Losing Aid, Losing Ground? The Academic and Career Consequences of Financial Aid Loss — Evidence from the TEXAS Grant

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March 17, 2025

Abstract

This paper examines the impact of losing financial aid on students' academic and labor market outcomes by leveraging a multidimensional difference-in-discontinuities design at the renewal thresholds of the TEXAS Grant. Unlike prior research that focuses on initial renewal checkpoints, this study analyzes the consequences of aid loss after the second and third years of college, when students have made significant academic progress but remain financially vulnerable. Results show that losing the TEXAS Grant significantly reduces total financial aid, leading to increased borrowing but little compensatory increase in earnings from work-study or employment. Aid loss decreases full-time enrollment, credit accumulation, and persistence, particularly for students who fail to meet the credit renewal threshold despite strong academic performance. Losing aid after the second year accelerated time to graduation for some students while reducing enrollment intensity for others, ultimately leaving overall degree attainment unchanged. In contrast, third-year aid loss primarily decreased timely graduation rates. While overall estimates do not indicate a broad reduction in graduation, students who lost aid after either renewal due to a failed course — but were otherwise academically strong — were significantly less likely to graduate. These findings highlight the critical role of continued financial aid in promoting college completion and suggest that financial aid policies should account for differences in students' academic standing when structuring renewal requirements.

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1 Introduction

Higher education in the United States is increasingly financed through a complex system of financial aid programs, including federal grants, state and institutional scholarships, and student loans. Further, the rising cost of higher education has led to increasing reliance on financial aid as a means of maintaining college access and affordability. Over the past three decades, inflation-adjusted tuition and fees at four-year public institutions have more than doubled, while median family income has only increased by 38% (Ma et al., 2024). In response, federal and state policymakers have expanded financial aid programs, keeping net cost of attendance relatively stable (U.S. Department of Education, National Center for Education Statistics, 2023).

While these efforts have mitigated some of the financial burden on students, they have also made financial aid an increasingly central component of the higher education system. In fact, for the 2022-2023 academic year, 85.2% first-time undergraduate students received some form of financial aid, averaging $12,997 in grant aid and $7,709 in loans (U.S. Department of Education, National Center for Education Statistics, 2023). For many students, financial aid is not merely a supplement but a necessity for accessing and completing higher education. However, as tuition continues to rise, the effectiveness of financial aid in keeping pace with costs remains an open question, particularly as some states and institutions face budget constraints that limit further investment in aid programs.[1]

At the same time, discussions of student debt relief and forgiveness programs — such as the Biden administration's stalled efforts to cancel a portion of federal student debt — highlight broader concerns about the financial sustainability of higher education. While these policies aim to improve affordability, they also introduce uncertainty for students, as funding structures remain politically contested and subject to frequent revisions.

Further, uncertainty in federal education policy further complicates financial aid stability. The U.S. Department of Education has faced significant challenges in implementing new financial aid initiatives, including delays in grant disbursement and sudden shifts in loan repayment policies. The Trump administration's recent temporary freeze on federal financial aid, which halted funding for various education and research programs pending policy reviews, further highlights the risks associated with unpredictable federal interventions (Office of Management and Budget, 2025). The freeze, coupled with changes in Title IV funding mechanisms, raised concerns about the reliability of financial aid as a long-term support system for students, particularly those who depend on consistent funding to remain enrolled.

Moreover, administrative hurdles in the financial aid system create additional challenges for students, particularly in maintaining eligibility. The recent delays in Free Application for Federal Student Aid (FAFSA) processing have raised alarms about disruptions in initial enrollment and continued persistence, particularly for students most reliant on financial assistance. The complexity

[1]For example, Indiana's primary need-based grant, the Frank O'Bannon Grant, will reduce award amounts for most students beginning in fall 2025 (Indiana Commission for Higher Education, 2025), and Missouri's merit-based Bright Flight Program saw its maximum award decline by 40% in fall 2022 due to budget limitations (Missouri Coordinating Board for Higher Education, 2020).

of the FAFSA process, combined with uncertainty about aid eligibility criteria, can discourage students from initially applying or reapplying for aid even when they remain eligible (Bettinger et al., 2012 & Kofoed, 2017). Research has shown that simplifying financial aid applications leads to increased college attendance and retention, underscoring how administrative burdens can function as de facto barriers to access (Castleman and Page, 2016). If students fail to renew their aid or miss critical deadlines, they may experience unintended financial shocks, forcing them to either increase work hours, reduce course loads, or drop out entirely.

Beyond application complexities, renewal requirements for financial aid — primarily maintaining a minimum GPA and/or a specified enrollment intensity — can lead to aid loss. Federal regulations mandate that students must uphold Satisfactory Academic Progress (SAP), typically defined as maintaining at least a 2.0 GPA and successfully completing 67% of attempted credits. Failure to meet these standards results in the forfeiture of financial aid, a situation affecting over one-quarter of initial community college Pell Grant recipients (Schudde and Scott-Clayton, 2016). State programs typically have more stringent renewal requirements, leading to students in good academic standing losing aid. For example, the Georgia HOPE Scholarship requires recipients to maintain a 3.0 cumulative GPA, contributing to 35% of initial recipients losing the award by the second renewal point in recent cohorts (Georgia Office of Research and Policy Analysis, 2024).

While extensive research demonstrates that reducing college costs through grants and scholarships increases enrollment, persistence, and completion rates (Castleman and Long, 2016 & Denning et al., 2019), much less is known about the consequences of losing financial aid after students have already made progress toward a degree. Given the central role of financial aid in financing higher education and the myriad ways students lose aid — whether through academic performance, enrollment intensity, administrative barriers, shifts in eligibility, or policy changes — it is critical to understand how aid loss affects student outcomes. In practice, a substantial share of students do lose aid each year, even when they remain enrolled and in relatively good academic standing. If financial aid is essential for college access and persistence, then disruptions in aid could lead to academic setbacks, changes in enrollment patterns, and increased reliance on loans or employment. Despite these high stakes, research on the impact of aid loss remains limited, leaving policymakers and institutions without clear evidence on how students navigate the financial and academic consequences of losing aid.

In this paper, I examine the consequences of losing financial aid due to unmet renewal requirements in the Toward EXcellence, Access, and Success (TEXAS) Grant program, focusing on its effects on academic performance, degree attainment, major choice, and early-career earnings. While prior research has focused on first-year benchmarks, this study shifts the focus to aid loss after the second and third years of college, shedding light on how students adjust when financial support is withdrawn later in their academic careers. By distinguishing between students who lose aid due to GPA versus credit completion shortfalls, this analysis uncovers heterogeneity in the effects of aid loss, showing that financial aid policies may impact students differently depending on which academic benchmarks they fail to meet.

Results show that the consequences of aid loss depend heavily on when and to whom it occurs. Losing aid after the second year leads to a mixed response — some students hasten their graduation, while others struggle to adjust, reduce their enrollment intensity, and ultimately drop out. In contrast, losing aid after the third year primarily delays graduation but does not significantly reduce overall degree attainment. At this later stage, students have fewer opportunities to adjust their academic plans, making persistence more likely but often at the cost of reduced enrollment intensity and extended time to degree. The most severe academic setbacks are concentrated among students near only the credit renewal threshold, whereas those near only the GPA threshold or both thresholds do not experience the same level of negative impacts. These findings suggest that financial aid renewal policies should account for differences in students' academic standing and responses to aid loss, rather than applying uniform consequences across all students who fail to meet renewal criteria.

This paper proceeds as follows. Section 2 details the TEXAS Grant program and its renewal criteria. Section 3 reviews the relevant literature and highlights this paper's key contributions. Section 4 describes the data, while Section 5 outlines the empirical strategy used to estimate the causal effects of aid loss. Section 6 presents the results, and Section 7 concludes by summarizing key findings and proposing policy reforms to improve the design of financial aid renewal requirements.

2 TEXAS Grant

The TEXAS Grant is a statewide program that began in the 1999-2000 academic year to provide financial aid to students attending public universities in Texas. To initially qualify for the TEXAS Grant, one must be a Texas resident with financial need as determined by the FAFSA enrolling at least three-quarter time in a four-year degree program in Texas within 16 months of graduating high school.[2,3] Unlike many other state programs, there is no high school GPA or SAT/ACT threshold to qualify for the TEXAS Grant. The average award from the program is approximately $6,000 per year and students can receive five years of aid through the program.

As a statewide, need-based grant, aid from the TEXAS Grant reaches a significant portion of students in Texas. Nearly 83,000 students — approximately 1 out of every 6 students in public Texas universities — received funding through the program in the 2020-2021 academic year, totaling over $400 million in aid. More than half (54%) of recipients are Hispanic and 56% have expected family contributions (EFCs) of $0. TEXAS Grant funding is distributed across a wide range of institutions, with awardees enrolled at over 120 schools, including those in the University of Texas system, Texas A&M, and all other four-year public universities in the state. On average, this grant accounts for nearly one-third of students' total financial aid packages, making it a critical source

[2]Students must also be registered for the Selective Service and never have been convicted of a felony or any offense involving a controlled substance.

[3]While 95% of recipients enter from high school, students can also qualify if they have earned an associate's degree and pursue a bachelor's within a year of completion, enroll after an honorable discharge from the military, or satisfy additional requirements after beginning their bachelor's degree with the Texas Educational Opportunity Grant. This paper only considers students entering after high school.

of support for many.

To continue receiving the TEXAS Grant, students must meet institutional SAP requirements after their first year. Then, beginning in the second year, they must maintain a 2.5 cumulative GPA and complete at least 24 credit hours each academic year. As shown in Figure 1, a significant number of students fail to meet these renewal criteria. Among the fall 2011 through fall 2018 entering cohorts, 152,837 students received the TEXAS Grant in their first year. While 136,238 (89.1%) persisted to a second year, 19,511 (14.3%) did not continue receiving the grant. Attrition at later renewal points was even higher — of the 109,251 students who returned for a third year, 31,821 (29.1%) did not renew. By the fourth year, 18,313 of the 75,683 (24.1%) remaining TEXAS Grant recipients failed to renew, further reducing the number of students receiving aid as they approached degree completion.

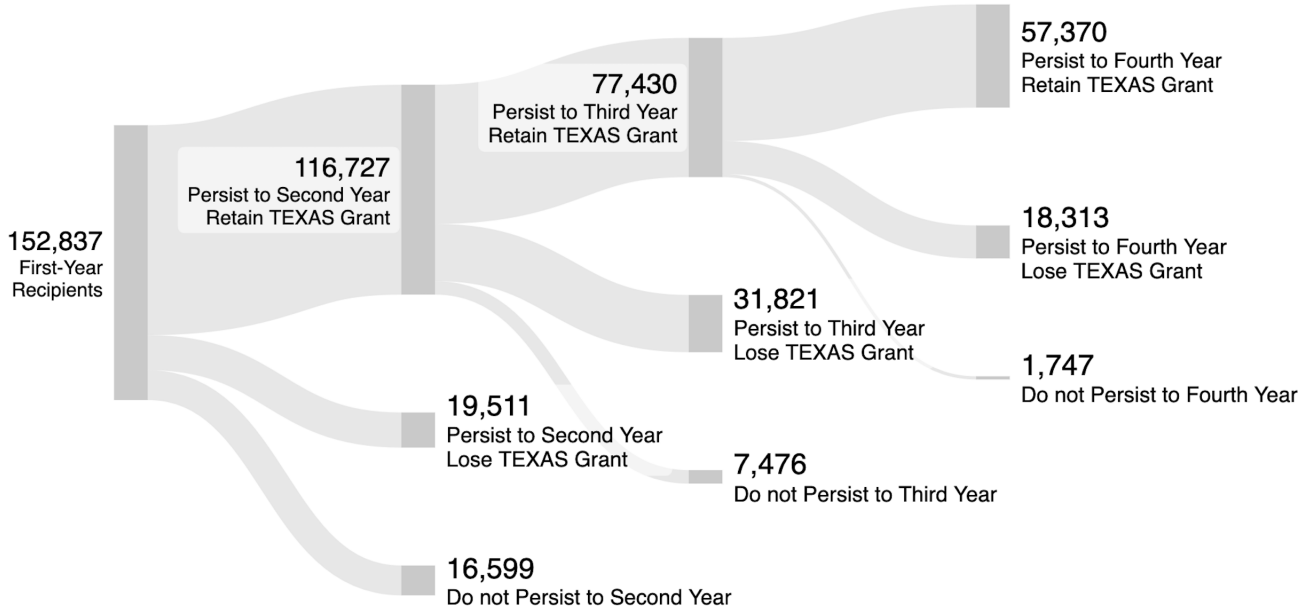


Figure 1. Flow of TEXAS Grant Recipients

These statistics highlight the prevalence of aid loss in the TEXAS Grant program. Among students who remain enrolled, nearly 70,000 in these eight cohorts failed to renew their grants, resulting in significant repercussions to their financial aid packages. For instance, a student who loses eligibility after their second year forfeits more than $6,000 per year in TEXAS Grant funding — totaling over $18,000 if they graduate in five years. Many of these students cannot afford to attend college without this aid, forcing them to either replace the lost funding — through other grants, increased borrowing, credit card debt, or additional work hours — or reduce their enrollment intensity. These financial constraints can disrupt students' academic trajectories, making it critical to understand how aid loss shapes their educational and labor market outcomes.

