The Effect of Financial Aid on Low-Income, College Ready Students

A summary of research by Josh Angrist, David Autor, Amanda Pallais

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Summary

Financial aid is a nearly universal feature of the American college experience. The National Center for Education Statistics reports that 85% of all first-time, full-time undergraduates at four-year schools received some sort of aid in 2018, amounting to over $180 billion spent by American governments and private funders. Government grant aid, that is, aid that does not need to be paid back, averaged about $3,700 per full-time undergraduate. Private and institutional grants came to almost $6,000 per student.¹

Financial aid is typically motivated by a desire to increase post-secondary attainment by making college more affordable. This raises the question of whether aid meets this test by boosting educational attainment. As with any sort of award or subsidy, it’s worth considering the extent to which financial aid changes behavior. The fact that aid is motivated by the desire to increase schooling does not mean aid programs accomplish this. Rather, aid may flow to students who would earn degrees even without financial assistance. Is financial aid really a good investment for charitable organizations? How might aid providers distribute aid more effectively?

For decades, the Susan Thompson Buffett Foundation (STBF) has offered grants to first time freshmen who wish to attend the state’s public colleges and universities. The Foundation is one of the largest private funders of college

students in the country, providing scholarship support to nearly 4,000 students annually. Nebraska residents who have not yet attended college are eligible to apply for an STBF award if their expected family contribution (EFC) is less than $10,000 and if their high school grade point average is above 2.5 on a 4.0 scale.²

In an effort to gauge the effectiveness of scholarship aid, the Massachusetts Institute of Technology’s School Effectiveness and Inequality Initiative (SEII) and STBF designed and implemented a randomized evaluation of the STBF scholarship program. The gold standard of evidence in social program evaluation is a randomized trial that selects equivalent treatment and control groups. The study awarded over 4,000 scholarships via random assignment between 2012 and 2016. This project is one of the largest randomized studies of a financial aid program ever undertaken.

The findings presented here summarize the scientific article, Angrist, Autor, and Pallais (2020), and are designed to help policymakers and funders understand how and why financial aid induces students to finish college degrees. In addition to quantifying the overall gains from aid, the research summarized here answers the question of who benefits most from aid, while also pinpointing the key mechanism that makes aid most effective.

The research finds that STBF awards boost bachelor’s degree completion by more than eight percentage points among applicants who target four-year schools on the STBF application. Specifically, aid increases the proportion of students who earn a BA in six years from 63% to 71%. Award effects on BA completion are especially high among students who are traditionally under-represented in higher education. On the other hand, so far the study has found that aid does little to increase degree completion among students who target community colleges. This mixed picture notwithstanding, financial aid directed towards motivated four-year college students passes a preliminary cost-benefit test.

Background and Policy Context

Scholars have long tried to answer the question of whether post-secondary aid boosts educational attainment. The challenge in answering this question with definitive evidence is that aid is not usually randomly assigned. Students who receive the most aid are often unique, either in their greater need for aid due to low family income or in their superior academic performance. This presents another challenge: students

² See https://buffettscholarships.org/ for more information on scholarship criteria and selection.
from lower income families are less likely to earn degrees for reasons beyond their eligibility for aid, while more prepared students who qualify for merit aid are more likely to finish a degree regardless of aid.

Economists and other social scientists refer to these problems by saying that aid is “confounded” with student characteristics. This is a technical way of saying that, in the absence of independent variation in aid awards, researchers can almost never be sure that a given research design has indeed separated the effect of aid alone from effects of family background or student preparedness.\(^3\)

**Research Design**

STBF has funded Nebraskan college students since 1966 and today supports nearly 4,000 students per year. In an effort to assess the efficacy of their aid program, STBF staff and SEII researchers worked together to fight this “confounding” issue by introducing the independent variation that researchers have been missing.

From 2012 to 2016, applicants to the STBF program were assessed by Foundation staff based on academic achievement, financial need, a personal essay, and letters of recommendation. The highest scoring applicants were awarded aid. The lowest scoring applicants did not receive an award. STBF staff and SEII researchers then worked together to randomize awards to a “middle group” of scholarship applicants, all of whom STBF judged to be similarly qualified and deserving of the award. Because STBF didn’t have the means to fund all applicants who applied for an award, randomization was a fair way to allocate scholarships.

Randomization ensures that applicants in the experimental sample who were awarded a scholarship and those who were not have comparable demographic characteristics, high school academic achievement (as measured by GPA and ACT), and family background. The comparability of these two groups allows the researchers to identify causal effects of financial aid with a precision that previous answers to the efficacy of aid question have not provided. Any statistically significant difference in post-secondary outcomes between the treatment and control groups — meaning a difference that is unlikely to occur by chance — can be attributed to the STBF award.

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\(^3\) Dynarski and Scott-Clayton (2008) and Deming and Dynarski (2009) summarize the challenges faced by social scientists interested in the causal effects of financial aid.
Findings and Policy Lessons

The research finds significant effects of an STBF award on college completion and persistence. The size of these effects varies with applicants’ background and demographics: generally, the applicants who benefit the most are from groups that have been historically underrepresented in post-secondary education. These groups include Nonwhite and first-generation applicants, as well as applicants with low ACT scores and high school GPAs.

Lesson 1: STBF awards increase bachelor’s degree completion.

For applicants who target four-year schools, an STBF award boosts six-year bachelor’s degree completion by a statistically significant 8.4 percentage points, a substantial gain compared to a control group mean of 63 percent completion.

While a small portion of this effect (about 3 points) comes from fewer students completing an associate degree, most of the gain in bachelor’s
degree completion comes from a nearly 6-point reduction in students earning no degree. In other words, over two-thirds of the increase in bachelor’s degrees are “new” degrees that would not have existed in the absence of STBF aid.

