Winners and Losers?
The Effect of Gaining and Losing Access to Selective Colleges on Education and Labor Market Outcomes

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Abstract

College admissions processes are fundamentally a question of tradeoffs: given capacity, admitting one student means rejecting another. Research to date has generally estimated average effects of college selectivity, and has been unable to distinguish between the gains to students gaining access and the losses to students losing access. We use the introduction of the Top Ten Percent Rule and administrative data from the state of Texas to estimate the effect of access to a selective college on student graduation and earnings outcomes. Notably, we separately estimate the effects for students who gain and lose access due to the policy. We find that students who gain access to the University of Texas at Austin see increases in college enrollment and graduation with some evidence of positive earnings gains 7-9 years after college. In contrast, students who lose access do not see declines in overall college enrollment, graduation, or earnings.

1. Introduction

Selective college admissions processes are fundamentally a question of tradeoffs: given capacity, admitting one student means rejecting another. To understand these tradeoffs, it is important to understand not just what are the benefits of attending a selective institution but also who benefits the most from access to a selective college. There is an extensive literature examining the returns to attending a more selective institution, with recent work finding significant benefits to students of attending higher quality colleges. (Cohodes and Goodman 2014, Hoekstra 2009, Zimmerman 2014, Goodman et al. 2017, Ge et al. 2018). However, these studies generally estimate average effects and so do not answer the policy relevant question of *which* students benefit most from access.

For many purposes, enrollment at selective institutions is a zero-sum game, as each additional student from one group that is enrolled displaces a marginal student from another group. Many recent debates, including challenges to the use of affirmative action (e.g., Fisher v. University of Texas) or to consideration of non-academic factors (as in the recent lawsuit over Harvard admissions, or in the adoption of "SAT optional" policies) turn explicitly on the fact that admissions rules that benefit one group of students necessarily displace another. Assessing an admissions policy change requires understanding both the effect of attending the selective college on the students admitted under the policy and the effect on those students who are displaced.

In this paper, we take advantage of the introduction of the Texas Top Ten Percent rule (hereafter, "TTP") to identify the effects of access to more selective public universities on student short- and long-run success in a particularly policy-relevant setting. We draw on administrative data covering the entire state of Texas that tracks students from high school through college and into the labor market, allowing us to measure impacts on enrollment, graduation, and post-college labor market outcomes up to 15 years after high school graduation.

We develop machine learning strategies for identifying students who gained and lost access to the most selective University of Texas campuses under TTP. Prior to TTPs implementation in 1998, students were admitted separately at each University of Texas campus based on a combination of class rank, test scores, and other factors such as the student's personal statement. Before the entering class of 1997, Universities also engaged in affirmative action. With TTP, all

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students whose grades placed them in their school's top decile were guaranteed admission even to the most selective campuses.[1] Admission to the flagship universities was now based on relative performance within high school as opposed to absolute performance, increasing opportunities most for those students from the most disadvantaged high schools. We use the introduction of TTP to identify the effect of access to a selective institution on students, many from disadvantaged backgrounds, who were previously unlikely to attend selective institutions.

Importantly, and in contrast to other work on college selectivity, we identify the effect on access to a more selective university for both students who gained access as well as students who *lost* access as a result of the policy. Accommodating the new TTP students required tightening admissions standards on other margins, leading some students who would have previously attended a selective Texas university to be denied admission. We estimate the effect of TTP on two distinct types of marginal students. The first group, with relatively high performance at schools that had traditionally sent few if any students to the University of Texas flagship campus in Austin (hereafter referred to as "UT Austin"), became more likely to attend UT Austin. We refer to these students, the nominal target of TTP, as "Pulled In" by the policy. The second group of students, who were ranked outside of the top 10 percent at high schools that had previously sent a relatively large share of their students to UT, became less likely to attend. We refer to these students as "Pushed Out" by TTP.