3 Literature Review and Contributions

3.1 Literature Review

This paper contributes to two key areas within the financial aid literature: the consequences of financial aid loss and the effects of student debt on career choices. When students lose grant aid, they often turn to alternative funding sources, with loans being the most immediate and accessible option. This change in aid composition can have important implications for student persistence, graduation, and career trajectories. To provide context for why aid loss may impact students, it is first important to understand how financial aid affects student outcomes. This section reviews the literature on these topics to establish a foundation for evaluating the effects of aid loss.

3.1.1 Financial Aid, Debt, and Student Outcomes

Research consistently finds that lowering the cost of college improves enrollment, persistence, and completion (Nguyen et al., 2019). Need-based grants, such as the federal Pell Grant, have a particularly strong impact on enrollment and degree attainment, especially for low-income students (Goldrick-Rab et al., 2016, Castleman and Long, 2016, Denning et al., 2019, & Denning, 2019). In contrast, merit-based aid primarily influences where students enroll rather than whether they attend college, often drawing students to in-state institutions (Mayer et al., 2015). However, merit aid generally does not increase overall enrollment or significantly affect student achievement (Monks, 2009, Sjoquist and Winters, 2015, & Angrist et al., 2022).

The long-term effects of financial aid extend beyond college, influencing career choices and labor market outcomes. While direct evidence linking grant aid to post-college earnings is limited, financial constraints significantly influence students' career decisions. Stater (2011) finds that higher net costs of attendance increase the likelihood of students selecting professional majors while decreasing their likelihood of majoring in the humanities and certain sciences. Reducing student loan burdens has been shown to increase the likelihood of graduates pursuing lower-paying public service and nonprofit careers, whereas higher debt levels push students toward higher-paying private-sector jobs (Rothstein and Rouse, 2011). Building on this, Hampole (2023) examines the staggered implementation of over 20 "no-loan" policies across more than 700,000 graduates, showing that students with higher debt levels choose majors with higher initial earnings, but lower lifetime earnings. This effect is particularly pronounced among low-income students, who are more sensitive to debt burdens in their decision-making.

Finally, several studies have established a clear link between student debt and mental health, raising concerns that reliance on loans imposes not only financial but also psychological costs. Research has associated high debt burdens with increased stress, anxiety, and depression (Selenko and Batinic, 2011, Sweet et al., 2013, & Hojman et al., 2016). More specifically, student debt has been shown to negatively impact mental well-being (Walsemann et al., 2015 & Despard et al., 2016), which may, in turn, influence academic performance, persistence, and career choices (Herzog,

2018, Destin and Svoboda, 2018, & Baker and Montalto, 2019). These findings highlight the broader consequences of debt-financed higher education, suggesting that financial aid policies should consider not only students' ability to pay but also their psychological and long-term economic well-being.

3.1.2 Financial Aid Loss and Student Outcomes

While the literature on the impacts of financial aid is extensive, relatively little research examines the consequences of losing financial aid. Some early work suggests that changes in financial aid status may be more consequential than the initial level of aid a student receives, as fluctuations in a student's aid package could significantly alter their educational trajectory (Bettinger, 2004). Empirical evidence supports this concern: Henry et al. (2004) examines the Georgia HOPE Scholarship — a program covering full tuition, books, and mandatory fees for in-state students with at least a 3.0 high school GPA, contingent on maintaining a 3.0 cumulative GPA and attempting at least 30 credits per year. His findings indicate that students who lost eligibility for the scholarship had similar credit accumulation, GPAs, persistence rates, and four-year graduation rates to those who barely missed qualifying for the program upon entering college. However, students who retained the scholarship throughout their academic careers had significantly better outcomes than both groups.

More causal evidence of the impact of financial aid loss emerged with Carruthers and Özek (2016)'s examination of Tennessee's HOPE Scholarship. The program covered approximately 70% of tuition and fees for up to five years for Tennessee high school graduates who met either the 3.0 high school GPA or a 21 ACT requirement. However, continued eligibility required maintaining a 2.75 cumulative GPA after 24 attempted credit hours and a 3.0 cumulative GPA at 48, 72, and 96 credit-hour checkpoints. Using a regression discontinuity design (RDD) at the first GPA renewal threshold, Carruthers and Özek (2016) finds that students who lost eligibility became slightly detached from college, as reflected in a 14 cent increase in earnings per dollar of aid lost. However, losing the scholarship did not appear to affect overall persistence or graduation rates.

More recent work by Cummings et al. (2022) reexamines the consequences of losing the Tennessee HOPE Scholarship at the same 2.75 GPA checkpoint for cohorts entering between fall 2011 and fall 2014. Losing the scholarship meant a reduction of roughly $2,000 in aid per semester, with the effects of aid loss varying by race and socioeconomic status. Students just below the GPA threshold were more likely to stop out if they were wealthier white students, while Black students had higher community college transfer rates and lower on-time degree completion compared to their peers who barely maintained eligibility. These findings suggest that aid loss disproportionately affects certain demographic groups, potentially exacerbating existing inequities in higher education.

Most relevant to this paper is Jones et al. (2021)'s research on changes to the Georgia HOPE program. Beginning in 2011, the HOPE Scholarship was reduced to cover only 90% of tuition, eliminating funding for books and mandatory fees. In its place, the newly created Zell Miller

Scholarship covered full tuition but imposed stricter eligibility requirements: a 3.7 high school GPA, a 1200 SAT (or 26 ACT) score, and a 3.3 cumulative college GPA to maintain eligibility. Continuing students were not grandfathered into the Zell Miller program, meaning those who did not meet its higher thresholds but remained eligible for HOPE experienced a modest 15% reduction in aid.

Studying these changes, Jones et al. (2021) employs a multidimensional RDD to estimate the effects of this partial aid reduction for cohorts entering college no more than two years before the change. Unlike traditional RDD approaches that rely on a single cutoff, this method accounts for multiple eligibility thresholds simultaneously, allowing for a more precise identification of students' varying exposure to aid reductions. Jones finds no significant impact on persistence or graduation rates, suggesting that higher-achieving students may be less sensitive to modest financial aid reductions or that the 15% aid cut was not substantial enough to disrupt educational trajectories. His findings contribute to the broader literature by demonstrating that the impact of financial aid loss depends not only on the magnitude of the financial shock but also on student characteristics such as academic preparation.

3.2 Contributions

This paper makes several contributions to the literature on financial aid loss and student outcomes. Most existing work focuses on merit-based programs, leaving a gap in understanding how need-based aid loss affects students. This study addresses that gap by examining a large-scale need-based grant program with structured renewal criteria, providing new insights into the academic, financial, and labor market consequences of aid loss. Below, I outline the key contributions of this paper.

First, this paper extends the literature by analyzing a need-based financial aid program with both GPA and credit completion renewal requirements, in contrast to merit-based programs that primarily focus on GPA thresholds. Unlike the Georgia and Tennessee HOPE Scholarships, which require students to maintain a relatively high GPA (at least 2.75), the TEXAS Grant has a lower GPA threshold (2.5) but also includes a credit completion requirement, making it accessible to a broader range of students. The size of the TEXAS Grant award also distinguishes it from other programs: at over $6,000 per year — approximately one-third of recipients' total financial aid — it represents a more substantial aid reduction for students who lose eligibility.

Another key distinction is how renewal eligibility is assessed. The Georgia (Tennessee) HOPE program evaluates GPA eligibility after students attempt 30, 60, and 90 (24, 48, and 72) credit hours — regardless of how many terms it takes to reach those thresholds. In contrast, the TEXAS Grant assesses eligibility at fixed points in time: the end of a student's first, second, third, and fourth year. Additionally, rather than basing renewal on attempted credits, the TEXAS Grant requires students to successfully complete at least 24 credits per year to maintain eligibility.

A further crucial difference is that TEXAS Grant recipients who lose eligibility cannot regain it, whereas Georgia and Tennessee HOPE recipients may restore their scholarship if they meet GPA

thresholds at a later checkpoint. As a result, TEXAS Grant students who temporarily struggle academically or fall behind in credit accumulation face a permanent loss of aid, while students in the other programs have an opportunity to re-qualify. This distinction has important policy implications, as the consequences of failing to meet renewal criteria are more severe under the TEXAS Grant program. By studying this alternative structure, this paper provides new evidence on how different renewal benchmarks, reinstatement policies, and the magnitude of aid loss influence student outcomes, contributing to ongoing discussions on the optimal design of financial aid programs.

Second, this paper is the first to examine the effects of financial aid loss at later renewal benchmarks — specifically, at the end of the second and third years of college. Existing studies focus on the first eligibility checkpoint, leaving open the question of whether the consequences of aid loss differ when students are further along in their academic careers. Understanding these effects is particularly important for policymakers aiming to ensure that financial aid programs not only expand access to higher education but also support students through degree completion.

Third, this paper broadens the scope of outcomes examined in the context of financial aid loss. While existing research studies impacts on persistence, graduation, and short-term financial responses, this paper extends analysis to major choice and early-career earnings. Examining major switching provides insight into whether students adjust their academic paths in response to financial constraints, while the earnings analysis offers the first evidence on how losing financial aid affects labor market outcomes in the years following college exit. These findings are particularly relevant to ongoing policy discussions on student debt and its influence on career trajectories.

Fourth, this study provides the most comprehensive analysis to date on how students compensate for lost financial aid. Unlike prior work that examines loan uptake or outside employment as isolated responses to aid loss, this paper considers a broader range of financial adjustments, including increases in other grants, loans, work-study earnings, and external employment. Additionally, I tracks adjustments over multiple years, capturing whether students secure alternative funding sources or if financial constraints persist throughout their academic careers. This broader perspective offers a more complete understanding of how students navigate financial hardship and whether their financial adjustments fully offset the loss of grant aid.

Lastly, this paper moves beyond estimating the effects of financial aid loss for students near either renewal threshold by further segmenting the analysis based on whether students are close to both thresholds or only one. While Jones et al. (2021) explores this as a robustness check, their approach relied on high school academic outcomes that were retroactively applied to adjust aid, making it less suited for capturing how current college performance influences the impact of aid loss. In contrast, this study leverages college performance metrics, providing a more direct and policy-relevant framework for understanding heterogeneity in the effects of aid loss. Specifically, it examines whether financial aid loss differentially affects students facing academic struggles (only around the GPA threshold), students with higher GPAs who failed a course (only around the credit threshold), or students close to both thresholds. By explicitly analyzing these differences, this study

provides deeper insights into how the interaction between GPA- and credit-based renewal criteria shapes student responses to aid loss, offering important implications for financial aid policy design and academic interventions.

Taken together, these contributions deepen our understanding of how financial aid loss affects students across multiple dimensions. By employing a multidimensional empirical strategy, broadening the range of outcomes analyzed, examining later renewal benchmarks, and focusing on a large-scale need-based program that serves a broader student population, this paper provides new insights for policymakers aiming to design more effective and equitable financial aid policies.

4 Data

The data for this paper come from the Houston Education Research Center, which houses longitudinal data provided by the Texas Education Agency (TEA), the Texas Higher Education Coordinating Board (THECB), and the Texas Workforce Commission (TWC). These records track students who attended both high school and a public university in Texas, linking their postsecondary enrollment, academic performance, and employment histories. The postsecondary data include annual financial aid records, student admissions information, semester-by-semester courses, grades, and majors, and graduation outcomes. Employment records contain quarterly wage reports from Texas employers, detailing both earnings and North American Industry Classification System (NAICS) employment sector. However, these records may not fully capture earnings from informal employment, gig work, or self-employment, which can be significant sources of income for students.

