and negative consequences. If relatively able or advantaged students are more likely to attend previously undesirable schools as a result, then these transfers would

[1] In *Gratz v. Bollinger* (2003), the Court found the University of Michigan's undergraduate admissions policy of assigning a set amount of additional points to applicants in underrepresented racial groups to be unconstitutional. However, in *Grutter v. Bollinger* (2003), the Court upheld the constitutionality of the University of Michigan Law School's admissions policy, in which the committee factors in an applicant's race without an explicit formula, in order to come up with a "critical mass" of students of various races. While non-formulaic affirmative action may be permissible under federal law, voter referenda and administrative decisions in four other states (California, Florida, Washington and Michigan) have also banned race-based admissions at public universities.

[2] Between 1995 and 1997, black, Hispanic, and Native American students' share of enrollment fell from 20.3 percent to 16.0 percent at the University of Texas at Austin and from 19.9 percent to 13.4 percent at Texas A&M University (Long, 2007).

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

reduce stratification and might generate positive spillovers to students in the recipient schools through peer effects. At the same time, this enrollment response might skew access to higher education to those students with otherwise better outside opportunities. In particular, this response may crowd out some of the automatic admissions slots that would have gone to disadvantaged and minority students. In this paper, we remain agnostic about the welfare implications and attempt to detect and quantify any high school attendance response to the new admissions program in Texas.

Our analyses, which follow the high school attendance patterns of 8th graders from the 1992-93 through 1997-98 cohorts, suggest that students did indeed respond strategically. Conditional on their 8th grade school, students with the motivation to respond (e.g., those achieving in ranges where college application is likely and admission is uncertain) attended high schools with relatively lower top-ten percent achievement thresholds after the policy change. Since we hold the thresholds fixed at initial year levels, the observed changes isolate shifts in attendance and are not confounded by other time-varying policies that might affect the relative performance of high schools. Trading down behavior is most apparent when we restrict the sample to students in districts served by multiple high schools where alternative schooling options are more readily available. This strategic mobility has raised the average ability level of qualifiers and the average high school achievement thresholds for qualification.

Our findings have more general implications as well. 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 allocated to individuals based on group membership and group membership can be affected by individual choices.

Our paper unfolds as follows: Section 2 provides background information concerning college admissions in Texas, Section 3 presents a conceptual framework for how an *x*-percent rule might influence high school enrollment decisions, and Section 4 describes our data. The empirical strategies for testing the hypotheses and the results are presented in Section 5, while Section 6 offers a brief conclusion.

2. Background

2.1 Policy Description

The immediate goal of the top-ten percent policy is to raise the college enrollment of minority students at selective Texas universities 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-ten percent of the graduating class and applies to college within two years of graduating.[4] 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. Appendix 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

[4] As described by Horn and Flores (2003), the flagship universities have introduced targeted complementary scholarship programs. UT-Austin has implemented one program that targets low-income students who do well in academically inferior high schools, and another program that targets funds to top-ten percent students attending a select group of high schools that have traditionally sent few students to UT-Austin. Texas A&M has added a similar scholarship program for top-ten percent students from certain urban high schools with large concentrations of minority students.

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 the end of the 11th grade, middle of the 12th grade, or at high school graduation, whichever is most recent at the college's application deadline. Application deadlines for fall matriculation to the more selective universities are generally in early February. Therefore, for students applying during their senior year, top-ten percent eligibility would be based on their class rank either at the end of the 11th grade or in the middle of the 12th grade. Class rank is computed by the individual high school, and administrators have discretion regarding the formula and how to handle transfers. To avoid displacing incumbent students, school administrators can require transferring students to attend for some period of time before qualifying as being eligible for top-ten percent placement. As a result, there may be no strategic advantage to transferring during junior or senior year.

2.2 Participation Rates

Among 10th graders, only those students who would consider attending a Texas public four-year college will be sensitive to the change in admissions policy when deciding which high school to attend. Most Texas high school students who attend four-year colleges enroll in Texas public colleges. Of those college freshmen attending a four-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.[6] Overall college enrollment rates of Texas high school students are low; only one-fourth of high school students attend a four-year college. Thus, the fraction of all 10th graders who enroll in a Texas public college is only about 16 percent.[7] 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 Texas high school students enroll in a Texas public college. Appendix Table 2 displays the enrollment patterns of first-time students across the public universities during the Summer/Fall of 2000.

Among students in the top-ten percent who enrolled, the majority attended one of the two flagships, Texas A&M (27.5 percent) and UT-Austin (29.1 percent). Using a rough estimate, we find that, in the absence of behavioral responses, only about 0.1 percent of all 10th graders would have benefited from automatic admission to one of the two flagships.[8] Nearly all applicants placing in the top decile of their high school class had been admitted to these campuses even in the absence of the ten percent rule. However, the fraction of students potentially benefiting from automatic admission is much larger than this fact would suggest once endogenous applications and school choice are considered. The policy change has led to a sizeable increase in the number of high schools represented among flagship applicants (Montejano, 2001; Saenz, 2007). While half of UT's enrollment came from only 59 high schools in 1996, this number rose to 104 by 2006 (Saenz, 2007).

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

[6] These figures are estimated using data from the Department of Education (2001) and the Texas Higher Education Coordinating Board (1998).

[7] We calculated this percentage by dividing the number of enrolled students by an estimate of the 10th grade population in 1996-97. The estimate of the 10th grade population is calculated by dividing the number of public school 10th graders observed in our data by 0.953, which in turn is an estimate of the public school enrollment share, found by dividing the number of 1998-99 Texas private high school graduates by the total number of 1998-99 Texas high school graduates (Department of Education, 2001).

[8] Between the years 1992 and 1997, only 817 (3 percent) of the in-state top-ten percent applicants to UT-Austin were rejected, while only 535 (2 percent) of such applicants to Texas A&M were rejected (authors' calculations based on administrative admissions data from the Texas Higher Education Opportunity Project). Thus, on an annual basis, roughly 225 in-state top-ten percent applicants were rejected at one of these institutions, or 0.01 percent of Texas tenth grade students in 1996 (251,786).

The top-ten percent policy currently poses a challenge for UT-Austin since the share of students automatically admitted has doubled to 80 percent (Schevitz, 2008), leaving less flexibility for the university to use its discretion in admitting students.[9] The concern that top-ten percent students are crowding-out admissions slots for other meritorious students has led to a backlash from families of students attending more elite, typically suburban, high schools.[10] The incentive for strategic high school choice has clearly strengthened relative to the initial years of the regime, which are the subject of our analysis.

3. Theoretical Framework for High School Choice

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 expectation that attending one school system over another will have an impact on their children's future earnings and their ability to get admitted to their preferred college. Holding other neighborhood characteristics constant, families will prefer to send their children to schools that increase earnings capacity both directly through skills and knowledge acquisition and indirectly by improving access to institutions of higher education. Thus, the introduction of a top-ten percent policy increases the relative attractiveness of communities in which the child is likely to be in the top-ten 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 8th graders making housing and schooling choices for 10th grade (consistent with the data discussed subsequently). Enrollment transitions between these grades are appropriate to study for two reasons. First, most students move from a middle school to a high school between these grades and it might be sensible for parents to consider enrollment changes at this time since their child is already changing campuses. Second, many if not most strategic moves should occur between these two grades since high schools may exclude later term transfer students from the top-ten percent group.

For simplicity, assume that families have only one child. 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 (γ_i),[11] the quality of the student's high school (Q_k), and the likelihood of being accepted at a public Texas college (p_{ik}). Define T_{ik} as an indicator variable, which is equal to one if the child will be in the top-ten percent of the class at school k. Here we assume that individuals can predict this perfectly, though incorporating uncertainty would be straightforward. Define *Post* as a dummy variable, equal to one if the top-ten percent

[9] In 2007, the state legislature considered a bill to cap the share of the class receiving automatic admission to half of the admitted class; however, this effort failed. Lawmakers supportive of the status quo fought to protect the increased access for their constituents. State representative Warren Chisum, who voted against the bill said, "Top 10 percent is really important to the people in rural Texas … A lot of times it's the only way we can get into the big universities" (Hughes and Tresaugue, 2007).

[10] For anecdotal evidence, see the 60 Minutes episode, "Is The "Top 10" Plan Unfair?," which aired in October 2004. Also, see Hart (2001), Yardley (2002), and Glater (2004).

[11] The ability measure γ_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.

admissions policy is in place. Then, the student's unconditional likelihood of being accepted at a public Texas college is the following: p_{ik} = Max[$T_{ik} \times Post$, $a(\gamma_i, Q_k)$] $\times c(\gamma_i, Q_k)$, where *a()* is the regular admissions system and *c()* is the student's likelihood of applying to a public Texas college, both of which are functions of the student's ability and the quality of the student's high school.[12] The child's expected future earnings are thus given by $e_i(\gamma_i, Q_k, p_{ik})$.