The Pulled In students had higher test scores, took more AP classes, and had fewer absences than Pushed Out students, but they came from schools with above-average shares of underrepresented minorities and low-income students, while Pushed Out students' schools were more advantaged than average. The Pulled In students were also individually more racially diverse than either Pushed Out students or the average UT student, however, they were less racially diverse than the Texas school population as a whole. We view the ability to examine both groups of students as an important contribution; knowing effects on both margins informs policy so that any benefits to new enrollees can be weighed against the costs to the displaced students. [2] Many admissions policy controversies concern efforts to draw in relatively successful students from non-traditional backgrounds, so create tradeoffs like the one we study.

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[1] Other states, including California and Florida have since implemented similar policies.

[2] Kapor (2015) develops a structural model of college attendance and completion and uses data from the Texas Higher Education Opportunity Project (THEOP), combining surveys of a sample of high Texas school students beginning in 2002 and administrative admissions and enrollment data for nine colleges and universities in Texas, to

A key challenge for our analysis is that data on class rank was not systematically collected prior to the implementation of TTP. Thus, although the TTP would seem to lend itself naturally to a regression discontinuity strategy (as in Hoekstra 2009, which uses a test score cutoff, and Daugherty et al. 2014, Bleemer 2019), data limitations make this infeasible. Instead, we use a pair of difference-in-differences designs based on imputed top-10% status. We use data on post-TTP students, for whom we observe eligibility for TTP admissions, to train a random forest prediction of top-10% status, then use this prediction model to impute top-10% status in all years. Using this imputation, we can identify both a group of students who are highly likely to be eligible for TTP admission and a second group of still-high-achieving students for whom this is less likely. We combine this with characteristics of high schools prior to the implementation of the top 10% plan in order to classify students into our two treatment groups. We then compare changes in each group's enrollment, graduation, and labor market outcomes surrounding the implementation of the TTP with those of a control group unlikely to have been affected by TTP.

As noted earlier, we contribute to the substantial literature on the returns to college quality in higher education. The research to date suggests that college quality has positive effects on student success, although this conclusion is not unanimous. Dale and Krueger (2002, 2014), estimate the effect of attending a more selective college based on comparisons of students who made different matriculation decisions within similar choice sets. They find little effect of selectivity on average, though the (small) subsample of black students did appear to benefit. Ge et al. (2018) update Dale and Krueger and find benefits for female students using different sample selection criteria. A series of more recent studies using regression discontinuity designs generally find that more selective colleges raise graduation and earnings. Several of these studies (e.g., Hoekstra 2009; Goodman, Hurwitz, and Smith 2017) are based on admissions discontinuities, so identify effects on marginally admitted students given the existing admissions rule. Perhaps most similar to our setting, Bleemer (2019) compares students who just qualify and just miss the threshold for the University of California's "Eligibility in the Local Context" admissions rule (aka the "four percent plan"), showing that gaining access to more selective campuses benefits students. Cohodes and Goodman (2014) obtain similar results in their study of

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estimate the effect of TTP on college enrollment and academic performance. He concludes that the Texas Top 10 Percent plan increased minority enrollment at flagship universities, and that minority students admitted under TTP achieved higher college GPAs than minority students admitted under a points-based affirmative action policy would have achieved.

a Massachusetts merit aid program where identification comes from students who are especially price sensitive but not necessarily near the admissions margin. Finally, Daugherty, Martorell, and McFarlin (2014) use data from a single urban Texas school district to implement a regression discontinuity research design that compares students with class rank just above and below the top ten percent cut-off. Daugherty, et al. (2014) find that eligibility for guaranteed admissions increases enrollment at Texas flagship universities as well as the number of semesters enrolled. They also find that the effects are concentrated in schools with high college-sending rates, concluding that these automatic admission plans may have little effect on students in the most disadvantaged schools.