The financial aid data include an explicit indicator for TEXAS Grant receipt, as well as all other sources and amounts of financial aid a student receives. These data allow me to analyze how students compensate for losing the TEXAS Grant by breaking down aid adjustments across grants, loans, and work-study. Additionally, I use the TWC data to examine changes in earnings patterns in response to aid loss. All financial aid amounts are expressed in 2021 dollars using the Bureau of Labor Statistics' College Tuition and Fees Price Index (Series ID: CUUR0000SEEB01), while earnings data are adjusted to 2021 dollars using the Consumer Price Index for All Urban Consumers (Series ID: CUUR0000SA0).[4]

The semester-by-semester course and grade data provide the necessary information to calculate cumulative GPA and credit accumulation, determining whether a student meets TEXAS Grant renewal requirements. Additionally, course subjects allow for the classification of credit accumulation across different fields. Students' declared major(s) each semester are identified using 6-digit Classification of Instructional Programs (CIP) codes, while graduation records document graduation dates, majors, and degrees earned. Admissions data include student and family demographics, such as age, gender, race/ethnicity, parental education, and family income ranges. Because the data cover all Texas public universities, I can track students who transfer and graduate within

[4]The final academic year included in the financial aid data is 2021-22, making 2021 the most appropriate base year for inflation adjustments.

these schools; however, those who transfer out of state or to private institutions are no longer observed in the dataset.

To align with the availability of semester-by-semester course and grade data required to track GPA and credit accumulation, this analysis uses data spanning fall 2011 through spring 2022. The sample includes cohorts entering between fall 2011 and fall 2018, ensuring that all students are observed for at least four years. Since the TEXAS Grant is available only to in-state students, I further restrict the sample to students who attended high school in Texas. After applying these initial restrictions, the dataset includes 186,234 TEXAS Grant recipients. Additional sample restrictions, described in the methodology section, further refine the analysis.

5 Methodology

5.1 Framework

As the TEXAS Grant renewal threshold at the end of the first year is not universal across all universities — and given that prior research has already examined aid loss at initial renewal benchmarks — this paper focuses on renewal at the end of a student's second and third years. At these checkpoints, all students must maintain a minimum of a 2.5 cumulative GPA and complete 24 credits each academic year to remain eligible.

Restricting the analysis to either the GPA or credit threshold alone in a single-dimensional RDD would not only sacrifice variation but also limit the generalizability of the findings. Because both thresholds jointly determine eligibility, a single-threshold approach would estimate effects only for students near one particular cutoff, rather than capturing the broader impact of aid loss across different academic profiles. While understanding the heterogeneity of responses among students at each threshold is important — and a key aspect of analysis later in the paper — it is equally crucial to provide an overall estimate of how financial aid loss affects students as a whole. To achieve this, I adopt a multidimensional approach that considers both cumulative GPA and credits completed as running variables. This framework provides an aggregate estimate of aid loss effects, ensuring that the results are not specific to a single eligibility threshold. Later sections of the paper examine heterogeneity in student responses, capturing differences in how students near each threshold react to losing aid.

While the multidimensional RDD framework provides an estimate of the impact of aid loss, it does not fully isolate the causal effects of losing financial aid from other academic challenges. Students who enroll in fewer than 24 credits per year automatically lose eligibility for the TEXAS Grant, regardless of their academic performance. Because these students likely anticipate losing their aid, their enrollment choices may reflect factors unrelated to academic ability, such as financial constraints, work obligations, or personal circumstances. To ensure that the analysis captures the effects of aid loss rather than voluntary reductions in course intensity, I restrict the sample to students who attempted at least 24 credits per year.

Among these students, falling below the credit requirement necessarily implies failing a course.

Course failure may have separate psychological or academic consequences that influence subsequent enrollment, major choice, and graduation outcomes — effects that an RDD would not disentangle. Thus, simply comparing students above and below the thresholds would risk conflating the effects of aid loss with the consequences of course failure itself.

To address this, I incorporate non-TEXAS Grant recipients as a comparison group in a difference-in-discontinuities framework. These non-recipients include both students who received other forms of financial aid and those who did not receive any aid. Given that approximately three-quarters of financial aid recipients receive the TEXAS Grant, restricting the comparison group to only non-TEXAS Grant aid recipients would result in a disproportionately small sample, particularly when examining outcomes further along in students' academic careers. By including students who faced similar academic challenges but were not eligible for the grant, I can net out the direct effects of course failure and isolate the causal impact of financial aid loss.[5] Additionally, I further restrict the analysis to students with no prior course failures and who were enrolled full-time in all semesters leading up to renewal checkpoints.

By implementing these restrictions, I ensure that the analysis captures the effect of losing aid at a critical renewal point, rather than broader trends in academic performance. For example, in the analysis of the second-year renewal benchmark, all included students attempted and passed at least 24 credits in their first year with no failed courses and attempted at least 24 credits in their second year. Similarly, for the third-year benchmark, students must have passed at least 24 credits in their first and second year with no failed zero courses and attempted at least 24 credits in their third year. These restrictions create a more precise counterfactual, improving the ability to estimate the effects of financial aid loss separately from other academic challenges.

Furthermore, not all TEXAS Grant recipients who fall below one of the renewal thresholds ultimately lose the grant in the subsequent year. Figure 2 illustrates the proportion of students who continue to receive the TEXAS Grant in their third year based on each renewal requirement. Among students with cumulative GPAs just below the threshold (less than 0.1 points), approximately 40% still receive the grant, though this proportion drops to 5–10% for those further below the cutoff. In contrast, among students meeting the GPA requirement, 65–90% successfully renew, with most non-renewals occurring due to failure to satisfy the credit requirement. Similarly, for the credit renewal benchmark, 25–50% of students below the threshold retain the grant, whereas over 85% of those meeting the requirement successfully renew. A comparable pattern holds for the third-year GPA and credit renewal benchmarks, as shown in Figure A.1.

One reason some students continue receiving the grant despite failing to meet renewal requirements is the appeal process for aid loss. Students who can demonstrate that they experienced hardships during the year they lost eligibility may retain the grant.[6] Unfortunately, data on appeal

[5]Non-recipients are subject to the same sample restrictions as recipients, including having attended high school in Texas. Out-of-state students would have a significantly higher financial burden, further justifying this restriction. Additionally, when analyzing financial aid outcomes, I assign non-recipients who do not receive financial aid a value of zero for all aid components (grants, loans, and work-study) to ensure consistency in comparisons.

[6]Students must submit a letter of explanation documenting their hardship, which may include severe illness, responsibility for the care of another individual, or loss of a family member, among others.

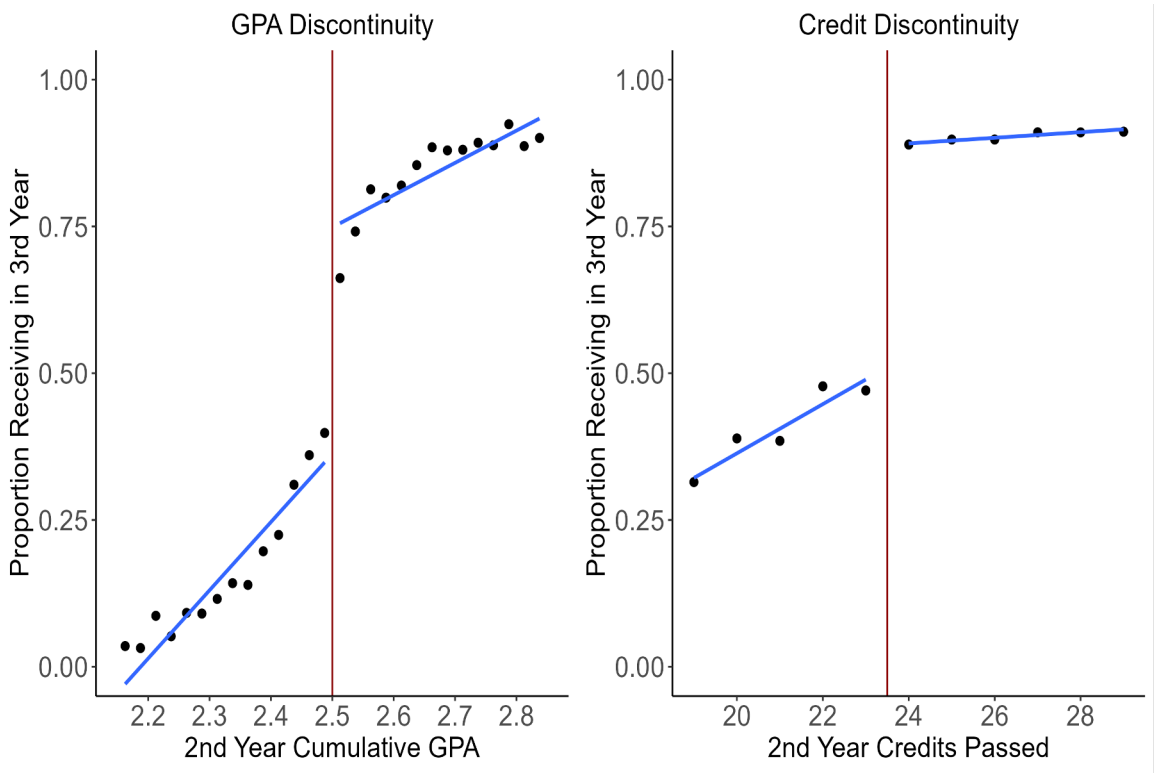


Figure 2. First Stage — Year 2 Benchmark

decisions is not available, making it difficult to assess the extent to which appeals contribute to continued grant receipt.

Additionally, there is no clear evidence that certain universities systematically apply renewal criteria more leniently or have discretionary funds allowing them to extend aid to ineligible students. However, there is a clear relationship between proximity to the renewal threshold and the likelihood of continuing to receive the grant, as students who narrowly fail to meet GPA or credit requirements are more likely to retain the TEXAS Grant than those further below the threshold. This pattern could stem from the appeals process, institutional discretion, or unobserved administrative factors, but the exact mechanisms remain unclear.

However, first-stage estimates confirm that these eligibility thresholds are strong predictors of financial aid renewal, with discontinuities of 42 and 44 percentage points (pp) ($p<.001$) for the second- and third-year GPA requirements, respectively, and 45 and 40 pp ($p<.001$) for the credit requirement. These results validate the use of GPA and credit thresholds as effective instruments for financial aid loss, ensuring that the empirical strategy captures meaningful variation in grant receipt.

Thus, since the renewal requirements do not perfectly predict continued receipt of the TEXAS Grant, my main approach is a fuzzy multidimensional difference-in-discontinuities.[7] I extend the

[7]For non-recipients, the discontinuity is sharp. Since non-recipients never had the TEXAS Grant to begin with, all non-recipients who fall below either requirement are classified as "losing" the grant, while all non-recipients above both thresholds are classified as "retaining" it.

framework of Choi and Lee (2018) and Jones et al. (2021) to accommodate the fuzziness in treatment assignment and the inclusion of non-recipients using the following equation:

$$\begin{aligned} Y_{it} = \alpha + \beta(Lose_{i,t+1} \times Recipient_{it}) + \gamma_1 Lose_{i,t+1} + \gamma_2 Recipient_{it} + \\ f(GPA_{it}, Credits_{it}) + [Recipient_{it} \times f(GPA_{it}, Credits_{it})] + \\ \lambda X_i + \omega W_{i,t-1} + Major_{i,t=1} + Institution_i + Cohort_i + \epsilon_{it} \end{aligned} \tag{1}$$

where Y is an outcome relating to subsequent financial aid, academic outcomes, graduation, major changes, or earnings; *Lose* is an indicator for TEXAS Grant loss, which equals 1 for recipients who lose the grant and for non-recipients who fall below either threshold; *Recipient* is an indicator for TEXAS Grant recipients; and X is a vector of student demographic characteristics including gender, age, race/ethnicity, and family income. W is a vector of pre-renewal academic outcomes including cumulative GPA, credits attempted and passed, and number of math, science, social science, and English credits completed through the year preceding the renewal checkpoint. $Major$, $Insitution$, and $Cohort$ are entry major (2-digit CIP), institution, and cohort fixed effects, respectively. $f()$ accounts for the multidimensional nature of the running variables and is specified as:

$$\begin{aligned} f() = \delta_1 GPA\ Below_{it} + \delta_2 GPA\ Above_{it} + \delta_3 Credits\ Below_{it} + \delta_4 Credits\ Above_{it} + \\ \delta_5(GPA\ Below_{it} \times Credits\ Below_{it}) + \delta_6(GPA\ Above_{it} \times Credits\ Above_{it}) \end{aligned} \tag{2}$$

where *GPA Below* and *Credits Below* are continuous forcing variables equal to centered *GPA* and centered *Credits* if they are below their respective threshold, otherwise 0. *GPA Above* and *Credits Above* are defined analogously for values above their respective threshold.