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

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).[13]

For the first three 8th grade cohorts that we follow, 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 subsequent three cohorts that transition 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 small within the first years of policy implementation.[14] Relative to the counterfactual of no reform, family choices for the second set of cohorts will differ due 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-ten percent become relatively more attractive than before. If $T_{ik} = 1$, then $\frac{\partial p_{ik}}{\partial Post} = (1 - a(\gamma_i, Q_k)) \times c(\gamma_i, Q_k)$ is positive as the child's chances of being admitted to a Texas public college increase to 100 percent. For schools where $T_{ik} = 0$, $\frac{\partial p_{ik}}{\partial Post}$ is likely to be negative due to spillover effects to the merit-based admissions

[12] If newly accepted students displace 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. It is also possible that *c()* changes post-policy. Our empirical approach implicitly assumes that there is not a systematic reversal of the ranking of students in terms of their (unconditional on applying) propensities to be accepted or rejected by a public college.

[13] There are several programs that Texas school districts use to permit transfers without changes of residence. Texas adopted a formal, statewide inter-district choice program in 1995, but participation in this program is fairly low given that districts are allowed to abstain from admitting any transfer students. Based on the survey responses of school administrators from 270 Texas school districts for the 1999-00 school year, an average of 2.8 percent of a district's students were transfer students who reside in other districts (authors' calculation based on data from the National Center for Education Statistics, Schools and Staffing Survey, 1999-00). Many of the large urban districts in Texas also offer intra-district school choice programs. For example, during this period the Houston Independent School District offered 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. Of the districts in our sample, 22 percent contain more than one regular or magnet high school and these districts serve the majority of students.

[14] 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.

system, though we did not explicitly model this link. This implies that $\frac{\partial V_{ijk}}{\partial Post}$ will increase 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 γ_i is within a range such that the parents are not certain that the child will be admitted to a Texas 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 an alternate school. The incentives created by the top-ten 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 to.

These partial equilibrium effects should increase the academic ability of students in the top-ten percent at any given high school. In the absence of general equilibrium effects due to changes in prices or peer quality, 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. By "trading down," these strategic students thus raise the mean and the minimum level of academic ability within the top decile at the school they choose to attend. At the same time, strategic students have an indirect positive effect on the threshold at the schools they depart.[15] Therefore, strategic behavior should raise the mean and minimum level of academic ability in schools' top deciles and alter the distribution of top-ten percent thresholds across high schools in the state. Thresholds at relatively low-achieving schools will tend to converge toward those at higher-achieving 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 include *only* students who are 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 possibility of automatic admission. Students with the greatest propensity to apply to *and* be rejected by a public Texas college should be affected the most, since $\frac{\partial p_{ik}}{\partial Post}$ at schools where the student can place in the top-ten percent is simply equal to the *unconditional* likelihood of being rejected. Students with more modest ability may have very large changes in the likelihood of admission to a Texas public college given attendance at some schools, *k*. Yet given these students' low likelihoods of applying to college (i.e., low *c()*), they will have small values of $\frac{\partial p_{ik}}{\partial Post}$ and thus little change in their families' rankings of high schools.

Figure 1 shows the share of students who apply to and the share rejected by universities rated by Barron's as "very competitive" or higher by the student's "ability" (as defined below).[16] We examine applications to all universities and for public universities located in the student's state.

[15] Such transfers would lower overall enrollment at the departed school, and thereby reduce the total number of top-ten percent slots at this departing school. Consequently, the academic ability threshold would rise at the departing school as well.

[16] This figure is based on students in the National Education Longitudinal Study (NELS). 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. 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.

This figure reveals two key insights. First, the share applying to highly selective institutions rises monotonically with ability. Thus, if students do not have any information about their conditional likelihood of being rejected, then we should expect to see the most strategic behavior exhibited by the most able students. Second the unconditional probability of being rejected by any highly selective university also rises monotonically by ability. That is, while an increase in the student's ability lowers their probability of rejection *conditional* on application, the substantial positive effect of ability on the probability of applying dominates the conditional effect and thus raises the unconditional probability of rejection. However, if we restrict the analysis to in-state public universities, the unconditional probability of rejection peaks in the third decile of the ability distribution, then modestly falls. Thus, if students have perfect information about their conditional likelihood of being rejected, then we *might* expect to see strategic behavior exhibited most by students in the third decile of the ability distribution.

Since it is unclear the degree to which parents of 8th graders have information about the likelihood of admission, and it is unclear whether motivation is based on desire for entry to *any* very selective institution versus an *in-state, public,* very selective institution, we will remain agnostic about the exact point in the ability distribution where we should expect to see policy responses. However, this figure makes it clear that we should not expect to see as much response for less able students.

In order to enroll in a top-ten percent school, a middling ability or geographically isolated student may have to travel farther or attend a school with very low peer achievement. Thus, we expect to see more strategic behavior by students with nearby opportunities to be in a high school's top-ten percent, particularly if that nearby opportunity is within the same school district and otherwise relatively attractive. In our empirical analyses, we identify students with such opportunities.

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. Each school submits test documents for all students enrolled in every tested grade. These documents include information on students that are exempted from taking the exams due to special education and limited English proficiency (LEP) status and 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. 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. TEA provided us with a unique identification number for each student. This number is used to track the same student across years, as long as the student remains within the Texas public school system.[17]

[17] There appears to be relatively little noise in the matching process. Across our six cohorts, 71 percent of 8th graders are observed in the 10^{th} grade data two years hence. The loss can be almost entirely explained by students who are retained or who leave legitimately by dropping out, transferring to the private sector, or moving out of the state. On average, aggregate Fall enrollment of 10^{th} grade students is 6.1 percent smaller than Fall enrollment of the matching 8^{th} grade cohort (authors' calculations based on data from the Texas Education Agency's Academic Excellence Indicator System). This reduction in cohort

We follow six cohorts as they make the transition from middle school campuses in 8th grade to high school campuses in 10th grade as revealed by the school identifiers in the test score documents, beginning with Cohort A (1992-93 8th graders) and ending with Cohort F (1997-98 8th graders). The first three cohorts attended 10th grade under the old admissions regime, while the latter three cohorts attended 10th grade after the new policy had been introduced. The first five cohorts would have chosen their 8th grade schools under the old regime, so that these locations are not endogenous to the policy change. Cohort F began 8th grade in the Fall of 1997, while the new policy was signed by Governor Bush on May 20, 1997 and became effective on September 1, 1997. Thus, this cohort also had little scope or reason to adjust 8th grade campus choices and we also treat these as predetermined.

We rely on the early cohorts to establish the pre-policy 10th grade attendance patterns for 8th graders from each middle school. We then explore how these patterns change for the later cohorts whose transitions are affected by the new policy regime. We analyze three aspects of the high school choice: the threshold for getting into the top-ten percent at the high school attended, the probability of attending the most natural high school given the enrollment patterns of the student's middle school peers, and the probability of choosing an alternative high school that offers the student a high likelihood of placing in the top ten percent. We use variations of difference-in-difference estimation approaches that are based on comparing high school attendance choices before and after the policy change across students with greater and lesser incentives to alter their high school plans in order to guarantee college admission.

4.2 Predicting Students' Ranks and Motives

In order to test how high school attendance choices vary with a student's incentives, we would like to be able to predict a student's class rank at any school the student might attend. 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 third follow-up of 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.[18] 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 class rank percentile is computed based on their senior year transcript data in the second follow-up. We transform the reading and math test scores into percentile ranks on each test,[19] and then regress 12th grade

size consists of dropouts and net flows to the private sector and other states. Due to students dropping out during the 10th grade school year, the number of 10th graders observed in the Spring test documents is 4.5 percent less than Fall enrollment. These two factors combined yield a cohort size reduction of 10.3 percent, giving an upper bound on the share of 8th graders that arrive in 10th grade with their cohort of 89.7 percent. However, not all students in the 10th grade cohort would have been in a Texas public 8th grade two years prior. We find that 4.2 percent of 10th graders were retained once in either the 8th or 9th grade, and the Texas Education Agency reports that in the 1997-98 school year "nearly 10 percent of all 9th graders are students who were not enrolled in TX public schools in the prior year" (http://www.tea.state.tx.us/perfreport/snapshot/98/text/agency.html). These factors cumulatively would predict that only 77 percent of 8th graders should be present in the 10th grade data two years hence. This is an over-estimate since it does not include students who were retained more than one year or 10th graders who were not enrolled in Texas public schools in the prior year. With these additional factors, we are confident that most students are properly tracked.

[18] 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.

[19] Since the TAAS tests have many fewer distinct scores (approximately 65 versus a nearly continuous distribution in the NELS exam scores), we first convert the NELS reading and math aptitude scores to percentile ranks and then downgrade their quality to match the clumpiness of the TAAS scores.

percentile class rank on these test score percentile ranks, 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.

