Coordinated Admissions Program

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The University of Texas at Austin is at the epicenter of the complex and contentious issue of determining who is admitted to oversubscribed public universities in the United States. Indeed, the University of Texas at Austin's experience with undergraduate admissions is representative of the difficulty that the nation faces in producing policies that determine who gains admission to the most desirable post-secondary opportunities. What is peculiar, both at The University of Texas at Austin and nationally, is that the legal arguments—for example, *Fisher v. Texas*— and the policy responses—for example, Texas's Top Ten Percent Rule—that address access and admission focus almost entirely on first-time freshman admissions, the traditional path to oversubscribed institutions, with little consideration of alternative paths that offer access to elite public universities. [1] This paper addresses this gap in our knowledge by examining the ramifications of providing a clearly articulated alternative path to The University of Texas at Austin.

Established in 2000 by the University of Texas's Board of Regents as a response to enrollment pressures that followed the passage of the Top Ten Percent Rule, the Coordinated Admissions Program (CAP) offers a path to The University of Texas at Austin for Texas residents who were not offered fall freshman admission or summer freshman admission. Texas residents not admitted to the University of Texas at Austin are offered the opportunity to enter into a contract with the University of Texas System that states that if students

[1] Arcidiacano and Lovenheim (2015) provides an excellent summary of economic research on the effects of various admissions policies.

attend a participating University of Texas System campus, complete 30 hours of prescribed coursework, and maintain a minimum 3.2 grade point average, then a student has the option of transferring to The University of Texas at Austin the following fall. [2]

The structure of CAP allows me to use the fuzzy regression discontinuity design to estimate the causal impact of taking an alternative path to The University of Texas at Austin on choice of major and the likelihood of graduation.

Data

This study uses administrative data from the Texas Education Agency and the Texas Higher Education Coordinating board that is housed at The University of Texas at Dallas's Education Research Center. To conform with the requirements of CAP, the sample consists of Texas residents who graduated from high school between the years 2003 to 2007 that were denied admission to the University of Texas at Austin, enrolled at one of the participating institutions, completed a total of at least 30 semester credit hours at the participating institution in the fall and spring semesters at the participating university, and have a cumulative grade point average within one half of a grade point of the threshold. This results in a sample of 2,235 students. Columns 1 and 2 of Table 1 contain the means of the control variables used in the study. Demographically, 48 percent of the sample is female and 50 percent is white. More than one quarter of the sample are underrepresented minorities. A tenth of the sample was classified as being at risk of dropping out of high school and 9 percent qualify for free or reduced price lunch. The average ACT for the sample is a 24 while 20 percent of the sample was classified as gifted and talented at the secondary level.

[2]Participating universities include UT-Arlington, UT-San Antonio, UT-Tyler, UT-Brownsville, and UT-Pan American. The minimum GPA was 3.0 for earlier cohorts.

Methodology

Consider a simple ordinary least squares model that of the relationship between transferral and a given academic outcome:

$$Y_i = \beta' X_i + \delta T_i + \epsilon_{1i} \tag{1}$$

Y_i is an academic outcome of interest for student i. X_i is a vector of data garnered from both a student's secondary schooling records and application data. β is the vector of regression coefficients associated with those characteristics. T_i is an indicator variable that assumes a value of one if a student elects to transfer to the University of Texas at Austin from a participating University of Texas System school to The University of Texas at Austin and ϵ_{1i} is an idiosyncratic error term. The goal is to estimate the causal effect of transferring to the University of Texas at Austin. T_i is likely endogenous. For example, transfers to The University of Texas at Austin are perhaps unobservably more ambitious than students who do not transfer. If ambition impacts the likelihood of transfer and is related to academic performance, then our estimate of δ does not solely represent the impact of the transfer on a given academic outcome. The structure of CAP provides an opportunity to produce a consistent estimate of the impact of transferring to The University of Texas at Austin for the set of students who transfer as a function of barely qualifying for the option to transfer provided by CAP.

The Coordinated Admissions Program requires that students meet or exceed the minimum GPA requirement to obtain the option of transferring to The University of Texas at Austin. This structure is amenable to the fuzzy regression discontinuity design. We use a two stage least squares framework to perform the analysis. Below, I present the system of equations.

$$T_i = \lambda' X_i + \alpha D_i + \Gamma_{1j} R_i + \Gamma_{2j} R_i^2 + \Gamma_{3j} D_i \times R_i^j + \Gamma_{4j} D_i \times R_i^2 + \epsilon_{2i} \tag{2}$$

$$Y_i = \rho' X_i + \gamma \widehat{T}_i + \Pi_{1j} R_i + \Pi_{2j} R_i^2 + \Pi_{3j} D_i \times R_i + \Pi_{4j} D_i \times R_i^2 + \epsilon_{3i} \tag{3}$$

Y_i, T_i, and X_i retain the same definition from equation 1. Let D_i be an indicator variable that assumes a value of one if a student meets or exceeds the minimum GPA requirement and zero otherwise. R_i, the running variable, is the difference between a student's own cumulative GPA and the appropriate minimum GPA measured in tenths of a grade point. D_i assumes a value of one if R_i exceeds zero. Standard errors in both equations 2 and 3 are clustered by R_i.