These continuous forcing variables serve two key purposes. First, they provide flexible control for smooth trends in academic performance just above and below each threshold, ensuring that the estimated effects are not driven by underlying differences in GPA or credit completion. Second, by incorporating both GPA and credit running variables, this specification captures the joint determination of eligibility. The inclusion of interaction terms between GPA and credit thresholds further accounts for cases where students are just above one threshold but just below the other, allowing for a more precise estimation of the effect of aid loss across different academic profiles. *Loss* is instrumented throughout with an indicator for falling below either renewal threshold. The coefficient of interest, β provides the local average treatment effect (LATE) of losing the TEXAS Grant for recipients near at least one renewal threshold.

For the second-year renewal benchmark, students who later lose the grant after their third or fourth year remain in the analysis but are not classified as "treated" (losing the grant) at this stage. That is, this design compares TEXAS Grant recipients (and non-recipients) who lose the grant after the second year to those who do not lose it after the second year. Similarly, for the third-year benchmark, the analysis compares students who lose the grant after the third year to those who do not.[8]

[8] A comparison of students who lose the TEXAS Grant against those who never lose the grant would overestimate

Following Jones et al. (2021), I select bandwidths for each dimensional separately using the bias-corrected optimal bandwidth procedure from Calonico et al. (2014). The resulting bandwidths are 5 credits and 0.35 GPA points for the second-year benchmark and 8 credits and 0.32 GPA points for the third-year benchmark. My primary, or "Full", specification includes students close to either cutoff, as shown by the darker shaded region in Figure 3, which encompasses regions 1,2,3,6,7,8,10, and 11. Among these, students in regions 1,2,3,6,11 fail to meet at least one of the renewal requirements, making them ineligible for continued TEXAS Grant receipt.

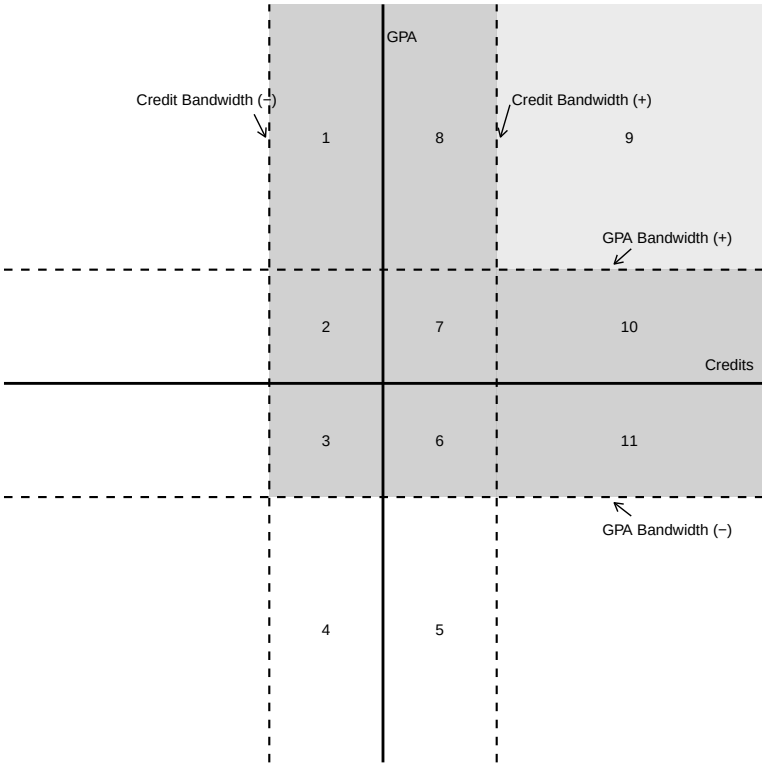


Figure 3. Bandwidths and Specification Illustration

Notes: This figure illustrates the multidimensional design. The horizontal dashed lines represent the GPA bandwidth, while the vertical dashed lines indicate the credit bandwidth. Students far from both cutoffs are excluded — either far above both (region 9) or far below both (regions 4, 5, and all white areas). The included regions for each specification are as follows:

Full: *1,2,3,6,7,8,10,11;* ***Box:*** *2,3,6,7;* ***Credit Discontinuity:*** *1,8;* ***GPA Discontinuity:*** *10,11*

Limiting the analysis to only students close to one of the renewal requirements covers more than one-quarter of all initial TEXAS Grant recipients who entered between fall 2011 and fall 2018. Because this analysis focuses on renewal at the end of the second year, it conditions on students returning for a third year to determine if they retain the TEXAS Grant. As a result, the sample includes 42,503 of the 109,251 (45.6%) initial TEXAS Grant recipients who remain enrolled for at least three years.

The first two columns of Table 1 compare all initial TEXAS Grant recipients to those included

the impact on outcomes such as graduation rates, since continued receipt of the TEXAS Grant is conditional on continued persistence, which is positively correlated with degree completion.

in the second-year benchmark analysis. Recipients in the analysis are slightly younger at their time of application (18.03 vs. 18.08) but are otherwise similar in gender and racial/ethnic composition to the full population of recipients. By design, since the sample excludes early leavers, these students accumulate more first-year credits (28.08 vs. 24.44), have higher first-year GPAs (3.07 vs. 2.71), and graduate at higher rates (88% vs. 66%) than all recipients.

The third column of Table 1 provides descriptives of non-TEXAS Grant recipients in the analysis. While non-recipients are similar in age, their racial/ethnic composition differs markedly from recipients. Specifically, a much larger share of non-recipients are white (52% vs. 18%), while a smaller share are Hispanic/Latino (27% vs. 55%), reflecting broader trends in need-based financial aid receipt. First-year credit accumulation is comparable between recipients and non-recipients, though non-recipients have slightly higher first-year GPAs (3.17 vs. 3.07) and graduate at somewhat higher rates (91% vs. 88%).

Although some observable differences exist between recipients and non-recipients, this does not necessarily pose a threat to identification. What matters is whether both groups exhibit similar patterns at the threshold, ensuring that any observed discontinuities in outcomes are driven by aid loss rather than differential changes in student characteristics. This assumption is tested in later covariate balance analyses to confirm that recipients and non-recipients display similar trends across the renewal cutoffs.

Variable	**All Recipients**	**Recipients in Analysis**	**Non-Recipients in Analysis**
Age	18.08	18.03	18.06
Male	0.42	0.40	0.45
White	0.18	0.18	0.52
Black	0.17	0.16	0.09
Hispanic/Latino	0.55	0.55	0.27
Year 1 Credits Attempted	26.34	28.43	28.65
Year 1 Credits Passed	24.44	28.08	28.35
Year 1 Cumulative GPA	2.71	3.07	3.17
Proportion Graduating	0.66	0.88	0.91
Students	152,837	42,503	146,963

Table 1. Descriptive Statistics of Recipients and Non-Recipients

5.2 Alternative Specifications: Examining Heterogeneous Effects

The "Full" specification contains students with a wide range of academic achievement. For example, a student in region 1 may have attempted 24 credits, failed a one-credit course, and maintained a 3.7 cumulative GPA, yet lose their eligibility for the TEXAS Grant. Conversely, a student in region 11 may have barely passed 30 credits but have a cumulative GPA below a 2.5, also resulting in loss of TEXAS Grant eligibility. In this scenario, it is unlikely loss of aid would

effect both of these students in the same way. While students with higher GPAs may be better positioned academically to persist and have more options for alternative funding, they may also perceive their financial aid as more secure, making the loss more unexpected and potentially more disruptive.

To explore whether effects differ by academic profile, I implement three alternative specifications that segment the full analysis into distinct subgroups. The first specification includes only students close to both cutoffs — the "box" created by regions 2, 3, 6, and 7, which contains 23.2% (43,946) of all students in the second-year benchmark analysis and 14.6% (28,576) of students in the third-year benchmark analysis. The "Box" specification retains the model shown in Equation 1 but restricts the sample to students in these regions, providing the LATE of losing the TEXAS Grant for students who are near both renewal thresholds — i.e., those within the optimal bandwidth for both GPA and credit requirements.

The second specification focuses on students in regions 1 and 8 who are academically successful and well above the GPA threshold but are at risk of losing the TEXAS Grant solely due to failing to pass 24 credits. Because all students in this group meet the GPA benchmark, this analysis reduces to a single-dimensional difference-in-discontinuities using credits passed as the running variable.

For the second-year benchmark, this group includes students who passed between 19 and 29 credits (24 +/- the optimal bandwidth of 5 credits) and maintained cumulative GPAs above 2.85 (2.5 benchmark + the optimal GPA bandwidth of 0.35). This "Credit Discontinuity" specification estimates the LATE of losing the TEXAS Grant for students who performed well academically but lost eligibility due to failing a course(s). This group represents the largest share of the full analysis sample. For the second-year benchmark, 66.9% (126,681) of students in the full analysis fall into this category. The proportion is even higher for the third-year benchmark, where these students make up 82.6% (161,256) of the full analysis.

The final specification mirrors the previous one but instead uses GPA as the running variable in a difference-in-discontinuities framework. This analysis focuses on students in regions 10 and 11, who are close to the GPA benchmark but vary in the number of credits they pass.

Students in this group passed more than 29 credits (24 + the optimal bandwidth of 5 credits) and had cumulative GPAs between 2.15 and 2.85 (2.5 + the optimal bandwidth of 0.35). The "GPA Discontinuity" specification estimates the LATE of TEXAS Grant loss for students who met credit completion requirements but were at risk of aid loss solely due to their GPA. This is the smallest of the three alternative specifications, representing 9.9% (18,831) of students in the second-year analysis and just 2.8% (5,503) in the third-year analysis.

The following equation presents the single-dimensional credit difference-in-discontinuities model:

$$\begin{aligned} Y_{it} = \alpha + \beta(Credit\ Lose_{i,t+1} \times Recipient_{it}) + \phi_1 Credit\ Lose_{i,t+1} + \phi_2 Recipient_{it} + \\ \phi_3 \tilde{R}_{it} + \phi_4(\tilde{R}_{it} \times Credit\ Lose_{i,t+1}) + \phi_5(\tilde{R}_{it} \times Recipient_{it}) + \\ \phi_6(\tilde{R}_{it} \times Credit\ Lose_{i,t+1} \times Recipient_{it}) + \\ \lambda X_i + \omega W_{i,t-1} + Major_{i,t=1} + Institution_i + Cohort_i + \epsilon_{it} \end{aligned} \tag{3}$$

where *Credit Lose* is an indicator for losing the TEXAS Grant (or passing fewer than 24 credits for non-recipients) and $\tilde{R}$ is centered credits passed. *Credit Lose* is instrumented with an indicator for falling below the 24-credit passed threshold. The coefficient of interest, β, provides the LATE of losing the TEXAS Grant due to failing to pass 24 or more credits. The single-dimensional GPA difference-in-discontinuities is analogously defined by substituting GPA for credits in the equation.

5.3 Identifying Assumptions

Similar to an RDD, the validity of the difference-in-discontinuities framework relies on satisfying two key assumptions: (1) continuity in observable characteristics across the threshold and (2) no manipulation of the running variables.

5.3.1 Covariate Balance

For the continuity in observable characteristics, any changes at the thresholds should be similar for both recipients and non-recipients. To test this assumption, I conduct a covariate balance check using the following equation:

$$\begin{aligned} X_{it} = \alpha + \beta(Ineligible_{it} \times Recipient_{it}) + \eta_1 Ineligible_{i,t} + \eta_2 Recipient_{it} + \\ f(GPA_{it}, Credits_{it}) + [Recipient \times f(GPA_{it}, Credits_{it})] \end{aligned} \tag{4}$$

where *Ineligible* is an indicator for falling below either renewal benchmark and X is a vector of student characteristics, previous academic outcomes (previously denoted as $W_{i,t-1}$ in Equation 3), and the institution attended. All other variables retain their previous definitions. In this equation, β captures whether there are systematic changes in student characteristics between recipients and non-recipients at the thresholds.