Appendix Table 3 shows the results for the national sample and separately for Texas students. 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. We find that the relative importance of math scores is slightly greater in Texas than in the nation as a whole.

We create a composite test score for each student (which we henceforth call "ability"), which is the weighted average of the student's reading and math percentile scores, with the weights proportional to the coefficients from the Texas results. The reading percentile score receives a weight of 0.314, and the math percentile score is weighted by 0.686.[20] We use the composite score to assign all students to a strict statewide percentile ranking within their 8th grade cohort (r_{is}).

To determine the expected rank for an 8th grader within any given potential 10th grade campus (r_{ik}), we use the distribution of the 8th grade composite scores for actual 10th grade attendees at school k.[21] After mapping composite scores to statewide percentile ranks within their 8th grade cohort for all 10th grade students, we determine the top-ten percent threshold at each high school campus ($Threshold_{kt}$) as the minimum r_{is} among 10th graders within the top decile of school k in year t.

For each 8th grade campus, we then define one high school as the natural choice for students in this 8th grade school. We label this natural choice the "main" high school and define it as the 10th grade school attended by the highest percentage of the 8th graders from a particular middle school. Determination of the main high school is reasonably straightforward for most middle schools.[22] For the median 8th grader, 90 percent of his or her classmates who remain in the Texas public school system attend the main high school. We can then readily determine whether an 8th grader is predicted to be a top-ten percent student at the main high school, given the student's own statewide percentile rank and that school's threshold. We also determine whether the student could place within the top-ten percent at any campus within the same district.

The baseline sample for our analyses of 8th to 10th grade transitions excludes students for whom motives cannot be well-measured. First, for students who (due to retention) show-up in more than one cohort, we keep the student in the most recent cohort. Second, we drop students whose 8th grade campus or main high school is very small, special education, or alternative[23],

[20] The higher relative importance of math scores is consistent with prior studies' findings. For example, using data from the High School and Beyond, Hanushek et al. (1996) find that the weight on the math test score in predicting the probability that sophomores continue in high school to 12th grade is three times greater than the weight on the reading score.

[21] Some students are missing either or both scores. Around 29 percent of 10th graders are missing 8th grade test scores. The rate of missing scores is around 10 percent excluding 10th grade students who were not in a Texas public 8th grade with their cohort, falling from 11.3 percent in 1995 to 8.9 percent in 2000. Students may be missing test scores due to exemptions for limited English proficiency or special education status, to absence or illness on the day of the exam, or for some other idiosyncratic reason. 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 8th and 10th grade administrations and these test scores squared and cubed. If these students' test scores were still missing, we imputed their scores using the average scores for students who were coded with the same reasons for missing or taking the various tests. For 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. Further details of imputation procedures are available from the authors.

[22] For a small number of 8th grade campuses, two or more 10th grade campuses tied as the main campus. In these cases, we determined the main campus by choosing the 10th grade campus with the largest average share across six years.

[23] An 8th grade campus is defined as very small if there are less than 20 students in the 8th grade during any of the six years. The

and students with missing demographic or outcome information. These restrictions reduce the sample by less than five percent. We discuss further sample restrictions below.

5. Empirical Strategies and Results

5.1 Exploratory Distributional Analysis

We begin with exploratory tests of the predictions that come out of the theoretical model regarding the composition of students in the top-ten percent within each high school campus using pooled cross-sectional analysis of our 10th grade cohorts. The distributional results are consistent with, though clearly not proof of, strategic school choice.

As predicted, the average ability level of students who are in the top-ten percent of their high school class increased pre-policy (1995-97) to post-policy (1998-00) from an average statewide percentile rank of 92.85 to 93.29.[24] We would also expect the movers to displace other students who would have been in the top-ten percent of their high school, causing thresholds to rise. Consistent with our prediction, the mean threshold to get into the top-ten percent across high schools increased from a percentile rank of 87.80 (average over the pre-policy years) to 88.35 (average over the post-policy years). Additionally, the standard deviation of thresholds declined from 8.09 to 7.11, which is expected as high ability students become more evenly distributed across high schools.

The above findings are 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 ability distribution. In the pre-policy period, 74.9 percent 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 77.8 percent. Students who are in the third decile of the state distribution have lost representation in the top-ten percent of their high school classes. Figure 2 shows the probability density functions 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 below the 86th percentile of the state distribution, and a gain for students above that point.[25]

These distributional shifts are all consistent with strategic mobility in response to the top-ten percent policy, but are very indirect tests. These shifts could also be the result of an increasing focus on accountability, particularly for poor performing schools.[26] The accountability efforts could have improved the scores of students in poor performing middle schools and thereby produced the outcomes we see in these graphs (i.e., improvements in the test scores of students at formerly poor performing middle schools would make ability appear more evenly distributed,

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campus is defined as a special education campus if more than half of its 8th grade students are special education students. "Alternative" campuses are defined by the Texas Education Agency as campuses that offer nontraditional programs (e.g., juvenile detention centers).

[24] For the distributional analysis in this section, we exclude small, special education, and alternative schools and restrict the sample to those 10th grade campuses that existed for all six cohorts of our data. Campuses are weighted using their average enrollment over this period.

[25] The drop-off in the distribution at the 99th percentile is simply caused by the kernel density estimator not having any observations above the 99th percentile with which to estimate the mass of the distribution at the 99th percentile.

[26] Texas' Senate Bill 7, enacted in 1993, "required that all schools in the state meet state standards for improving performance on [the TAAS]. The standards were to be set not only for average student performance, but for the performance of students characterized by racial group and for that of economically disadvantaged students" (p. 256, Imazeki and Reschovsky, 2004). This accountability system was the model for the federal No Child Left Behind legislation.

without any changes in students' high school enrollment choices). However, the analysis below refutes the hypothesis that all of the distributional changes are due to accountability efforts, and rather supports the contention that strategic enrollment decisions are partially responsible for these changes.

5.2 Threshold at the high school attended

For the first test of strategic transitions, we relate the threshold at the high school the student attends to the student's ability to behave strategically. Students who have convenient opportunities to place in the top-ten percent in a high school should enroll in high schools with lower thresholds after the policy is introduced. Thus, we predict that the threshold at the actual high school attended should fall for these students, while the threshold will actually rise on average for other students since the thresholds will be pushed up by those who enroll strategically.

Define $Post_t$ as an indicator for whether the student attends 10^{th} grade after the policy is implemented. We interact $Post_t$ with a set of dummy variables for student's decile in the Texas statewide ability distribution ($A1_i \ldots A10_i$). We use an ordinary least squares regression to estimate the following baseline specification:

$$(5.1)\quad Threshold_{ikt} = \beta_0 + \beta_1 \times Post_t \times A1_i + \ldots + \beta_{10} \times Post_t \times A10_i + \beta_{11} \times Black_i + \beta_{12} \times Hispanic_i + \beta_{13} \times Poor_i + v_{is} + \varepsilon_{iskt}$$

where $Black_i$, $Hispanic_i$, and $Poor_i$ are indicator variables and the vector v_{is} indicates 8th grade campus × statewide ability decile fixed effects. As discussed above, we anticipate that the coefficients on $Post_t$ will be negative for high-ability students and positive for low-ability students. The identifying assumption for this to be interpretable as a response to the policy change 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 in prior years.

$Threshold_{ikt}$ is defined as the minimum ability level for students in the top-ten percent of the high school attended based on actual enrollment patterns. We alternatively replace $Threshold_{ikt}$ with $Threshold_{iky}$, where y is the first year that the high school is observed. Analysis of the effects on this baseline threshold allows us to observe whether the students are enrolling in schools that would initially be deemed to be "lower-quality" based on baseline student compositions.

For these analyses, we balance the panel by dropping students in 8^{th} grade campuses that do not exist in all cohorts, and we drop students who attended a high school that was very small, special education, or alternative, or who exited the Texas public school system. After doing so, 66 percent of the original sample of 8th grade students remains.

Table 1 contains the regression results. In the first column we assess the effects on the actual threshold of the high schools attended. For every ability group except students in the top decile of the statewide distribution, thresholds increased. The largest increases were experienced for those in the bottom-half of the ability distribution. This result could reflect an influx of strategic movers into the high schools where lower-ability students attend, or it could reflect increased accountability efforts. In the second column we assess changes in thresholds attended holding high schools' thresholds fixed. The results show that students in the top-three deciles moved towards schools with significantly lower thresholds in the baseline year (i.e., moving towards "worse" high schools). Conversely, students in the bottom-half of the ability distribution were more likely to move to schools with higher thresholds (i.e., moving towards "better" high schools) in the post-policy period. The apparent downgrading in school quality by top-ability students is *very* slight on average, lowering the baseline threshold of the high school attended by 0.10 (relative to the pre-policy average threshold of 87.80). If we assume that the behavior of these lower-ability students reflect a secular trend that would have also occurred for higher ability students, then the downgrading for the highest ability students is more pronounced.