A key issue in this literature is that the effects of college quality are likely heterogeneous, perhaps different for marginal students than for average students and perhaps even varying across different admission margins. The above studies have limited ability to identify heterogeneous effects, and especially contrasts between different admissions margins. A parallel literature on "mismatch" effects (e.g., Rothstein and Yoon 2008; Sander 2012); Dillon and Smith 2017; Arcidiacono et al., 2016) explicitly emphasizes potential heterogeneity. These studies test for potentially negative effects of selectivity on students admitted due to affirmative action preferences, with decidedly mixed results. A presumption in this literature is that students at the traditional admissions margin – those who would be admitted under race-blind admissions rules – would not suffer from mismatch, though few of the specifications used model this heterogeneity.

Our paper advances this line of research in several ways. First, we use a difference-in-differences identification strategy that, while relying on a traditional "parallel trends" assumption, allows us to identify effects away from the admissions discontinuity, and in particular allows for separate analysis of effects on Pulled In and Pushed Out students. Second, we use data on the population of Texas students rather than a single school district, giving a larger view of the effects of the policy. Third, we follow students beyond college, considering labor market outcomes using administrative earnings data linked to high school and college data.[3]

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[3] In later years, a large fraction of admittees to UT Austin were admitted via automatic admission. In the years covered by Daughtery et al (2014), 69% of the average entering class was admitted via automatic admission, whereas in our time period less than half of the incoming class was admitted this way. (University of Texas at

Consistent with past research, we find evidence that TTP dramatically changed student enrollment patterns (Long, Saenz, and Tienda 2010, Niu and Tienda 2010a). A large group of Pulled In students became more likely to attend both the flagship UT campus at Austin and the other, less selective four-year campuses as a result of the policy. This was not merely a shift from community colleges; instead, on net TTP pulled students into the Texas public higher education system (from not attending college, from private colleges, or from out of state institutions). More distally, we find that TTP increased the share of Pulled In students who graduated with bachelor's degrees within 6 years but reduced their likelihood of earning a STEM degree. We also find that it substantially increased log wages 7-9 years after high school. These are reduced-form effects, so they combine effects of increased selectivity with returns to college accruing to those induced to attend college at all by TTP. Our research design does not allow us to isolate the two components. We can establish, however, that that the net effect of TTP on Pulled In students is positive in terms of enrollment, graduation, and earnings and that the Pulled In students who attend UT-Austin as a result of TTP have graduation rates comparable to the average UT-Austin student, suggesting that these students were not mismatched.

For Pushed Out students the pattern is somewhat different. As expected, TTP reduced Pushed Out students' enrollment at UT-Austin. About two-thirds of the displaced students enrolled in less selective public four-year colleges in Texas, while another one-third enrolled in Texas community colleges. The net effect on overall (Texas, public) college enrollment is near zero. Thus, for the Pushed Out group, the policy experiment amounts to a reduction in college selectivity with no change at the extensive margin of enrollment. We find no reduction in Pushed Out students' college graduation probabilities, nor any sign that wages are reduced. This suggests that the benefits of attending a more selective public institution may be quite small for these students.

Taken together our results suggest that access to UT Austin improved outcomes for students who would not have attended absent the TTP and did not substantively damage graduation or earnings for students who were displaced. Contrary to claims that expanding admissions to students disadvantaged by test-based admissions will induce mismatch, the TTP experience indicates that, if anything, this would improve student outcomes on average.

Austin Office of Admissions 2010), This increased competition for admission for students outside of the top 10 percent and may explain why attendance out of state increased in later periods.

Our results pose a puzzle that we cannot fully resolve: Why does gaining access to selective institutions help students whereas students losing access does not affect measured student outcomes? We speculate, but cannot prove, that this pattern reflects differences that correlate with students' Pulled In/Pushed Out status: Pushed Out students are likely to come from families with more support for college success, so may be less dependent on inputs received from the college itself. This would be consistent with evidence from a variety of settings (e.g., the Project STAR class size experiment) that disadvantaged students are more sensitive to school inputs.

The paper unfolds as follows. Section 2 provides institutional details on the Texas higher education system and the Top Ten Percent plan. Section 3 describes the data and Section 4 details our empirical strategy. Section 5 presents our results and Section 6 presents a variety of tests to verify the robustness of our results. Section 7 then provides a discussion and concludes.