The four panels of Table 2 present results from the covariate balance equation for the second-year renewal benchmark, examining differences in student demographics, family income, prior academic outcomes, and institution attended. While most characteristics show no significant differences, a few small but notable shifts emerge. The proportion of white students among recipients falling below a renewal threshold is significantly larger (3.3 pp) than among non-recipients, with a corresponding 3.9 pp decrease in the proportion of Hispanic/Latino students. Similarly, the proportion of first-generation students declines by 3.4 pp among recipients at risk of losing aid relative to non-recipients. A small difference also emerges in family income in the lowest income bin — a 1.8 pp increase in the proportion of recipients from families earning below $20,000.[9] While these differences are small in magnitude, they could still have important implications for interpreting later results.

Since the outcomes of interest include credit accumulation, GPA, and graduation rates, any pre-existing differences in academic performance, major selection, or institution attended between recipients and non-recipients across the thresholds could potentially bias estimates. However, as

[9]These family income bins reflect the response categories on student applications.

Panel A: Student Demographics		Panel B: Family Income		Panel C: 1st-Year Academic Outcomes		Panel D: Institution	
Outcome	**Estimate**	**Outcome**	**Estimate**	**Outcome**	**Estimate**	**Outcome**	**Estimate**
Age	-0.004	Unknown	-0.015	STEM Major	0.016	UT-Austin	0.001
	(0.0137)		(0.0148)		(0.0136)		(0.0108)
Male	-0.004	<$20,000	0.018**	Cumulative GPA	0.003	Texas A&M -	0.026***
	(0.0155)		(0.0077)		(0.0078)	College Station	(0.0111)
White	0.033**	$20,000-$39,999	-0.014	Credits Attempted	0.005	UT-Dallas	0.000
	(0.0148)		(0.0094)		(0.1016)		(0.0054)
Black	0.006	$40,000-$59,999	0.007	Credits Passed	0.029	Texas Southern	-0.004
	(0.0094)		(0.0092)		(0.1004)		(0.0030)
Hispanic/Latino	-0.039***	$60,000-$79,999	0.005	Math Credits	0.063	UT-Brownsville	0.000
	(0.0142)		(0.0083)		(0.0939)		(0.0016)
First-Generation	-0.034***	$80,000+	-0.001	Science Credits	0.127	Sul Ross State	0.000
	(0.0108)		(0.0136)		(0.1492)		(0.0014)
N	189,466	**N**	189,466	**N**	189,466	**N**	189,466

Notes: The family income bins in Panel B correspond to the options students can select on their applications. STEM majors include fields related to engineering, biology, mathematics/statistics, and physical sciences. Mathematics and science courses are classified based on subject codes, with mathematics/statistics representing math courses and biology, chemistry, physics, physical sciences, geology, and general science representing science courses. UT-Austin, Texas A&M - College Station, and UT-Dallas have the three highest graduation rates among the schools in this analysis, while Texas Southern, UT-Brownsville, and Sul Ross State have the lowest.
*p<0.10; **p<0.05; ***p<0.01.

Table 2. Covariate Balance Check — Year 2 Benchmark

shown in Panel C, there are no differential changes in STEM representation, GPA, credits attempted or passed, or math and science credits attempted between recipients and non-recipients at the thresholds.[10]

Similarly, to ensure institution-wide graduation rates do not confound the estimated effects of aid loss, Panel D examines changes in the proportion of recipients and non-recipients across the thresholds at the three universities with the highest graduation rates (UT-Austin, Texas A&M - College Station, and UT-Dallas) and those with the lowest graduation rates (Texas Southern, UT-Brownsville, and Sul Ross State). While Texas A&M sees a slightly larger proportion (2.6 pp) of recipients falling below the threshold, this difference is small in magnitude and is unlikely to drive effects. Moreover, since institution fixed effects are included in all specifications, the analysis compares students within the same university, ensuring that the estimated effects of aid loss are not driven by differences in institutional characteristics.

Table A.1 shows that patterns in student demographics, family income, and institution attended for the third-year benchmark are similar to, or in some cases more balanced than, those in the second-year benchmark. However, there are notable differences in academic outcomes through

[10]STEM majors are defined according to the Department of Homeland Security's STEM Designated Degree Program list that includes majors under the following four primary CIP 2-digit series: 14 (Engineering), 26 (Biological and Biomedical Sciences), 27 (Mathematics and Statistics), and 40 (Physical Sciences) (Department of Homeland Security, 2023).

two years between recipients and non-recipients across the threshold. Specifically, recipients below either renewal threshold have slightly higher GPAs (0.020 points) and pass 0.37 more credits on average than their non-recipient counterparts.

Across both renewal benchmarks, there are some small but notable differences in student characteristics and academic performance between recipients and non-recipients at the threshold. However, these differences generally favor recipients who fail to renew, suggesting that estimated effects of aid loss are unlikely to be driven by pre-existing disadvantages. The one exception is family income, where recipients falling below the second-year threshold were slightly more likely to come from the lowest income bracket. This could introduce some differential financial constraints, though the magnitude of this shift is small. Overall, while these differences should be kept in mind when interpreting results, they are unlikely to be the primary drivers of the estimated effects of aid loss.

5.3.2 No Manipulation

Second, recipients must not be able to differentially manipulate either of the running variables. While some degree of sorting or strategic behavior may occur, what matters for identification is that any bunching or discontinuities at the threshold are similar for both recipients and non-recipients. If, for example, recipients disproportionately clustered just above the GPA renewal threshold while non-recipients were evenly distributed, this would suggest differential sorting that could bias estimates.

The two graphs in the left panel of Figure 4 plot the density of cumulative GPA for TEXAS Grant recipients and non-recipients at the second-year renewal benchmark. Visual inspection confirms that both groups exhibit similar density patterns around the threshold, suggesting no systematic manipulation of GPA. This is expected, as students cannot precisely control their cumulative GPA. Additionally, unlike prior research documenting bunching at GPA values corresponding to standard letter grades (Barreca et al., 2016) — a pattern often observed in first-year GPA distributions due to grading scales and fewer courses contributing to GPA — there is no evidence of similar bunching at the second- and third-year renewal thresholds.

The right panel of Figure 4 plots the distribution of students passing between 18 and 30 credits. If the renewal requirement were based on attempted credits, direct manipulation would be a major concern, as students could strategically adjust their course loads to stay above the threshold. However, just as students cannot directly manipulate their GPA, they also cannot directly manipulate passing a course. A student failing a course would have to convince an instructor to retroactively change their failing grade.[11] In theory, a student could attempt an extreme number of credits (e.g., 42) to increase the likelihood of passing at least 24, but this would be highly unusual given typical course loads and the risk of lowering their GPA below a 2.5 should the workload become unmanageable. That said, there is visible bunching of students at and just above the 24-credit threshold. This is expected, as more students pass all of their courses than fail at least one. Critically, the

[11] While both are unlikely, persuading a professor to round up a final grade is a much lower hurdle than overturning a failing course outcome.

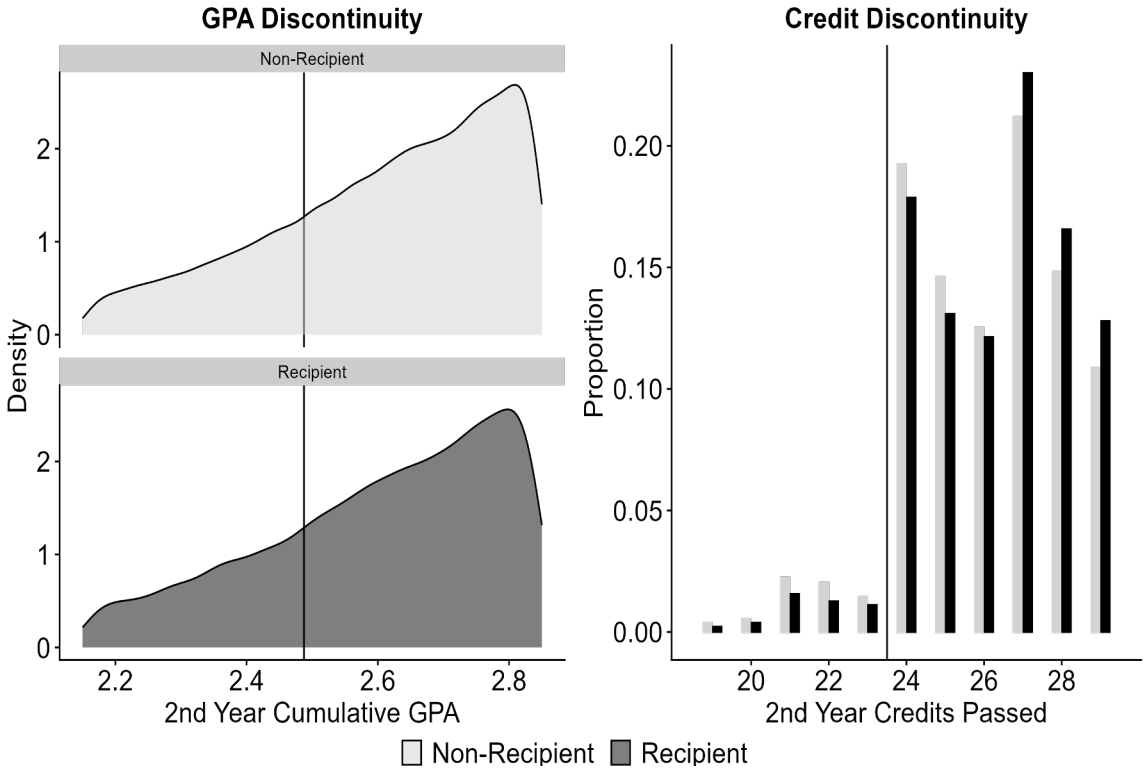


Figure 4. Density Plots — Year 2 Benchmark

density shift across the threshold is nearly identical for both recipients and non-recipients, indicating no differential manipulation. Thus, while there is some natural clustering around the cutoff, the pattern across groups suggest that the manipulation assumption holds.[12]

Figure A.2 presents density plots for the third-year renewal thresholds. Since only TEXAS Grant recipients were previously subject to a second-year cumulative GPA requirement, the higher concentration of recipient third-year cumulative GPAs above a 2.5, as seen in the left two graphs, is expected. With no noticeable jump in density across the threshold for either group, differential manipulation of GPA appears unlikely.

However, the right-side graph reveals a notable difference: a larger proportion of non-recipients passed 24 or more credits, while a slightly smaller share completed between 18 and 23 credits. This suggests some form of differential movement across the credit threshold, though notably, it is not driven by recipients. While, to the best of my knowledge, non-recipients lack a direct incentive to manipulate their credit accumulation in the same way recipients might, one possible explanation is institutional policies that affect students outside the TEXAS Grant program. For instance, some students may be subject to credit requirements tied to other forms of aid or academic standing policies, which could disproportionately influence credit accumulation patterns among non-recipients.

[12] A more formal density test is forthcoming for both running variable. While the McCrary density test (McCrary, 2008) is the standard approach for detecting discontinuities in running variables, it does not test for differences in manipulation across groups.

Crucially, while this pattern indicates a differential change in density across the threshold, it does not appear to reflect strategic manipulation in response to the TEXAS Grant renewal requirements specifically. Since the identifying assumption primarily concerns the absence of recipient-driven manipulation, this pattern does not necessarily threaten identification. Nonetheless, the presence of this differential shift warrants further examination, and forthcoming formal tests will provide additional insight into its implications.

6 Results

6.1 Second-Year Renewal Benchmark

6.1.1 Financial Aid

Table 3 presents the estimated impact of losing the TEXAS Grant after the second year on subsequent financial aid. Panel A reports effects on third-year financial aid, while Panel B shows effects on fourth-year financial aid for students who remain enrolled. Each column corresponds to one of the four specifications discussed in the previous section. It is important to note that the estimates from the "Full" specification are not a weighted average of the three alternative specifications, even though the alternative specifications fully partition the full analysis sample. This is because the "Full" and "Box" specifications are estimated using the multidimensional difference-in-discontinuities approach, whereas the "Credit Discontinuity" and "GPA Discontinuity" specifications use single-dimensional models. As a result, their estimates are not directly comparable in a simple additive way. Rather, the "Full" specification captures the overall effect of aid loss, while the alternative specifications explore heterogeneity in responses based on whether students were close to the GPA threshold, the credit threshold, or both.