In the remainder of the table, we focus on students who have greater opportunities to behave strategically and continue to evaluate the effects on the baseline thresholds. In columns 3, 4, and 5, we restrict the sample to middle schools that have more than one high school within 10 miles, middle schools in districts with more than one high school, and middle schools that "feed" more than one high school.[27] As shown in Appendix Figure 1, 86 percent of students have more than one high school within 10 miles, more than half of Texas middle school students attend middle schools in districts with more than one high school, and roughly a third of students attend middle schools that feed multiple high schools. While such middle schools provide more opportunity for strategic mobility, the results shown in columns 3, 4, and 5 are relatively unchanged from column 2. In the last two columns, we restrict the sample to middle schools that have more than one high school in the district, and feed the same set of 10th grade campuses in all years (column 6), and eliminate 8th grade campuses in catchment areas that ever experience entry or exit of middle schools representing more than 20 percent of enrollment (column 7). The results are essentially unchanged (relative to column 4) when restricting the sample to these more stable schools.

We next focus on students who have stronger opportunities. We begin by creating an indicator variable (Opp_i) that equals one if there is at least one school within the student's local area where the student's own ability is greater than the initial threshold required for being in the top-ten percent of that high school's class. We say a student has "opportunity" to make a strategic move if such an alternative school exists. We define the "local area" parallel to the sample restrictions. For example, when we restrict the sample to middle schools in districts with more than one high school, we define Opp_i as equal to one if the student has a top-ten percent opportunity at one of the high schools in the district.

We then add interactions between the statewide ability and the opportunity indicators and interactions between these and the post-policy indicator to the specification in equation 5.1. We only add these additional interactions for students in the top five statewide ability deciles since essentially no students in the lower half of the ability distribution have top-ten percent opportunities. To demonstrate these results, we have provided Figures 3a-3c, which correspond to the regression results shown in columns 3 through 5 of Table 2. Columns 6 and 7 of Table 2 again show similar results restricting the sample to schools with stable feeding patterns and stable catchment areas.

Figure 3a restricts the sample to students who have more than one high school with 10 miles and defines "opportunity" as having at least one high school within this 10 mile radius that provides a top-ten percent opportunity. We find evidence of modest "downgrading" in the quality of high schools attended by students with opportunity relative to students without opportunity among those students in the top three statewide ability deciles.

In Figure 3b, we show the results with the sample restricted to students in districts with more than one high school (more than half of students attend middle schools in such districts) and with opportunity defined as having a within district opportunity. Here we see more concrete evidence of strategic mobility, with significant downgrading by students in the second through fourth deciles of the statewide ability distribution who have within district opportunities relative to their

[27] A middle school is defined as feeding a high school if at least 10 students (or 10 percent of the class) attend that high school.

same ability counterparts who do not have such opportunities.

Finally, in Figure 3c, we show the results with the sample restricted to students attending middle schools that "feed" multiple high schools and with opportunity defined as having a top-ten percent opportunity for at least one of these high schools. Strategic enrollments in these catchment areas should be associated with relatively low costs, because attendance at one of these high schools likely does not require a change of residence and because students may remain with some of their middle school peers. For students with top-ten percent opportunities in these types of catchment areas, we find clear evidence of strategic mobility. The movement by students in the fourth decile of the statewide ability distribution is particularly strong. Fourth decile students with a top-ten percent opportunity at one of these high schools experienced an average decline in the threshold of the high school they attended by 1.1 points (which is relatively large compared to the standard deviation in thresholds across high schools which was 7.1 points in the post-policy years). Moreover, there was no change in the thresholds of high schools attended by fourth decile students who lacked top-ten percent opportunities at any of these high schools.

Overall, these results show that students with top-ten percent opportunities at local high schools engaged in substantial and statistically significant downgrading in peer quality after the adoption of the top-ten percent policy, whereas students without local top-ten percent opportunities did not.

Next, we test whether these effects differ across various types of students and school districts. The first two columns of Table 3 show estimates based on models which repeat the specification used in column 6 from Table 1 but divide the sample into underrepresented minorities (i.e., black and Hispanic students) and "non-minority" students (mostly consisting of white students). For non-minority students, we find significant (but modest) downgrading among students in the top decile of the statewide ability distribution who have a top-ten percent opportunity within their district. For minority students with such opportunities, we find statistically significant and substantial downgrading among the top, third, and fourth deciles. These results might be due to the fact that high-ability minority students view the top-ten percent policy as their main route to admissions given the elimination of affirmative action. Long and Tienda (2008) find little change in the class rank distribution of white and Asian applicants to UT-Austin through 2003, but a large increase in the share of black and Hispanic applicants who were in the top-ten percent of their high school classes.

In the next two columns of Table 3, we repeat this analysis splitting students by family poverty status. After the policy change, students with top-ten percent opportunities within their districts attend schools with lower initial thresholds, regardless of their family's poverty status. Among students from families that are not low-income, students in the top and third highest statewide ability deciles have statistically significant declines in their high schools' initial thresholds. Among students from low-income families, students in the top and fourth highest statewide ability deciles have statistically significant declines in their high schools' thresholds. The opportunistic downgrading behavior is generally larger in magnitude for students from low-income families than other students, though these differential responses are not statistically significant.

Finally, in the last two columns of Table 3, we split the sample by whether the student attended a middle school whose main high school sent more than 2.5 percent of its 10th graders to UT-Austin.[28] Parents at such "UT-feeder" schools have been some of the most vocal critics of the crowd-out effect of the top-ten percent policy. We find evidence consistent with strategic mobility for students at both UT-feeder and other high schools. There is downgrading of initial high school thresholds for all students with top-ten percent opportunities, except for relatively low ability students who do not attend schools traditionally feeding UT-Austin. Interestingly, there is evidence of strategic mobility for the highest ability students outside of UT-feeder areas but significantly less mobility among the highest ability students in UT-feeder areas. There are several potential explanations for this finding. High ability students typically attending UT-feeder schools may be much more confident in their ability to gain admittance to the selective universities regardless of their top-ten percent status. There also might be greater variance in high school top-ten percent thresholds in areas not typically associated with feeding UT-Austin, so students strategically following their top-ten percent opportunities there experience greater drops in peer quality.

5.3 High school choice

The second test of strategic enrollment decisions draws more directly on the model of high school choice derived in the theoretical section. Having found the greatest evidence of trading down behavior among students with multiple local high school options in our reduced-form analysis of high school thresholds, we restrict out attention to students in districts served by more than one high school. Treating each district as a distinct market and pooling across markets, we model the choice of which high school to attend using a conditional logit approach. Students are presumed to choose the school that yields the highest utility, and this utility is allowed to depend on school-specific factors such as distance from the middle school, student composition, and, most importantly, whether the school offers the student a top-ten percent opportunity.[29] This more structural approach will allow us to simulate policy-induced changes in school enrollment shares and in the composition of students with automatic guarantees, as well as how any effects are moderated by student and school characteristics.

[*RESULTS FORTHCOMING*].

5.4 Effect of strategic mobility on the composition of students in the top-10 percent

The net effect of this strategic mobility could either increase or decrease minority students' and low-income students' shares of those who are top-ten percent eligible, depending on these students' degrees of motivation relative to other students and their relative responsiveness to the policy's incentives. As a temporary substitute for the forthcoming findings from the discrete choice analysis, Table 6 provides suggestive evidence regarding whether strategic mobility increased or decreased minority and poor students' share of top-ten percent students. We report the characteristics of the students who were likely in the top-ten percent of: (1) the statewide test-score distribution, (2) their main 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 main high school and the high school that they actually attended. This

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[28] In Appendix Figure 2 we show that the districts that send a high share of their 10th graders to UT-Austin are distributed widely across the state, but there are notably high rates from the suburbs of Dallas, Houston, and Austin.

[29] Note that our specifications include high school fixed effects which allows more flexible substitution patterns and helps account for differences in the ease of intra-district choice across districts.

result is similar to the results found in Long (2004) when looking at a national sample in 1992, and it suggests that the recipients of automatic admission will be disproportionately white, Asian, and non-poor.[30]

A rough test of the effects of mobility on the composition of each high school's top-ten percent can be achieved by comparing the difference between the characteristics of the students in their main and actual high schools, pre- and post-policy reform. The difference between the characteristics of the students in their main and actual high schools reveals 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 (0.65 percent) at the schools where these students actually attend than at their main high schools. This difference remained exactly the same in the post-policy years. The same result is essentially found for blacks and Hispanics as well. Thus, based on this rough evidence, students' strategic enrollment decisions had no effect on the racial composition of those eligible for automatic admission. Strategic mobility may have raised the share of low-income students in the top-ten percent by 0.26 percentage points, but this change is not statistically significant. While the policy has led to a diffusion of the most able students across campuses, it has not radically altered the demographic composition of students in the top decile of their high schools.

