Marginal Returns to Public Universities


The typical marginally admitted university student completes an additional year of four-year education, is 12 percentage points more likely to earn a bachelor’s degree, and eventually earns 5-10 percent more than their marginally rejected but otherwise identical counterpart. Cost-benefit calculations show positive internal rates of return for students, society, and the government (which supplies financial aid).

Not too long ago, asking whether a college education was worth the time and expense was almost blasphemous. Of course, college was worth it. There was no better way to ensure achievement of the so-called American Dream of a nice home, a good career, and a prosperous family. However, in recent years, increased attention paid to student loan debt, along with labor market challenges in the Financial Crisis of 2007-8 and the COVID pandemic, have led many to ask whether a college education is worth the time and expense. Indeed, most American survey respondents now deem a four-year college education not worth the cost.

This conclusion stands in contrast to many studies that compare the earnings of individuals with different levels of college attainment vs. those who do not attend college. These studies typically suggest large earnings returns to college, on average. These returns are large enough, these studies suggest, to more than compensate for loan debt. However, these averages may not be relevant for all students. Further, they likely reflect selection bias: those who attain more education likely had more advantages from the outset, meaning that the supposed causal impacts of college may merely reflect systematic selection into college education.

What, then, of the marginal student without those advantages, who struggles to stay in school and who may drop out with loan debt and dim employment prospects? Regarding cost, even if college does boost earnings on average, someone still must pay for the privilege, whether students, taxpayers, or donors, and the policy-relevant net returns to enrolling marginal students may diverge substantially from the average. Put directly: Is the marginal American college student a good investment?

To address these and related questions, Mountjoy analyzes admission cutoffs used by over 30 public universities in Texas, utilizing administrative admission records spanning multiple cohorts. Together, these universities enroll over 10 percent of all US public university students. By identifying

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*Selection bias:* selection bias in a research study occurs when non-random data is selected for statistical analysis, which can lead to inaccurate conclusions when comparing the study sample to the population of interest or comparing different subsamples of individuals to each other.
hundreds of cutoffs in SAT and ACT scores that lead to abrupt changes in admission and enrollment, Mountjoy examines the outcomes of marginal applicants who barely made it past these cutoffs. In particular, he links these marginal applicants backward in time to their individual high school academic records and demographics to study their pre-college backgrounds, and forward in time to study their outcome trajectories of postsecondary enrollment, credit accumulation, degree completion, major choice, tuition costs, financial aid, student loan accumulation, and labor market earnings. This thorough approach allows for a transparent assessment of how outcomes change for students just above these cutoffs relative to those just below.

Before describing Mountjoy’s findings, a word about why it is important to study these marginal students. First, they straddle clear policy levers for public universities and state lawmakers in deciding whether to expand or contract admissions. Second, these students often have weaker academic preparation and, thus, uncertain returns to college enrollment. And last, these students straddle hundreds of cutoffs spanning nearly the entire public university sector of the second largest state over more than a decade, improving upon previous studies by offering a broader and more diverse sample, and therefore enabling a more comprehensive understanding of the returns to college attendance.

Briefly, Mountjoy finds the following:

- On average, among applicants to a given university in a given year, scoring just above rather than just below an admission cutoff causes the probability of admission to jump abruptly by 27 percentage points. Students who are induced to enroll by barely crossing an admission cutoff (“cutoff compliers”) complete an additional year of four-year education and are 12 percentage points more likely to earn a bachelor’s degree.
- About half of cutoff compliers fall back to another Texas four-year institution if rejected.

Note: This figure visualizes the effect of cutoff crossing on the sector of the initial college attended. These sectors correspond to the applicant’s first enrollment in the academic year after application. Each plot reports the local average treatment effect (LATE) estimate among cutoff compliers that results from dividing the reduced form discontinuity by the first stage enrollment discontinuity. The LATE of enrolling in the target university is 1 by construction, since that is the treatment variable. “No Texas Higher Education Coordinating Board College” means not enrolling in any institution in the Texas Higher Education Coordinating Board data, which span all public and non-profit private colleges in Texas. The horizontal axis measures an applicant’s ACT score or ACT-converted SAT score relative to the admission cutoff she faces. Please see working paper for more details.
Interestingly, only 6 percent of all cutoff compliers forego higher education altogether if rejected, and many turn to a two-year community college as their next-best alternative. This is a point worth stressing: the empirically relevant extensive margin among marginal university applicants is between the four-year sector and the two-year sector, rather than no college at all.

- Overall, cutoff compliers end up with meaningfully more postsecondary education in terms of both quantity and quality. Marginally admitted students pay no additional net tuition for this increased education; rather, they incur an additional $4,000 in gross tuition charges but receive a roughly equal amount of additional grant aid to nullify any incremental net cost. From society’s perspective, the average cutoff complier generates over $10,000 of additional costs of educating students in the four-year sector but reduces costs in the two-year sector by around $3,000.

- When it comes to earnings, admitted compliers earn less than their rejected counterparts in the first four years after application; in years five through seven, admitted compliers catch up to their rejected counterparts and, starting eight years out from application, they begin experiencing a persistent earnings premium. To put a number on it: Marginally admitted students eventually earn 5-10 percent more than their marginally rejected but otherwise identical counterparts.

- Gathering these and other results into a cost-benefit analysis of the private and social returns to enrolling marginal public university students, Mountjoy finds that the benefits of enrolling marginal students eventually surpass the costs, but at different horizons for students, society, and taxpayers. For students, benefits do not exceed costs until 8 years out from application; for society, the wait is between 12 and 13 years; and for taxpayers it exceeds 25 years.

- Finally, on the question of separate effects for students on the extensive margin of attending any four-year college vs. those who would fall back to a less-preferred four-year school if rejected, Mountjoy reveals a dominant role for the extensive margin in driving average marginal returns. That is, the admitted students who would have fallen out of the four-year sector if rejected reap the largest returns, with much smaller returns for admitted students who simply upgrade their four-year institution.

With increased attention on such issues as student debt relief, and with broader questions about the economic effects of college attendance, policymakers need a clearer picture of the costs and benefits of college education for marginal students, for taxpayers, and for society. This new work offers important insights into these issues.