Across all specifications, losing the TEXAS Grant significantly reduces total third-year financial aid. The decrease in aid ranges from \$2,944 for students who narrowly missed both renewal thresholds ("Box") to \$5,650 for students who satisfied the credit requirement but fell below the GPA benchmark ("GPA Discontinuity"). The primary driver of this reduction is the \$5,500–\$6,500 loss from the TEXAS Grant, but students replace some of this lost funding through other sources of grant aid. In the "Full" and "Box" specifications, students offset approximately \$1,000 of the lost TEXAS Grant aid with other grants.[13] Students also turn to loans to compensate for the lost TEXAS Grant aid, though borrowing responses differ based on which renewal requirement was not met. With the exception of students who just missed the GPA threshold, students increase borrowing by \$1,690 to \$2,815, partially offsetting another portion of their lost aid.

This variation in responses suggests that students failing only the GPA requirement may face greater constraints in accessing alternative financing options. Unlike students who fail the credit requirement but remain in good academic standing, students near the GPA threshold may have difficulty securing other forms of grant aid, many of which have merit-based eligibility criteria. At

[13] Future iterations of this work will explore the sources of this other grant aid.

the same time, these students may be less willing to take on additional loans, either due to risk aversion related to academic struggles or concerns about their ability to meet SAP requirements for future borrowing. In contrast, students who meet the GPA requirement but fail the credit benchmark may be more confident in continuing their education, viewing the earnings premium associated with degree completion as justification for taking on additional debt. Work-study earnings and outside employment do not meaningfully change in response to financial aid loss.

Aid Component	Specification			
	Full	**Box**	**Credit Discontinuity**	**GPA Discontinuity**
Panel A: 3rd-Year Financial Aid				
Total Aid	-3485***	-2944***	-3663***	-5650***
	(421)	(652)	(765)	(1113)
Gift Aid	-5178***	-5122***	-6424***	-5814***
	(269)	(413)	(527)	(716)
TEXAS Grant	-6169***	-6019***	-5520***	-6404***
	(76)	(112)	(171)	(196)
Loans	1690***	2044***	2815***	189
	(318)	(492)	(559)	(844)
Work-Study	3	133	-54	-26
	(66)	(101)	(119)	(181)
Earnings	49	106**	-54	-79
	(31)	(52)	(63)	(60)
N	189,466	43,954	126,681	18,831
Panel B: 4th-Year Financial Aid				
Total Aid	-1615***	-732	-440	-3477***
	(481)	(765)	(864)	(1289)
Gift Aid	-2653***	-1794***	-3321***	-2483***
	(334)	(535)	(655)	(871)
TEXAS Grant	-2751***	-1643***	-2429***	-2251***
	(162)	(256)	(326)	(442)
Loans	1037***	1029*	2857***	-1127
	(344)	(531)	(603)	(915)
Work-Study	1	33	24	133
	(64)	(100)	(127)	(171)
Earnings	67*	56	46	66
	(38)	(57)	(77)	(77)
Loans After Benchmark	1503	2876*	7290***	-5453*
	(1093)	(1671)	(2078)	(2910)
N	163,179	38,670	109,436	15,073

Notes: 4th-year financial aid estimates are only provided for students who enroll a fourth year. "Loans After Benchmark" is the cumulative loan amount students take out after their second year.
*p<0.10; **p<0.05; ***p<0.01.

Table 3. Effects of TEXAS Grant Loss on Subsequent Financial Aid — Year 2 Benchmark

By the fourth year, the effect of losing the TEXAS Grant on total aid diminishes in magnitude. Reductions for the "Full" and "GPA Discontinuity" are $1,615 and $3,477 — approximately half the size of the third-year estimates. For the remaining specifications, there is no significant effect on total aid. This attenuation is largely due to a smaller direct effect of TEXAS Grant loss, as some students retain the grant through their third year but lose it afterward. That is, the effect

on third-year aid captures the impact of losing aid after the second year compared to students who retained it for a third year. In contrast, the fourth-year estimate captures the impact of losing aid after the second year compared to students who either retained it for four (or more) years or lost it after their third year. Since some students who lost their TEXAS Grant after their third year are included in the control group for the fourth-year estimate, the average effect of losing aid after the second year is smaller in the fourth year than in the third year.

Consistent with third-year trends, students continue to rely on loans to cover some of the lost aid, but there is still no evidence that they increase work-study participation. In the "Full" specification, there is a modest $67 increase in outside employment earnings, but this represents only 2.4% of the lost TEXAS Grant aid, suggesting that students either do not or cannot compensate for lost grant aid through additional participation in traditional employment.

The final row of Panel B examines the cumulative impact of TEXAS Grant loss on loan borrowing after the second year. Notably, students who failed to meet only the credit benchmark ("Credit Discontinuity") take out $7,290 in additional loans, while students close to both thresholds take out an additional $2,876. The "Full" specifications reveals no significant change in borrowing patterns, while the "GPA Discontinuity" shows a marginally significant decrease in subsequent loans of $5,453. Although estimates on third- and fourth-year loan balances are positive and significant in the "Full" specification, the impact on total subsequent loans is insignificant. One possible explanation is that students facing aid loss may leave college earlier, either by dropping out or graduating sooner, reducing their need for additional loans. These outcomes are explored in later sections on persistence and degree completion.

Overall, regardless of which renewal requirement a student fails to meet, losing the TEXAS Grant leads to a substantial reduction in total financial aid, with students primarily turning to loans rather than other grants or earnings from work-study or outside employment to replace a portion of lost funds. However, the differences in borrowing responses suggest that students adjust to aid loss differently based on their academic standing.

6.1.2 Academic Outcomes

Table 4 presents the estimated effects of losing the TEXAS Grant on subsequent academic outcomes. The first two rows of Panel A examine whether the decrease in total financial aid is associated with lower attendance costs attributable to course withdrawals or decreased enrollment intensity. While there is no significant impact on the number of credits withdrawn, there is a substantial decline in enrollment intensity. Among students close to one of the renewal thresholds, full-time enrollment — defined as attempting at least 24 credits during the academic year — decreased by 7.5 pp. This effect is even larger for students only near the credit benchmark, where full-time enrollment drops by 29.1 pp.

The reduction in full-time enrollment translates into fewer credits attempted and passed. Students close to at least one threshold attempt 0.80 fewer credits and pass 1.02 fewer credits, while those near only the credit benchmark attempt 2.65 fewer credits and pass 4.04 fewer credits. Es-

timates from the credit difference-in-discontinuities specification suggest that affected students are not only attempting fewer credits but also experiencing worse academic performance, as seen in the 0.431-point decline in their third-year GPA.[14] Students near both thresholds or only near the GPA threshold do not experience significant decreases in withdrawals, enrollment intensity, credit accumulation, or GPA.

Outcome	Specification			
	Full	**Box**	**Credit Discontinuity**	**GPA Discontinuity**
Panel A: 3rd-Year Academic Outcomes				
Credits Withdrawn	-0.058	0.066	0.198	-0.143
	(0.168)	(0.264)	(0.272)	(0.451)
Full-Time Enrollment	-0.075***	-0.013	-0.291***	-0.064
	(0.027)	(0.043)	(0.050)	(0.061)
Credits Attempted	-0.795*	-0.164	-2.651***	-0.745
	(0.435)	(0.656)	(0.789)	(1.167)
Credits Passed	-1.023**	-0.160	-4.035***	-1.119
	(0.499)	(0.768)	(0.877)	(1.320)
GPA	0.003	0.059	-0.431***	-0.086
	(0.044)	(0.070)	(0.081)	(0.105)
N	189,466	43,954	126,681	18,831
Panel B: 4th-Year Academic Outcomes				
Persistence	-0.029*	-0.028	-0.132***	0.027
	(0.017)	(0.025)	(0.030)	(0.046)
Credits Withdrawn	-0.058	-0.052	0.335	-0.170
	(0.144)	(0.233)	(0.264)	(0.356)
Full-Time Enrollment	-0.031	0.042	-0.238***	-0.078
	(0.028)	(0.044)	(0.052)	(0.074)
Credits Attempted	-0.404	0.269	-2.337***	-0.408
	(0.500)	(0.770)	(0.864)	(1.283)
Credits Passed	-0.596	0.535	-3.572***	-0.562
	(0.557)	(0.872)	(0.953)	(1.390)
GPA	-0.016	0.087	-0.270**	-0.001
	(0.051)	(0.081)	(0.095)	(0.128)
N	163,179	38,670	109,436	15,073

Notes: "Credits Withdrawn" is the credit value of total withdraws during the given academic year. "GPA" only considers courses during the given year, not cumulative GPA. 4th-Year academic outcomes are conditional on persisting.
*p<0.10; **p<0.05; ***p<0.01.

Table 4. Effects of TEXAS Grant Loss on Subsequent Academic Outcomes — Year 2 Benchmark

Panel B of Table 4 contains results on fourth-year academic outcomes and persistence. Students most affected by aid loss in the third year continue to experience negative impacts in the fourth year, both in persistence and academic performance among those who remain enrolled. In the "Full"

[14]This is GPA only during the third year, not cumulative GPA at the end of the third year.

and "Credit Discontinuity" specifications, persistence decreases by 2.9 pp and 13.2 pp, respectively. For context, 94.4% of third-year TEXAS Grant recipients persist to a fourth year, highlighting that while many affected students remain enrolled, their likelihood of persisting is meaningfully lower relative to recipients. This suggests that, beyond affecting students' credit accumulation and enrollment intensity, losing the TEXAS Grant also influences the re-enrollment margin, making affected students more likely to leave college altogether.

Among students who do persist, academic disruptions remain substantial in the "Credit Discontinuity" specification. Full-time enrollment drops by 23.8 pp ($p<0.01$), with students attempting and passing 2.34 and 3.57 fewer credits, respectively. Academic performance also suffers, with fourth-year GPA declining by 0.270 points. As in the third year, students near both thresholds or only near the GPA threshold do not experience significant declines in academic outcomes.

These results highlight several important insights. First, students who were only near the GPA threshold — despite experiencing the largest reductions in financial aid — show no negative effects on subsequent academic outcomes. This is particularly notable given that they were the only group that did not increase borrowing to compensate for lost grant aid. One possible interpretation is that higher loan balances may be driving the observed negative effects on academic performance for other students. However, it is also possible that power limitations prevent significant effects from being detected, as estimates for third-year outcomes are similar in magnitude across specifications, but the sample size for this group is much smaller.

Second, the effects of financial aid loss vary significantly depending on which renewal threshold students were close to. Comparing students near both thresholds to those only near the credit benchmark, we see that while TEXAS Grant loss led to similar reductions in financial aid, academic impacts were drastically different. Students in the "Box" specification (those near both thresholds) experience no significant academic consequences, while higher-achieving students in the credit discontinuity specification suffer large declines in enrollment intensity, credit accumulation, GPA, and persistence.

This finding underscores an important yet underappreciated consequence of financial aid loss: it does not only affect academically struggling students. In fact, these results suggest the opposite — academically successful students, particularly those who maintained a strong GPA but fell short on credit requirements, may suffer the most when aid is lost. A key reason for this may be the unexpected nature of aid loss for higher-achieving students, who may have assumed their financial aid was secure throughout college. Beyond the initial shock, the burden of higher loan balances discussed earlier may have further exacerbated the academic challenges for these students. The need to manage higher debt burdens may have contributed to declining academic confidence and performance, as financial stress and uncertainty about repayment weighed on their ability to focus on coursework.

6.1.3 Graduation

Table 5 presents estimates on overall graduation rates, four-, five-, and six-year graduation rates, and time to graduation. Results from the "Full" specification indicate that losing the TEXAS Grant increased four-, five-, and six-year graduation rates by 8.6–12.3 pp but did not significantly affect the likelihood of ever earning a bachelor's degree. Pairing these results with the marginally significant 2.59 month reduction in time to graduation suggests that some students accelerated degree completion.