6. Conclusions

Texas' 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 policy encourages strategic high school enrollment that might change the composition of the eligible population and more generally reduce the degree of sorting by ability across high schools.

We find evidence that some students and families did change their behavior in a strategic manner after the policy was instituted. After the policy change, students with strong chances of placing in the top-ten percent at nearby high schools tended to "downgrade" in peer quality by attending high schools with lower initial top-ten percent thresholds. In preliminary results not shown here, we also find that students became more likely to remain at their "main" high school, the high school most frequently attended by graduates of their middle school, if doing so afforded them the opportunity to place in the top ten percent. This strategic mobility changed the composition of beneficiaries of the new program, raising both the average ability level of these qualifiers and the average high school thresholds for qualification.

We have almost certainly underestimated the share responding strategically to the policy since we consider only a subset of students with incentives to downgrade. We conducted a simulation to see how many students would need to behave strategically to produce the observed increase in high school's thresholds. We moved students to their main high school one-at-a-time

[30] 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 the set of students who have a high class rank, but low test scores (i.e., those likely to gain admission by the new program) is disproportionately black and Hispanic.

for those who met the following qualifications: a) attended a public Texas high school in the pre-policy years, b) did not attend their main high school, and c) would be in the top-ten percent of their main school. Following this procedure required moving 4,480 students (or nearly 1,500 per year) to produce the observed change in thresholds. This is estimate is likely an upper bound as it does not account for the effects of accountability efforts, which likely raised thresholds at formerly poor performing schools.

Nonetheless, the response to the program in more recent years is likely to be much greater than we estimate here, as students face increasingly difficult prospects for gaining admission to the flagships and students from more high schools participate in the program. However, unlike behavioral responses in other settings, there is a natural moderating tendency in the longer run as thresholds converge.

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Table 1
Effects of the Top-10% Policy on the Threshold of High School Attended, by Student Ability

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Actual Threshold $_{ikt}$	*Baseline Threshold* $_{ikt}$					
Post * Top-Decile	-0.028	-0.101	-0.103	-0.130	-0.169	-0.073	-0.093
	[0.067]	[0.026***]	[0.029***]	[0.041***]	[0.090*]	[0.040*]	[0.035***]
Post * 2nd Decile	0.126	-0.062	-0.064	-0.095	-0.132	-0.051	-0.080
	[0.075*]	[0.029**]	[0.034*]	[0.051*]	[0.107]	[0.053]	[0.048]
Post * 3rd Decile	0.237	-0.055	-0.064	-0.085	-0.111	-0.077	-0.091
	[0.083***]	[0.026**]	[0.030**]	[0.044*]	[0.084]	[0.045*]	[0.045**]
Post * 4th Decile	0.389	-0.010	-0.009	-0.010	-0.077	0.002	-0.017
	[0.092***]	[0.028]	[0.032]	[0.049]	[0.097]	[0.05]	[0.051]
Post * 5th Decile	0.497	-0.037	-0.042	-0.052	-0.012	-0.029	-0.029
	[0.099***]	[0.03]	[0.034]	[0.051]	[0.089]	[0.051]	[0.053]
Post * 6th Decile	0.741	0.106	0.122	0.174	0.235	0.194	0.192
	[0.106***]	[0.031***]	[0.036***]	[0.054***]	[0.093**]	[0.052***]	[0.054***]
Post * 7th Decile	0.872	0.099	0.112	0.157	0.205	0.164	0.164
	[0.117***]	[0.034***]	[0.038***]	[0.055***]	[0.095**]	[0.055***]	[0.056***]
Post * 8th Decile	0.932	0.060	0.078	0.091	0.100	0.102	0.110
	[0.129***]	[0.043]	[0.048]	[0.069]	[0.12]	[0.066]	[0.068]
Post * 9th Decile	1.032	0.044	0.051	0.091	-0.009	0.114	0.119
	[0.145***]	[0.044]	[0.05]	[0.069]	[0.109]	[0.067*]	[0.068*]
Post * Bottom Decile	0.853	0.035	0.045	0.045	0.082	0.071	0.068
	[0.148***]	[0.044]	[0.051]	[0.076]	[0.117]	[0.076]	[0.078]
Observations	1,047,935	1,047,935	904,993	570,584	223,115	467,560	449,988
Sample Restriction	None	None	More than one HS within 10 miles	More than one HS in district	Middle school feeds more than one HS	More than one HS in district, and stable feeder patterns	More than one HS in district, stable feeder patterns, and stable catchment areas.

Specifications includes indicators for black, Hispanic, and poor, and 8th grade campus * statewide ability decile fixed effects. Full regression results are available from the authors. Robust standard errors clustered at the 8th grade campus * ability decile level are in parentheses below the coefficients. Significance: *** if pr<=1%, ** if pr<=5%, * if pr<=10%.

Table 2
Effects of the Top-10% Policy on the (Initial) Threshold of High School Attended, by Student Ability and Opportunity

	(3)	(4)	(5)	(6)	(7)
Post * Top-10% * Has Nearby Opp.	-0.128	-0.124	-0.114	-0.129	-0.159
	[0.051**]	[0.053**]	[0.171]	[0.056**]	[0.053***]
Post * 2nd Decile * Has Nearby Opp.	-0.139	-0.183	-0.313	-0.187	-0.251
	[0.055**]	[0.105*]	[0.223]	[0.110*]	[0.099**]
Post * 3rd Decile * Has Nearby Opp.	-0.162	-0.318	-0.503	-0.393	-0.435
	[0.061***]	[0.129**]	[0.289*]	[0.143***]	[0.137***]
Post * 4th Decile * Has Nearby Opp.	-0.074	-0.357	-1.077	-0.335	-0.383
	[0.079]	[0.178**]	[0.413***]	[0.196*]	[0.190**]
Post * 5th Decile * Has Nearby Opp.	0.360	0.383	0.594	0.272	0.268
	[0.222]	[0.362]	[1.608]	[0.383]	[0.392]
Post * Top-10%	0.022	-0.019	-0.063	0.043	0.049
	[0.043]	[0.04]	[0.198]	[0.037]	[0.039]
Post * 2nd Decile	0.030	-0.007	-0.008	0.039	0.042
	[0.029]	[0.032]	[0.125]	[0.028]	[0.03]
Post * 3rd Decile	0.013	0.007	-0.009	0.037	0.038
	[0.023]	[0.031]	[0.073]	[0.027]	[0.029]
Post * 4th Decile	0.015	0.057	0.013	0.069	0.061
	[0.03]	[0.042]	[0.093]	[0.037*]	[0.038]
Post * 5th Decile	-0.060	-0.071	-0.014	-0.044	-0.045
	[0.033*]	[0.049]	[0.09]	[0.048]	[0.049]
Observations	904,993	570,584	223,115	467,560	449,988
Sample Restriction	More than one HS within 10 miles	More than one HS in district	Middle school feeds more than one HS	More than one HS in district, and stable feeder patterns	More than one HS in district, stable feeder patterns, and stable catchment areas.

Specifications includes ability decile indicators interacted with post for ability deciles 6 to 10; ability decile indicators interacted with "has nearby opportunity" for deciles 1 to 5; indicators for black, Hispanic, and poor; and 8th grade campus * ability decile fixed effects. Full regression results are available from the authors. Robust standard errors clustered at the 8th grade campus * ability decile level are in parentheses below the coeficients. Significance: *** if pr<=1%, ** if pr<=5%, * if pr<=10%.