Lesson 2: Students from groups traditionally under-represented in higher education gain the most from scholarship aid.

Specific subgroups of applicants defined by demographic and academic characteristics benefit even more from an STBF award than the average four-year student. Applicants who have been traditionally under-represented in higher education, including Nonwhite applicants, applicants who are eligible for a Pell grant, and applicants who have below-median ACT scores or high school GPAs experience particularly large gains in degree completion when awarded aid. Gains in bachelor’s degree completion among applicants in these groups are at least double that of their peers in complementary subgroups (white, not Pell-eligible, those with above-median GPAs or ACT scores).

Not all aid seems to affect degree completion, however. Awards to applicants targeting two-year schools have no significant effect on associate or bachelor’s degree completion.

Figure 2: Bachelor’s Degree Completion by ACT Score

A. Below median ACT (35% of sample)

B. Above median ACT (65% of sample)

Notes: This figure plots mean degree completion rates by treatment status for four-year targeters. Grey lines plot bachelor’s degree completion rates for applicants who don’t receive an award; pink lines plot the sum of that mean and the effect of an award on completion. Whiskers mark 95 percent confidence intervals. Samples differ by year. The median ACT score for Nebraska test-takers is 21.
Applicants’ college aspirations, as stated on their scholarship application, also provide a useful indicator of aid impact. Students who target University of Nebraska at Omaha (UNO), for example, exhibit significantly larger degree attainment effects than their peers who target the campuses in Lincoln or Kearney. UNO is an urban campus and applicants who target the school are disproportionately Nonwhite, lower-income, and have lower academic achievement in their high school years. In short, the population of students targeting UNO is highly concentrated with student subgroups for whom the award has a large effect on degree attainment.

Lesson 3: Aid is effective when it promotes full-time enrollment in a four-year college in a student’s first year.

How does aid increase BAs so sharply? Scholars have considered a number of channels through which aid might help students see their college plans through. One possibility is that aid allows students to embark on a more costly—but also more ambitious—college program. This study argues that, based on two key findings, this is the most important channel.

The first key point is the increase in enrollment at four-year schools among students who receive an STBF award. The research shows that award effects on degree completion are largest for applicants who are least likely to enroll in a four-year program absent an STBF award. These applicants otherwise enroll in two-year programs or not at all.

The effect of an award on degree completion is further explained by the award’s effect on credits earned towards a bachelor’s degree in the first year of study. Among applicants who were unlikely to enroll in a four-year program without STBF aid, those who were most successful in completing their bachelor’s degree took a full-time credit load at a four-year college in their first year after high school graduation. The evidence indicates that aid is largely unrelated to outcomes outside of this early enrollment channel.

Applicants were most successful in completing their bachelor’s degree when they took a full-time credit load at a four-year college in their first year.

Lesson 4: The STBF program passes a preliminary cost-benefit test

The cost of a financial aid program can be considered using two cost measures. The first is intuitive: cost to the funder. Funder cost is the amount of money STBF spends on each student in the applicant pool. Applicants who don’t receive an award cost STBF $0, whereas the average cost of an STBF awardee is
$34,000. The second cost measure is “incremental cost of attendance” (COA), defined as the difference between “sticker price” paid by treatment and control students regardless of who pays (e.g., if payment occurs via grants, loans, out of pocket, etc.). In practice, incremental COA is positive because an STBF award shifts treated applicants to more expensive schools and increases the time it takes for them to earn a degree. Sticker price is defined as tuition, fees, and a basic cost of books and supplies. Incremental COA can be thought of as costs that would not have been incurred absent an award. Incremental COA among scholarship awardees averages approximately $6,000, which is less than one-fifth of the $34,000 funder cost.

Earnings benefits of scholarship awards are estimated using data from the American Community Survey to project lifetime earnings among Nebraska-born men based on years of schooling and separately based on degree attainment. For every subgroup studied, the lifetime earnings impact of an award is larger than the incremental COA – in short, the benefits of the program outweigh the costs. In addition, the lifetime earnings impact of an award is greater than funder cost (which is far higher than incremental COA) in approximately half of student subgroups considered. The student subgroups that pass a cost-benefit assessment using funder cost are those whose graduation rate are most impacted by an STBF award.

The researchers acknowledge the preliminary nature of these benefit calculations and will provide a more definitive assessment of longer-run outcomes such as earnings, employment, and debt reduction as more time passes.

**Conclusion**

Hundreds of billions of dollars are spent by governments, institutions, and private sources on college financial aid each year. This experiment, one of the largest and most extensive of its kind, finds that aid leads to a sizable increase in four-year degrees. Importantly, this increase is concentrated among groups that are less likely to obtain a bachelor’s degree without financial aid, such as Pell-eligible applicants, Nonwhite applicants, and applicants with lower high school grades and test scores. Evidence suggests that aid awards increase degree attainment mainly by increasing early full-time enrollment in a four-year college.
The findings presented here have important initial policy implications, although further research is needed to make specific policy recommendations. First, interventions that improve initial enrollment in a full-time credit load at four-year colleges could lead to large gains in bachelor’s degree completion. Additionally, financial aid awarded after students’ first year of college may be less effective than aid awarded earlier. Thus, there may be a large long-run payoff to less-costly interventions that act to enhance early enrollment in a four-year program (examples include Bulman (2015) and Carrell and Sacerdote (2017)).

Finally, a cost benefit analysis indicates that aid programs are a sound investment for funders and that aid targeted at students traditionally under-represented in higher education can provide especially favorable returns.

References


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About Our Partners

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About SEII

The School Effectiveness and Inequality Initiative (SEII) is a research lab based in the MIT Department of Economics. SEII partners with school districts and higher education institutions to conduct policy-relevant research and examine the connections between human capital and the American income distribution.

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