At first glance, this result may seem contradictory given the null or negative impacts on third- and fourth-year academic outcomes. However, this pattern may reflect contrasting responses within the group of students who lost the TEXAS Grant. Some students reduced enrollment intensity but eventually graduated. Others may have actively accelerated their progress to completion. While this specific measure was not included in the earlier academic outcomes table, loss of the TEXAS Grant did lead to a 4.1 pp ($p<0.05$) increase in the likelihood of attempting at least 36 credits during the fourth year. This suggests that a subset of students responded to aid loss by taking heavier course loads, likely in an effort to graduate soon and reduce additional borrowing.

	Specification			
Outcome	**Full**	**Box**	**Credit Discontinuity**	**GPA Discontinuity**
Graduate in 4 Years	0.086**	0.081	-0.042	-0.026
	(0.0380)	(0.0564)	(0.0518)	(0.0756)
N	189,466	43,954	126,681	18,831
Graduate in 5 Years	0.142***	0.078	-0.242***	0.025
	(0.0436)	(0.0669)	(0.0537)	(0.0711)
N	166,441	39,887	109,381	17,173
Graduate in 6 Years	0.123***	0.100	-0.225***	-0.003
	(0.0444)	(0.0679)	(0.0520)	(0.0654)
Bachelor's Degree	0.057	0.041	-0.145***	-0.002
	(0.0401)	(0.0618)	(0.0464)	(0.0589)
N	141,544	34,614	91,961	14,969
Time to Graduate (Months)	-2.588*	-2.239	3.384**	0.194
	(1.3604)	(2.1980)	(1.6617)	(1.9886)
N	157,758	32,571	109,396	15,791

Notes: Four-year graduation rates include all cohorts; five-year graduation rates omit the fall 2018 entry cohort as spring 2023 graduation records are not yet available; six-year graduation rates and degree attainment further omit the the fall 2017 entry cohort. Time to graduation only includes graduates, using the month and year of their graduation and assumes a uniform starting month of September for all universities. *p<0.10; **p<0.05; ***p<0.01.

Table 5. Effects of TEXAS Grant Loss on Graduation Outcomes — Year 2 Benchmark

By contrast, the graduation outcomes for students near only the credit renewal threshold align closely with their earlier academic disruptions. Unlike the "Full" specification, these students did not experience an increase in on-time graduation rates. Instead, loss of the TEXAS Grant decreased

five- and six-year graduation rates by 24.2 pp and 22.5 pp, respectively. Furthermore, rather than delaying degree completion beyond six years, the rate of ever earning a bachelor's degree fell by 14.5 pp. To frame this impact, among recipients who did not lose the grant, 94.2% eventually earned a bachelor's degree, highlighting that while many students who lost the TEXAS Grant still graduate, their likelihood of doing so is substantially lower.

At the same time, among those who do graduate, losing aid is associated with a longer time to completion, increasing average time to degree by 3.38 months. This suggests that aid loss affected these students through two channels: some leave college altogether, while others reduce their enrollment intensity — some of whom eventually drop out while others graduate — resulting in both lower rates of degree attainment and an extended time to graduation.

The observed graduation patterns are further reflected in post-renewal borrowing behavior. While Table 3 previously showed overall loan uptake increased after aid loss for students near just the credit threshold or both thresholds, breaking out loans by graduation status reveals an even more nuanced pattern. In the "Full" specification, total subsequent loans for graduates did not significantly increase, while the effect for students near the credit renewal threshold was an additional \$11,636 ($p<0.01$) in loans. This suggests that credit-threshold students who persisted to graduation faced greater financial strain and relied more heavily on borrowing to remain enrolled, further highlighting the challenges of sustaining enrollment without grant aid.

For students in the "Box" and "GPA Discontinuity" specifications, the absence of significant impacts on third- and fourth-year academic outcomes makes it unsurprising that graduation rates were similarly unaffected. With no evidence of enrollment intensity shifts, declines in persistence, or changes in GPA, these students also appear to have been less sensitive to financial aid loss in terms of degree completion. These results further reinforce the idea that financial aid loss led to diverging responses among affected students.

6.1.4 Major Change

Financial aid loss can create strong incentives for students to reevaluate their major selection. The findings from earlier sections show that some students responded to losing the TEXAS Grant by accelerating degree completion by taking heavier course loads, while others relied more heavily on loans to maintain enrollment. These diverging responses create two possible mechanisms for major switching following aid loss.

First, students who increased their course loads in an effort to graduate sooner may have switched to less demanding majors to accommodate a heavier schedule. If students sought to reduce time-to-degree, they may have moved away from majors with intensive credit requirements, high failure rates, or required sequenced coursework (e.g., STEM) and instead selected fields that allowed for quicker completion. This aligns with research showing that students often adjust their academic plans to better fit their personal and academic situations (Denice, 2021).

At the same time, the increased reliance on student loans among some students introduces a competing incentive that may push students toward higher-earning majors. With a greater share

of their education now financed through borrowing, students may be more concerned about future earnings potential and loan repayment burdens. This could lead them to switch into traditionally high-paying fields that offer stronger labor market returns.

These two competing mechanisms suggest that major changes after financial aid loss may not follow a single pattern. Instead, the direction of major switching may depend on students' individual responses to aid loss. Those prioritizing early graduation may move toward less credit-intensive fields, while those focusing on future financial stability may shift toward majors with greater earnings potential.

To explore this, Table A.2 presents estimated impacts on the likelihood of a student changing majors in the year following the loss of the TEXAS Grant, two years after aid loss (conditional on remaining enrolled), and by graduation (conditional on graduating) as effects on loans differed when focusing only on graduates. Additionally, for students who did change majors during these intervals, the table reports estimates on movement to and from STEM majors.

Across all specifications, there are no significant effects on the overall likelihood of a student changing their major following the loss of financial aid. This suggests that, despite the clear financial and academic adjustments students made in response to aid loss, these changes did not systematically alter students' field of study.

However, among students who changed majors two years after losing aid, there is some evidence of STEM avoidance. In the "Full" specification, students who switched majors were 3.5 pp less likely to move into a STEM major, possibly reflecting an effort to avoid more difficult coursework that could delay graduation. Additionally, students near only the credit discontinuity who changed majors were a marginally significant 12.6 pp more likely to switch from a STEM to a non-STEM major. This movement away from STEM is marginally significant for graduates at 14.1 pp, suggesting a considerable shift in career trajectories. This is particularly interesting for these students given that they also accumulated the most student debt. This suggests that students facing higher debt burdens may not have prioritized earnings when switching majors.

Despite these suggestive findings, the lack of significant effects on overall major switching behavior suggests that students did not broadly adjust their fields of study in response to financial aid loss. While financial constraints may influence students' enrollment intensity, borrowing behavior, and persistence, they do not appear to systematically affect major choice in a meaningful way. This may indicate that students' initial major choices were already aligned with their long-term goals, financial constraints, or perceived academic strengths, making them less responsive to financial aid shocks.

6.1.5 Early-Career Earnings

Earnings outcomes reflect the combined effects of aid loss on educational attainment and changes in major/career trajectory. Given that losing the TEXAS Grant negatively impacted degree attainment in some specifications, the overall estimates capture a mix of two opposing forces: (1) lower earnings for students who did not complete their degree, and (2) higher earnings for students

who took on more loans.

To separate these dynamics, Table A.3 presents earnings estimates one, two, and three years after students finish enrollment, both for all students and for graduates only. Point estimates for students near only the credit discontinuity are consistently large and negative, though only marginally significant (-$5,497, $p< 0.10$) in the first year for the analysis on all students. Estimates from all other specifications are insignificant and show no consistent pattern across years, suggesting no detectable effects within this analysis window, though patterns may emerge over a longer observation period.

6.2 Third-Year Renewal Benchmark

Having established the consequences of losing the TEXAS Grant after the second year, this section examines whether similar patterns emerge for students facing aid loss after the third year. While many of the same mechanisms may be at play, students losing aid at this checkpoint have persisted further in college, potentially signaling greater academic commitment and providing them with fewer opportunities to adjust their academic plans without delaying graduation. However, losing aid this late in their college career may come as a greater shock, leaving them with fewer alternative funding options and making continued enrollment more reliant on loans. As a result, aid loss at this stage may pose a more significant barrier to degree completion.

6.2.1 Financial Aid

Table 6 presents estimates on the effects of losing the TEXAS Grant after the third-year renewal checkpoint on fourth-year financial aid. For most students, total financial aid declines by $2,600 to $2,900, slightly smaller than the estimates for third-year aid loss reported in Table 3. However, the effect for students only near the GPA discontinuity is much larger, exceeding $14,000 in lost aid. These students not only lost over $4,600 from the TEXAS Grant but also experienced an additional $2,500 decrease in other grants.

Unlike other students, those only close to the GPA discontinuity did not offset lost aid with increased borrowing — the large negative but insignificant estimate on loans indicates that they did not take out more loans to compensate. In contrast, all other students followed a similar pattern to those who lost the TEXAS Grant after their second year — a portion of lost aid was covered by other gift aid and another portion was replaced with higher loan borrowing ($1,500-$2,000), leading to a smaller net reduction in total aid relative to the amount lost from the TEXAS Grant. However, effects on total loans after the renewal point remain insignificant across all specifications, suggesting that overall borrowing adjustments were limited at this stage.

6.2.2 Academic Outcomes

Table 7 presents estimates of the effects of aid loss after the third-year renewal checkpoint on fourth-year academic outcomes. Similar to the second-year renewal estimates in Table 4, the overall

Aid Component	Specification			
	Full	**Box**	**Credit Discontinuity**	**GPA Discontinuity**
Total Aid	-2680***	-2885***	-2841***	-14053**
	(642)	(939)	(460)	(6285)
Gift Aid	-4226***	-4805***	-4347***	-7429**
	(450)	(610)	(339)	(3505)
TEXAS Grant	-5981***	-5895***	-5716***	-4689***
	(122)	(163)	(104)	(1051)
Loans	1526***	1910***	1472***	-6733
	(444)	(668)	(308)	(4867)
Work-Study	20	10	34	109
	(87)	(132)	(64)	(905)
Earnings	45	31	24	-265
	(61)	(71)	(57)	(278)
Loans After Renewal	1106	2984	2164**	-17288
	(1428)	(1997)	(1073)	(12737)
N	195,335	28,576	161,256	5,503

"Loans After Benchmark" is the cumulative loan amount students take out after their third year.
*p<0.10; **p<0.05; ***p<0.01.

Table 6. Effects of TEXAS Grant Loss on Subsequent Financial Aid — Year 3 Benchmark

negative effects are driven primarily by students only near the credit discontinuity, while those close to both thresholds or only the GPA threshold do not experience significant academic disruptions.

Outcome	Specification			
	Full	**Box**	**Credit Discontinuity**	**GPA Discontinuity**
Credits Withdrawn	0.555***	0.498	0.297**	0.042
	(0.213)	(0.337)	(0.134)	(1.297)
Full-Time Enrollment	-0.135***	-0.067	-0.181***	0.721*
	(0.040)	(0.057)	(0.028)	(0.388)
Credits Attempted	-1.401**	-1.143	-1.437***	0.603
	(0.632)	(0.909)	(0.431)	(6.626)
Credits Passed	-2.051***	-1.548	-1.978***	3.050
	(0.681)	(1.006)	(0.450)	(7.058)
GPA	-0.252***	-0.171*	-0.260***	0.205
	(0.061)	(0.097)	(0.042)	(0.565)
N	195,335	28,576	161,256	5,503

Notes: "Credits Withdrawn" is the credit value of total withdraws during the given academic year. "GPA" only considers courses during the given year, not cumulative GPA.
*p<0.10; **p<0.05; ***p<0.01.

Table 7. Effects of TEXAS Grant Loss on Subsequent Academic Outcomes — Year 3 Benchmark

In the "Full" specification, losing financial aid leads to a significant 0.56 increase in withdrawn credits, an 13.5 pp decrease in full-time enrollment, a 1.40 credit decline in attempted coursework, and a larger 2.05 decrease in credits passed, suggesting that students not only enroll in fewer courses but also struggle to complete them successfully. This is reflected in a 0.252 point decline in fourth-year GPA, reinforcing the academic challenges faced by students who lose financial aid at this stage.