Equation 2 represents the first stage. T_i, the endogenous variable from equation 1 is regressed on D_i, X_i, and a quadratic in R_i that is fully interacted with D_i to produce the fitted values, $\widehat{T}_i$. In this framework, D_i is an instrument for T_i. I am able to estimate a particular local average treatment effect if D_i satisfies four requirements. First, D_i must be strongly strongly related to T_i. Second, D_i must be independent. Third, D_i must be excludable. Finally, D_i must have a monotonic effect on the likelihood of transferring to the University of Texas at Austin.

It is straightforward to determine the strength of the relationship between D_i and T_i directly by simply examining both the magnitude and statistical significance of the estimate of α from equation 2. The key assumption that supports the independence of D_i is that students have imprecise control over their cumulative grade point average. Imprecise control of grade point average produces local randomization about the threshold. (Lee, 2008) A direct result of local randomization is that students just below the threshold and students just above the threshold are exchangeable. That is, if local randomization occurs, then students just above the threshold and students just below the threshold have distributions of both observed and unobserved characteristics that are statistically indistinguishable.

The regression discontinuity design allows me to provide evidence of local randomization—which supports the independence of D_i—by showing that the distribution of pre-treatment characteristics does not change discretely at the threshold. I estimate the following specifications where x_i is an element in X_i:

$$x_i = \eta_x D_i + \Psi_{1j} R_i + \Psi_{2j} R_i^2 + \Psi_{3j} D_i \times R_i + \Psi_{4j} D_i \times R_i^2 + \epsilon_{4i} \tag{4}$$

I examine if η_x is statistically different from zero for each pre-treatment characteristic. I also estimate a set of equations that describe the behavior of pre-treatment characteristics at the threshold as a system of Seemingly Unrelated Regressions which combines the multiple tests into a single statistic that allows me to test if the data are consistent with the existence of no discontinuities for any of the observed covariates. (Lee and Lemieux, 2010)

The final two requirements are monotonicity and excludability. For this particular application, monotonicity means that exceeding the minimum grade point average and qualifying for the transfer option provided by the Coordinated Admissions Program cannot simultaneously cause some students to transfer to The University of Texas at Austin and other students to reject opportunity to transfer to The University of Texas at Austin. In this context, this is a reasonable assumption. Excludability means that we must assume that D_i impacts Y_i solely through its impact on T_i. If the above assumptions hold, then γ, the coefficient associated with $\widehat{T_i}$ in the second stage regression represents a particular local average treatment effect. (Imbens and Angrist, 1994) γ represents the effect of transferring to The University of Texas at Austin in the fall semester following the completion of the freshman year at a participating University of Texas System school for the subset of students who transfer as a result of barely qualifying for the option to do so.

Results

I first examine the behavior of the pre-treatment covariates in Table 1. Column 3 and column 4 contain the results from the regressions described in equation four that test for discontinuities in the control variables at the threshold. Of the nine estimates, only the coefficient associated with the female indicator variable was statistically significant. The results from the system of Seemingly Unrelated Regressions indicate that there is insufficient evidence to reject the null hypothesis that all the η_X are simultaneously equal to zero.

Column 3 of Table 2 contains the estimate of α from equation 2. All of the two-stage least squares estimates have the same first stage. There is clear of a strong relationship between D_i and T_i. The estimate indicates that exceeding the minimum required grade point average is associated with a 26 percentage point increase in the likelihood of a freshman at a participating University of Texas System institution transferring to the University of Texas at Austin the following fall. This estimate is highly significant with a t-stat in excess of 5. Taken together, the strength of the relationship between the instrument and the endogenous variable and the evidence that supports local randomization, suggest that D_i is a valid instrumental variable.

Table 2 contains both OLS estimates as presented in equation 1 and estimates from implementing the fuzzy regression discontinuity design via two stage least squares. The first outcome I examine is the likelihood that given student's final major is business. The OLS estimate indicates that transferring to The University of Texas at Austin from a University of Texas School is associated with a 14 percentage point decrease in the likelihood of a student selecting business as their final major. The IV estimate indicates that marginal transfers to The University of Texas at Austin are 34 percentage points less likely to select business as a final major relative to students who just fail to qualify for admission to the University of Texas at Austin via CAP and remain at one of the participating universities. OLS estimates indicate that transferring to Austin is associated with a 20 percentage point decrease in the likelihood of selecting the Social Sciences as the final major. The two stage least square estimate indicates that marginal transfers to The University of Texas at Austin are 33 percentage points less likely to select one of the Social Sciences as a major.