Table 3

Effects of the Top-10% Policy on the (Initial) Threshold of High School Attended, by Student Ability, Opportunity, and Race, Poverty Status, or Whether Main High School is a Substantial Feeder to UT-Austin

	Non-Minority	Minority	Non-Poor	Poor	UT Feeder	Non UT Feeder
	(4)	(4)	(4)	(4)	(4)	(4)
Post * Top-10% * Has Nearby Opp.	-0.103	-0.478	-0.123	-0.414	-0.057	-0.309
	[0.042**]	[0.237**]	[0.050**]	[0.246*]	[0.064]	[0.086***]
Post * 2nd Decile * Has Nearby Opp.	-0.086	-0.294	-0.153	-0.164	-0.320	-0.038
	[0.083]	[0.189]	[0.097]	[0.234]	[0.183*]	[0.127]
Post * 3rd Decile * Has Nearby Opp.	-0.160	-0.356	-0.280	-0.315	-0.263	-0.382
	[0.156]	[0.169**]	[0.147*]	[0.203]	[0.237]	[0.150**]
Post * 4th Decile * Has Nearby Opp.	-0.094	-0.441	-0.085	-0.477	-0.450	-0.296
	[0.218]	[0.207**]	[0.248]	[0.221**]	[0.574]	[0.169*]
Post * 5th Decile * Has Nearby Opp.	-0.059	0.413	0.220	0.767	-0.829	0.827
	[0.395]	[0.394]	[0.421]	[0.51]	[0.605]	[0.373**]
Post * Top-10%	-0.002	0.202	0.006	0.109	-0.007	0.082
	[0.033]	[0.205]	[0.036]	[0.196]	[0.044]	[0.065]
Post * 2nd Decile	-0.024	-0.009	-0.003	-0.055	0.055	-0.078
	[0.03]	[0.091]	[0.029]	[0.117]	[0.04]	[0.048]
Post * 3rd Decile	-0.006	-0.003	0.005	0.013	0.041	0.025
	[0.03]	[0.066]	[0.031]	[0.084]	[0.036]	[0.045]
Post * 4th Decile	-0.027	0.149	0.019	0.120	0.049	0.077
	[0.035]	[0.086*]	[0.039]	[0.097]	[0.049]	[0.066]
Post * 5th Decile	-0.068	-0.060	-0.022	-0.143	-0.062	-0.046
	[0.042]	[0.081]	[0.046]	[0.098]	[0.06]	[0.068]
Observations	275,430	295,154	358,006	212,578	217,161	353,423
Sample Restriction	More than one HS in district	More than one HS in district	Middle school feeds more than one high school	Middle school feeds more than one high school	Middle school feeds more than one high school	Middle school feeds more than one high school

Specifications includes ability decile indicators interacted with post for ability deciles 6 to 10; ability decile indicators interacted with "has nearby opportunity" for deciles 1 to 5; indicators for black, Hispanic, and poor (where appropriate); and 8th grade campus * ability decile fixed effects. Full regression results are available from the authors. Robust standard errors clustered at the 8th grade campus * ability decile level are in parentheses below the coeficients. Significance: *** if pr<=1%, ** if pr<=5%, * if pr<=10%.

Table 6
Effect of 8th to 10th Grade Mobility on Characteristics of Students in the Top-10% of Attended High School

	Pre-Policy Cohorts: 1993-95, 1994-96, 1995-97					Post-Policy Cohorts: 1996-98, 1997-99, 1998-00					
	1	2	3	4	*4-3*	6	7	8	9	*9-8*	***(9-8) - (4-3)***
Group	Whole State	Top-10% in State	Top-10% at Main HS	Top-10% at Actual HS	*Difference (=Effect of 8th to 10th Grade Mobility)*	Whole State	Top-10% in State	Top-10% at Main HS	Top-10% at Actual HS	*Difference (=Effect of 8th to 10th Grade Mobility)*	***Diff-in-Diff (=Effect of Strategic Mobility)***
"White" Share	51.4%	85.4%	71.9%	72.5%	*0.65%*	49.6%	80.6%	69.0%	69.7%	*0.65%*	***0.00%***
Black Share	14.3%	3.0%	6.0%	5.7%	*-0.38%*	13.9%	4.0%	6.7%	6.4%	*-0.37%*	***0.01%***
Hispanic Share	34.3%	11.6%	22.1%	21.8%	*-0.27%*	36.5%	15.3%	24.3%	24.0%	*-0.29%*	***-0.02%***
Non-Poor Share	60.7%	89.2%	80.3%	80.1%	*-0.19%*	56.5%	85.0%	75.8%	75.9%	*0.07%*	***0.26%***
Poor Share	39.3%	10.8%	19.7%	19.9%	*0.19%*	43.5%	15.0%	24.2%	24.1%	*-0.07%*	***-0.26%***

Note: "White" is defined as not black and not Hispanic.

Figure 1: Motivation for Strategic Enrollment Choices

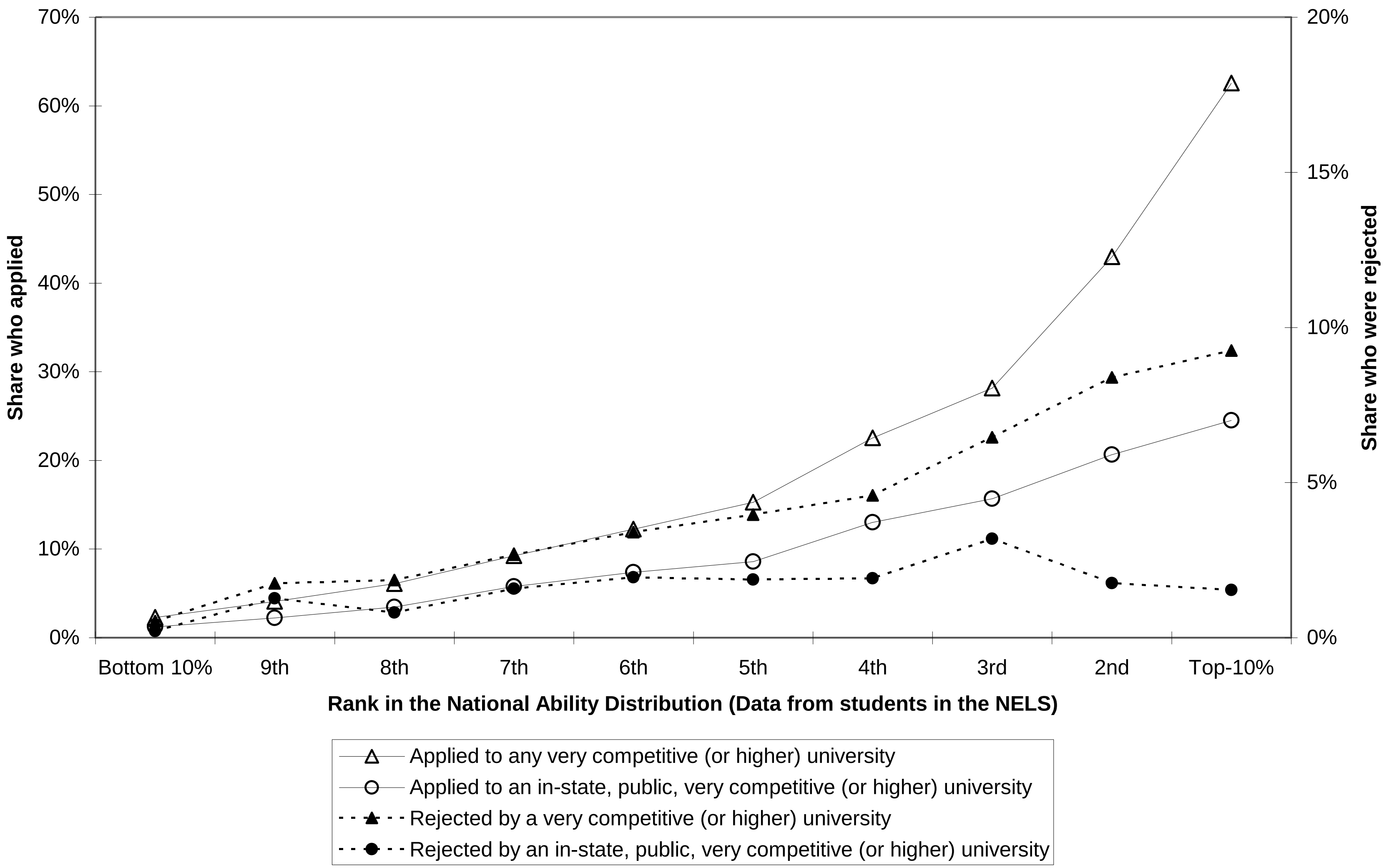


Figure 2
Distribution of Students in the Top-10% of Own High School Class by Percentile in the Texas State Distribution of Test Scores, 1995-97 Average Versus 1998-2000 Average

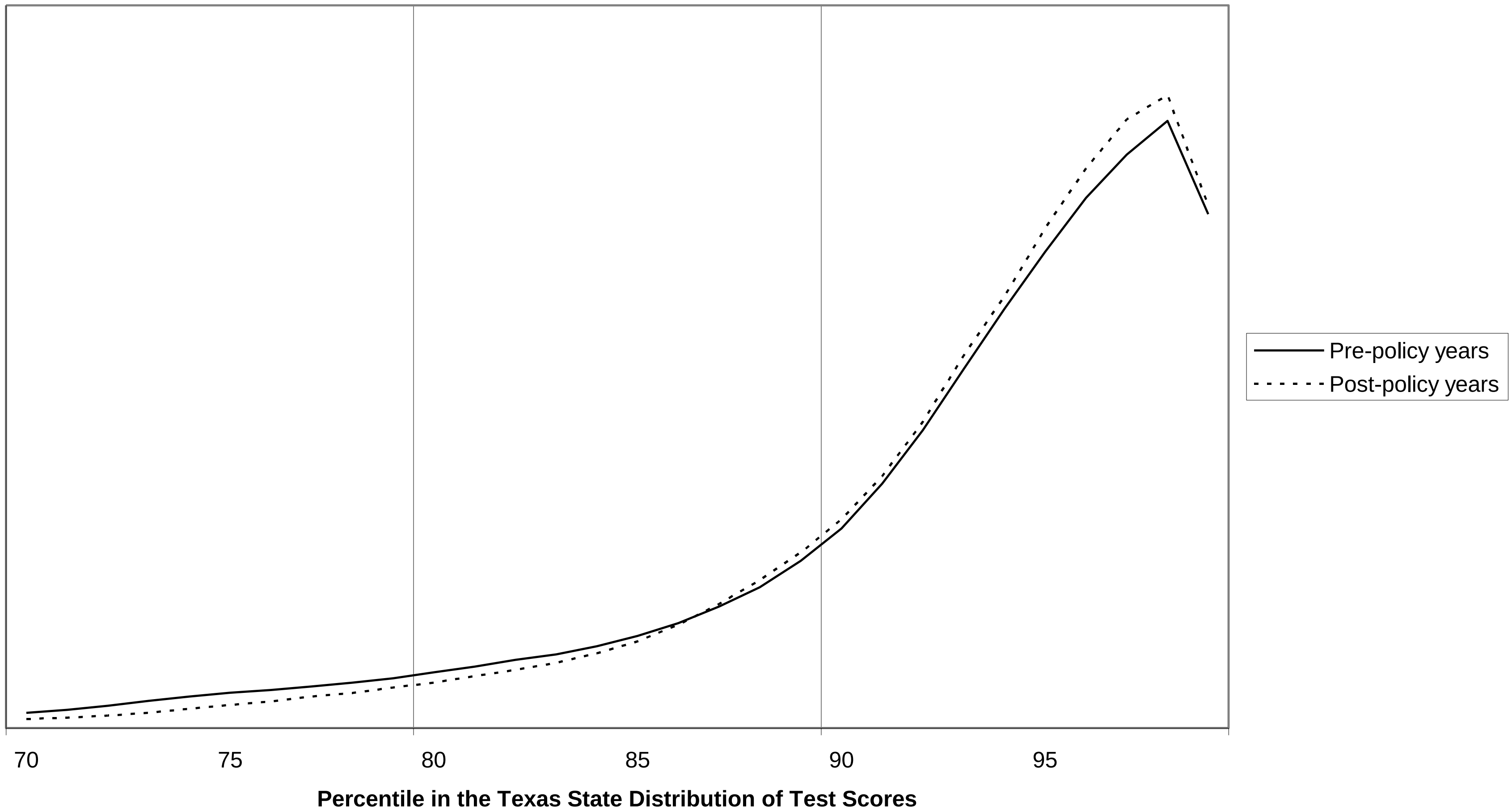


Figure 3a: Effect of the Top-10% Policy on the Baseline Threshold of the High School Attended, by Student's Ability and Opportunity at a HS Within 30 Miles
(Sample restricted to middle schools with more than one high school within 30 miles)

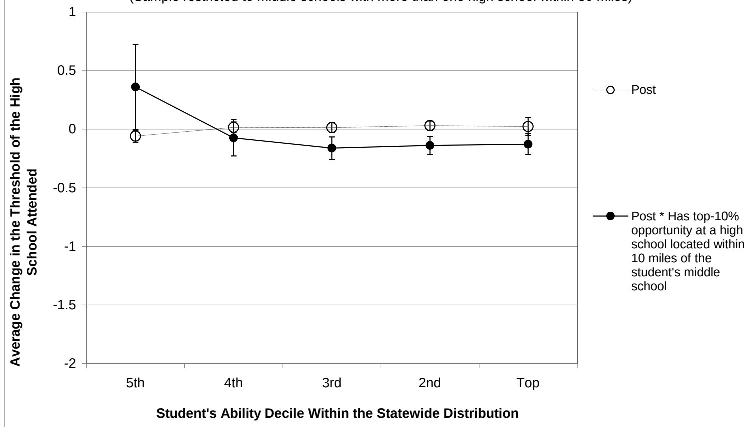


Figure 3b: Effect of the Top-10% Policy on the Baseline Threshold of the High School Attended, by Student's Ability and Opportunity at a HS Within the District
(Sample restricted to middle schools with more than one high school within the district)

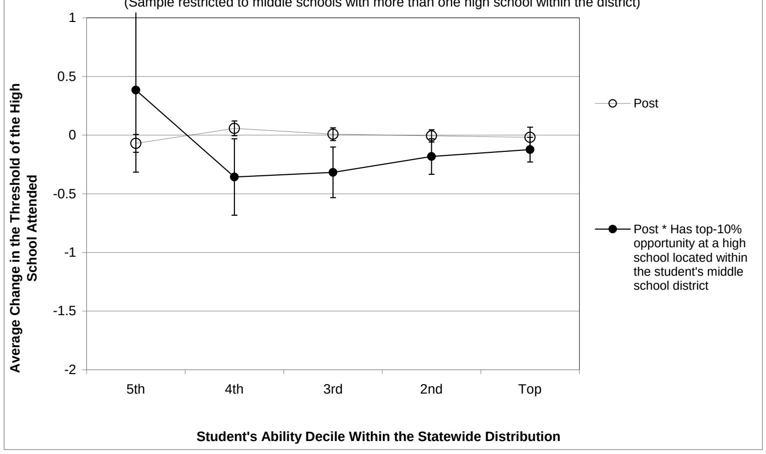
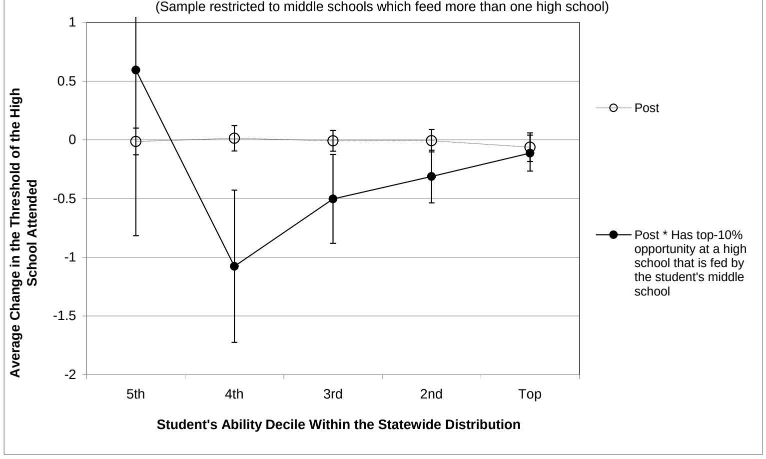


Figure 3c: Effect of the Top-10% Policy on the Baseline Threshold of the High School Attended, by Student's Ability and Opportunity at a HS Fed by the Middle School
(Sample restricted to middle schools which feed more than one high school)



Appendix 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 Comp.	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 U.	Top 10%	Competitive	3538	81%	22	465	545	43%	78%
U. of North Texas	Top 10%	Competitive	2583	74%	N/A	N/A	N/A	26%	36%
Southwest Texas State U.	Top 10%	Competitive	2533	65%	22	458	513	48%	86%
U. 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%
Texas A&M- Galveston	Top 10%	Less Comp.	N/A	87%	N/A	N/A	N/A	N/A	N/A
U. of Texas- Arlington	Top 10%	Less Comp.	1648	91%	21	420	500	40%	70%
Prairie View A&M U.	Top 10%	Noncomp.	1069	99%	N/A	N/A	N/A	N/A	N/A
Stephen F. Austin State U.	Top 25%	Competitive	1855	74%	20	486	491	N/A	N/A
Sam Houston State U.	Top 25%	Competitive	1638	77%	N/A	N/A	N/A	41%	N/A
Texas A&M- Commerce	Top 25%	Competitive	720	64%	21	430	474	N/A	N/A
Midwestern State U.	Top 25%	Less Comp.	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tarleton State U.	Top 25%	Less Comp.	1057	91%	N/A	484	490	26%	56%
Texas Women's U.	Top 25%	Less Comp.	431	79%	N/A	N/A	N/A	N/A	N/A
U. of Texas- Pan American	Top 25%	Noncomp.	2143	100%	17	N/A	N/A	N/A	N/A
Angelo State U.	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%
Lamar U.	Top 50%	Less Comp.	3150	86%	N/A	488	477	N/A	N/A
U. of Texas- El Paso	Top 50%	Less Comp.	1908	81%	N/A	N/A	N/A	N/A	N/A
Sul Ross State U.	Top 50%	Noncomp.	428	83%	17	350	400	14%	36%
Texas Southern U.	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%
U of Houston- Downtown	Open	Noncomp.	1866	100%	N/A	N/A	N/A	N/A	N/A

Other Small Satellites: Top 10%: Texas A&M- Corpus Christi, U. of Texas- Tyler; Top 25%: U. of Texas- Permian Basin; Top 50%: Texas A&M- International; Open: U. of Texas- Brownsville

Sources: "Admissions Selectivity" data are from Barron's Profiles of American Colleges, 21st Edition. "Automatic Admissions Rules Used in 2002-03" were compiled from the universities' web sites on October 18, 2002. At some universities, students who do not meet the automatic admissions criteria may be automatically admitted if they are above a lower class rank threshold and have sufficient test scores or attend specific courses.