The next two classes of majors—Science, Technology, Engineering, and Math (STEM) and the humanities—show an interesting pattern of sign reversals. For the STEM majors, the OLS estimates indicate a 6 percentage point decrease in the likelihood of selecting a

STEM major as the final majors. The two stage least squares estimates shows that the marginal transfers to The university of Texas at Austin experience a 16 percentage point increase in the likelihood of selecting a STEM; however the estimate is imprecise.

Using OLS, I find that transferring to The University of Texas at Austin increases the likelihood of graduating within four years by 15 percentage points and the likelihood of graduating from college within six years increases by 13 percentage points. Both estimates are statistically significant. The two stage least squares point estimate indicates that transferring reduces the likelihood of graduating within four years by 16 percentage points; however, this estimate is very imprecise. Using two stage least squares, I estimate a small, imprecisely estimated decrease in the likelihood of graduating within six years.

Conclusion

Access to oversubscribed public universities is an issue that has received a great deal of political, policy, and legal focus. This paper examined the effects of a policy that is explicitly designed to provide a transparent and well articulated path to The University of Texas at Austin. Andrews, Li, and Lovenheim (2012) and Hoekstra (2009) find evidence the evidence of large labor market returns associated with large, oversubscribed universities. The demand for access to these schools is likely not to abate in the near future as students vigorously pursue the best collegiate opportunities. Therefore, it is imperative that we fully understand the ramifications of all policies that determine access to oversubscribed public universities.

The results of this study show that taking the path offered by the Coordinated Admissions Program has an impact on choice of major, particularly for marginal transfers. The evidence is inconclusive with regards to the impact of transfer on the likelihood of graduation for marginal transfer students. This paper shows that the presence of an alternative path to oversubscribed universities and the policies that determine which students are eligible to take the alternative path have a non-negligible impact on the choices that these students make while in college.

References

Andrews, R. J., J. Li, and M. F. Lovenheim (2012, May). Quantile treatment effects of college quality on earnings: Evidence from administrative data in texas. Working Paper 18068, National Bureau of Economic Research.

Arcidiacano, P. and M. Lovenheim (2015). Affirmative Action and the Quality-Fit Tradeoff. Forthcoming in the *Journal of Economic Literature*.

Hoekstra, M. (2009). The effect of attending the flagship state university on earnings: A discontinuity-based approach. *Review of Economics and Statistics 91*(4), 717–724.

Imbens, G. W. and J. D. Angrist (1994). Identification and estimation of local average treatment effects. *Econometrica 62*(2), pp. 467–475.

Lee, D. (2008). Randomized Experiments from Non-random Selection in U.S. House Elections. *Journal of Econometrics 142*(2), 675–697.

Lee, D. and T. Lemieux (2010). Regression Discontinuity Designs in Economics. *Journal of Economic Literature 48*(2), 281–355.

Table 1: Summary of Covariates

Variable	**Mean**	**(S.D.)**	$\widehat{\eta_{\mathbf{x}}}$	**(S.E.)**
	(1)	(2)	(3)	(4)
Female	.48	(.50)	-.12**	(.06)
Black	.05	(.21)	-.03	(.02)
Hispanic	.23	(.42)	-.01	(.05)
Asian	.21	(.41)	.06	(.05)
White	.50	(.50)	.02	(.06)
Economically Disadvantaged	.09	(.28)	-.03	(.03)
At Risk	.10	(.31)	.03	(.03)
Gifted	.20	(.40)	-.01	(.05)
ACT Score	24.00	(3.25)	.31	(.37)
N	2235		2235	
P-Value for χ^2 test of the H_0 that all η_x simultaneously equal 0 is .01				

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$The above table contains the summary statistics for the sample meeting the sample selection criteria that was discussed in the text. Column 3 contains the estimates of η_X from equation 4. The standard error associated with each estimate of η_X is contained in column 4.

Table 2: OLS and Fuzzy RD Estimates of the Effects of Transfer on Academic Outcomes

Dependent Variable	**Mean** (1)	**OLS** (2)	**First Stage** (3)	**2SLS** (4)
Business	.11	-.14***	.27***	-.34***
	(.32)	(.02)	(.05)	(.02)
Social Sciences	.24	.20***		.33**
	(.43)	(.01)		(.14)
STEM	.22	-.06**		.16
	(.42)	(.02)		(.12)
Humanities	.13	.02		-.08
	(.33)	(.02)		(.10)
4 Year Grad Rate	.64	.15**		-.16
	(.48)	(.05)		(.20)
6 Year Grad Rate	.79	.13***		-.01
	(.41)	(.03)		(.18)
N	2235	2235		2235

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Column number 1 contains the mean of the dependent variables with the standard deviations below in parentheses. Column 2 and Column 4 contain ordinary least squares and 2SLS estimates from the fuzzy regression discontinuity analysis of the CAP program, respectively. Standard errors are below each estimate in parentheses. Column 3 contains the estimate of α from equation 2 with the standard errors below in parentheses.