Appendix Table 2

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

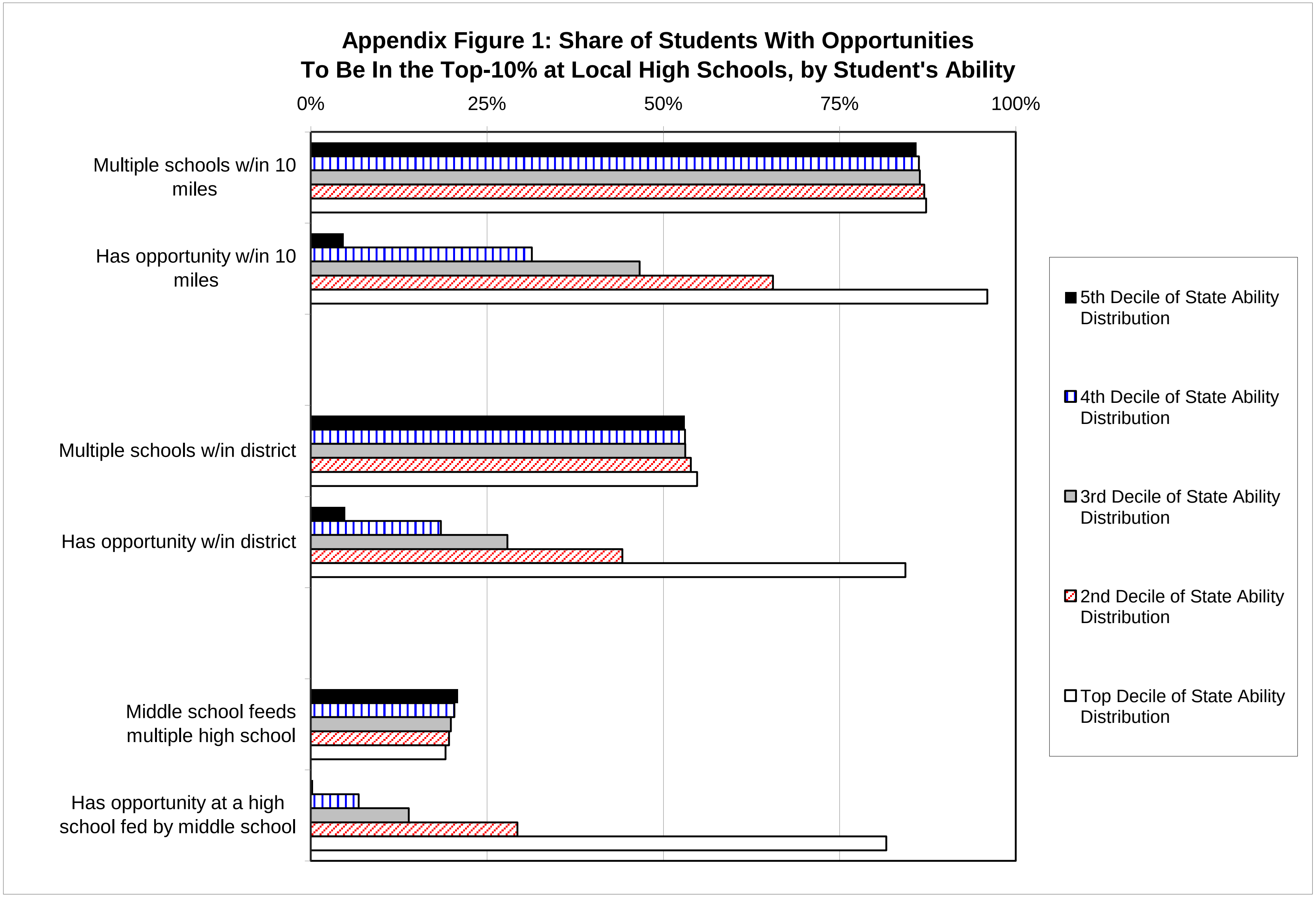
University	Automatic Admissions Rule Used in 2002-03	Total Enrollment	Total In-State Enrollment	Enrollment of Top 10% Students	
				Total	As Percent of Statewide Top 10% Enrolled
STATE TOTALS	-	*52,666*	*46,611*	*11,747*	*100.0%*
U. of Texas- Austin	Top 10%	7,684	7,074	3,415	29.1%
Texas A&M	Top 10%	6,685	6,305	3,226	27.5%
Texas Tech U.	Top 10%	4,106	3,793	821	7.0%
U. of Houston	Top 10%	3,135	2,963	630	5.4%
U. of North Texas	Top 10%	2,969	2,698	426	3.6%
Southwest Texas State U.	Top 10%	2,625	2,028	217	1.8%
U. of Texas- San Antonio	Top 10%	1,828	1,782	217	1.8%
U. of Texas- Arlington	Top 10%	1,685	1,602	337	2.9%
Prairie View A&M U.	Top 10%	1,346	404	61	0.5%
Texas A&M- Corpus Christi	Top 10%	851	810	146	1.2%
U. of Texas- Dallas	Top 10%	840	625	148	1.3%
Texas A&M- Galveston	Top 10%	428	335	55	0.5%
U. of Texas- Tyler	Top 10%	178	169	63	0.5%
Stephen F. Austin State U.	Top 25%	2,274	2,229	296	2.5%
U. of Texas- Pan American	Top 25%	2,083	1,146	0	0.0%
Sam Houston State U.	Top 25%	1,713	1,682	0	0.0%
Midwestern State U.	Top 25%	847	647	28	0.2%
Tarleton State U.	Top 25%	745	681	69	0.6%
Texas A&M- Commerce	Top 25%	624	476	49	0.4%
Texas Women's U.	Top 25%	431	369	62	0.5%
U. of Texas- Permian Basin	Top 25%	150	142	25	0.2%
U. of Texas- El Paso	Top 50%	2,238	1,863	244	2.1%
Angelo State U.	Top 50%	1,287	1,132	164	1.4%
Lamar U.	Top 50%	1,218	1,044	111	0.9%
West Texas A&M	Top 50%	901	619	138	1.2%
Texas A&M- International	Top 50%	317	238	52	0.4%
Sul Ross State U.	Top 50%	268	230	8	0.1%
Texas Southern U.	Open	1,090	917	83	0.7%
Texas A&M- Kingsville	Open	990	960	128	1.1%
U. of Houston- Downtown	Open	988	773	0	0.0%
U. of Texas- Brownsville	Open	142	101	0	0.0%

Sources: Enrollment and Admission data are from Texas Higher Education Coordinating Board (2002). "Automatic Admissions Rules Used in 2002-03" were compiled from the universities' web sites on October 18, 2002.

Appendix Table 3
High School Class Rank Estimated Using 8th Grade Reading and Math Test Scores

	National		Texas	
Percentile on 8th Grade Reading Test	0.251	***	0.226	***
	(0.013)		(0.047)	
Percentile on 8th Grade Math Test	0.466	***	0.493	***
	(0.014)		(0.043)	
Observations	10,918		787	
R^2	0.361		0.384	

Specification includes school fixed effects.
Regressions are weighted by the NELS panel weight, "f2pnlwt".
Standard errors are in parentheses below the coefficients.
Significance: *** if pr<=1%, ** if pr<=5%, * if pr<=10%.
Data from the National Education Longitudinal Study.



Appendix Figure 1: Share of Students With Opportunities
To Be In the Top-10% at Local High Schools, by Student's Ability
0%
25%
50%
75%
100%
Multiple schools w/in 10 miles
Has opportunity w/in 10 miles
Multiple schools w/in district
Has opportunity w/in district
Middle school feeds multiple high school
Has opportunity at a high school fed by middle school
5th Decile of State Ability Distribution
4th Decile of State Ability Distribution
3rd Decile of State Ability Distribution
2nd Decile of State Ability Distribution
Top Decile of State Ability Distribution

Appendix Figure 2:
The Percentage of Texas 10th graders who Attend UT-Austin 2 years Later, Mean District-level Percentages for the High School Classes of 1996 through 2000