For students just around the credit discontinuity, similar patterns emerge, with a marginally significant 0.30 credit increase in withdrawals, an 18.1 pp decline in full-time enrollment, a 1.44 drop in attempted credits, and a 1.98 decline in credits passed. Again, this suggests that students are not only taking fewer courses but also failing more of the courses they do take, which is further reflected in a -0.260 point decline in fourth-year GPA.

Connecting the financial aid results in Table 6, the $2,841 decrease in total aid for students with a third-year cumulative GPA above 2.85 ("Credit Discontinuity") — who had successfully maintained full-time enrollment for three years — translates into substantial academic setbacks. Losing financial aid this late in a student's academic career appears to disrupt progress toward degree completion, highlighting that even students who have persisted for three years are not necessarily insulated from the negative effects of aid loss. These findings further emphasize that financial stability remains critical for academic success, even as students near graduation.

6.2.3 Graduation

The effects of losing the TEXAS Grant after the third-year renewal checkpoint are presented in Table 8. Unlike the second-year renewal results, financial aid loss after the third year significantly reduced timely graduation rates for all students near at least one renewal threshold. Specifically, four-, five-, and six-year graduation rates decreased by 10.5, 18.6, and 8.2 pp, respectively, though overall degree attainment was not significantly impacted.

At this later stage in students' academic careers, the decrease in enrollment intensity and credit accumulation documented in Table 7 appears to have any effort by a portion of students to accelerate their progress toward graduation. Unlike students who lost aid after their second year, who could increase their course loads to complete their degrees within four years, students facing third-year aid loss had less flexibility to adjust their credit accumulation in a single remaining year. This is further supported by the absence of significant estimates on the likelihood of attempting at least 36 credits during the fourth year across any specification (not shown), in contrast to the second-year benchmark analysis, where some students increased course loads to stay on track. As a result, they were unable to compensate for the loss of financial aid by accelerating completion, leading to significant delays in degree attainment. Consistent with this, students who eventually graduated took an additional 2.91 months to do so, indicating that the decline in fourth-year credit accumulation translated directly into a longer time to graduate.

While fourth-year loan balances and time to graduation increased for students who lost the TEXAS Grant after three years, total post-renewal loans for those who graduated did not signifi-

Outcome	Specification			
	Full	**Box**	**Credit Discontinuity**	**GPA Discontinuity**
Graduate in 4	-0.105***	-0.088*	0.004	0.417
	(0.0365)	(0.0489)	(0.0293)	(0.4490)
N	195,335	28,576	161,256	5,486
Graduate in 5	-0.186***	-0.164***	-0.183***	0.170
	(0.0406)	(0.0623)	(0.0276)	(0.2852)
N	168,841	26,181	137,594	5,066
Graduate in 6	-0.082**	-0.076	-0.108***	0.142
	(0.0355)	(0.0596)	(0.0216)	(0.2253)
Bachelor's	-0.039	-0.081	-0.042**	0.087
	(0.0298)	(0.0509)	(0.0175)	(0.2040)
N	143,712	23,246	115,985	4,481
Time to Graduate (Months)	2.905**	2.875	1.946**	-7.134
	(1.1563)	(1.9220)	(0.7575)	(9.1049)
N	175,227	22,624	147,611	5,064

Notes: Four-year graduation rates include all cohorts; five-year graduation rates omit the fall 2018 entry cohort as spring 2023 graduation records are not yet available; six-year graduation rates and degree attainment further omit the the fall 2017 entry cohort. Time to graduation only includes graduates, using the month and year of their graduation and assumes a uniform starting month of September for all universities. *p<0.10; **p<0.05; ***p<0.01.

Table 8. Effects of TEXAS Grant Loss on Graduation Outcomes — Year 3 Benchmark

cantly increase. This pattern suggests that graduates may have adjusted their borrowing behavior over time — taking on more loans in their fourth year, but later limiting additional debt accumulation by further reducing their course loads. While this may have lowered their tuition expenses, it likely contributed to lower timely graduation rates and longer time to degree completion.[15]

Students near only the credit discontinuity were similarly less likely to graduate within five or six years, with graduation rates decreasing by 18.3 pp and 10.8 pp, respectively, though their four-year graduation rates were not significantly impacted. Additionally, a significant 4.2 pp decline in ever earning a bachelor's degree highlights the critical role of financial aid stability — aid loss at this stage prevented some students who had successfully completed three years of college from obtaining their degrees.

For students near both the GPA and credit discontinuities, there is also evidence of negative effects, including an 8.8 pp ($p<0.10$) decline in four-year graduation rates and 16.4 pp ($p<0.01$) decrease in five-year graduation rates, though no statistically significant impacts on overall graduation rates are observed. There are no significant impacts for students only around the GPA threshold.

[15]Future iterations of this work will examine these longer-term borrowing patterns in greater detail.

6.2.4 Major Change

Appendix Table A.4 presents estimated effects of losing the TEXAS Grant after the third-year renewal checkpoint on major switching. Similar to the second-year results, there are no strong overarching effects on major choice. The only significant estimates are a 5.9 pp increase in the likelihood for students only near the credit benchmark to change majors one year after aid loss and marginally significant increases of 8.0 and 6.5 pp in changing majors by graduation for students in the "Full" and "Credit Discontinuity" specifications, respectively.

While financial aid loss may influence the academic decision-making process for some students, these findings provide no clear evidence that it is a major driver of major switching. The limited effects suggest that by the third year, students may already be firmly committed to their chosen field of study, reducing the likelihood of adjusting their major in response to financial pressures.

6.2.5 Early-Career Earnings

Table A.5 provides some evidence that losing the TEXAS Grant after the third year led to higher early-career earnings, particularly in the first year after enrollment ended. For the "Full" specification, earnings in the first post-enrollment year increase by \$6,979 for all students and \$7,422 for those who graduated. However, as the sample size decreases in later years, estimates for second- and third-year earnings become statistically insignificant, though point estimates remain above \$4,000, suggesting that any potential long-term effects may require a larger sample or longer observation period to be detected.

Among students near just the credit discontinuity, a similar pattern emerges. First-year earnings increase by \$5,011 for all students and \$5,647 for graduates, indicating that students in this group may have entered the labor market at higher-paying jobs to compensate for lost financial aid. While second-year earnings estimates are insignificant, earnings effects grow substantially in the third year, rising to \$10,460 for all students and \$11,489 for graduates ($p<0.01$). This suggests that the financial strain caused by aid loss may have influenced career trajectories in a way that led to higher earnings gains over time.

These results provide evidence that financial aid loss pushed students toward higher-earning jobs, with the effects most pronounced for those only around the credit discontinuity. The underlying mechanism remains unclear — not all students exited or graduated with higher debt burdens, making it unlikely that increased borrowing directly drove these earnings increases. Likewise, because the estimates are positive, decreases in degree attainment are not contributing factors. Instead, these patterns suggest that students adjusted their post-college decisions for other reasons. One possibility is that the longer time to graduation provided students with additional labor market experience while still enrolled, which could translate into higher initial earnings even if that work was only part-time.[16] Given the lack of significance in some later-year estimates, it remains uncertain whether these effects persist long-term or if they diminish as students settle into their

[16] Specifically, labor market experience gained after the fourth year, which is not examined in the current analysis.

post-college careers.

6.3 Discussion

The results from both renewal benchmarks illustrate the significant consequences of losing the TEXAS Grant, though the timing of aid loss plays a crucial role in shaping student responses. While financial aid loss after the second year led some students to accelerate graduation, it also significantly reduced degree attainment for a subset of students. In contrast, students who lost aid after the third year experienced longer time-to-degree but smaller or no significant declines in overall graduation rates, indicating that while financial constraints disrupted their progress, most were still able to complete their degrees, just at a slower pace.

This pattern is largely intuitive: by the time students reach their third year, they have already made substantial progress toward a degree and may be more committed to completing it, even if aid loss forces them to slow down. Many have few remaining requirements, making it easier to persist even with financial strain. However, the fact that aid loss after the second year significantly reduced degree attainment, while third-year aid loss did not, remains striking. Given that second-year students still have time to adjust their academic and financial plans, one might expect them to be able to adapt. However, this is not the case, underscoring the importance of maintaining financial aid support beyond just the first year, as disruptions midway through college appear to be particularly destabilizing for many students.

Further, these findings also suggest that financial aid loss affects students differently based on their academic standing. Students near the credit discontinuity — who had strong GPAs but failed to meet credit accumulation requirements — consistently exhibited the most negative academic and graduation outcomes. Among former recipients who did not graduate, the average credit accumulation at the time of exit was more than 78 credits for those who lost the TEXAS Grant after the second year and 98 credits for those who lost it after the third year — both well beyond the halfway point to a degree. Moreover, average cumulative GPAs were well above the minimum renewal threshold (2.95 and 3.03), indicating that they were academically capable and making progress toward a degree. These students were not failing out of college — rather, they were forced to exit despite having demonstrated the ability to succeed over multiple years of full-time enrollment.

The fact that students still withdrew due to financial constraints underscores the extent to which losing aid at a late stage can serve as a roadblock to degree attainment and challenge the notion that students who leave college without graduating do so primarily due to poor academic performance. Instead, they highlight that many students who drop out after losing aid were on the cusp of completing their degrees but lacked the financial resources to cross the finish line. From a policy perspective, this suggests that interventions aimed at supporting students who have already demonstrated a commitment to their education and performed well academically may be critical in improving overall graduation rates.

Interestingly, the lack of significant effects on graduation for students near only the GPA thresh-

old aligns closely with prior studies examining first-year renewals that use GPA-based requirements (Carruthers and Özek, 2016 & Jones et al., 2021). This similarity suggests that failing to meet GPA renewal thresholds — even beyond the first year — may not be as disruptive to long-term degree attainment as failing to meet credit-based renewal thresholds, though the small number of students in this category for this analysis limits the strength of these findings.

Although earnings estimates provide some evidence that students who lost aid after three years entered higher-paying jobs, the underlying mechanisms remain unclear. The fact that increased earnings are observed both among all students and only among graduates suggests that financial aid loss have influenced early-career earnings beyond the degree premium. Future work could examine whether students adjusted their employment search strategies or opted for industries with faster earnings growth in response to financial strain.

Taken together, these results demonstrate that financial aid loss creates a fundamental risk for students, even after they have made substantial progress toward a degree. While some students can adjust their academic plans to compensate for lost aid, others face limited options and are more likely to leave college without graduating. These findings underscore the need for policymakers to consider not only how aid programs facilitate college access but also how stability in financial aid affects degree completion and long-term student success.

6.4 Robustness Checks

To further assess the validity of these findings, I conduct a robustness check using a single-dimensional difference-in-discontinuities framework. Instead of separately considering GPA and credit completion as running variables, I construct a standardized measure of distance from the renewal thresholds. Specifically, for each student, I standardize the distance from each cutoff and take the minimum of these two values. This approach accounts for the fact that students only need to fall below one threshold to lose eligibility, allowing me to estimate the overall effect of aid loss using a single-dimensional difference-in-discontinuities design. By using this alternative specification, I obtain an additional estimate of the impact of financial aid loss that serves as a robustness check for the "Full" specification in the primary analysis.

Estimation for this specification follows Equation 3, replacing *Credit Lose* and centered credits with their counterpart using this new running variable. In this context, students lose eligibility if the running variable falls below zero — i.e., if their cumulative GPA is below 2.5 or they pass fewer than 24 credits. Optimal bandwidth selection again follows Calonico et al. (2014), yielding bandwidths of 0.905 and 0.929 standard deviations for the second- and third-year benchmarks, respectively. Since this approach results in a different sample and reduces the dimensionality of the running variable, the estimates are not expected to exactly match those from the "Full" specification. Rather, this serves as a robustness check to assess whether an alternative specification and methodology produce similar results.

Table 9 presents estimates of aid loss after the second year on financial aid and academic outcomes using this specification. Panel A shows that the effects on financial aid closely align with

those in Table 3, though the estimated impact on loans is larger. This results in a slightly smaller net reduction in total aid and significantly higher subsequent borrowing. Panel B reveals similar negative effects on full-time enrollment (-7.2 pp in the third year) and fourth-year persistence (-3.2 pp), although the latter is no longer significant. Similarly, estimates on third-year credit accumulation remain negative and significant.

Panel A: Financial Aid			**Panel B: Academic Outcomes**		
Aid Component	**Third Year**	**Fourth Year**	**Outcome**	**Third Year**	**Fourth Year**
Total Aid	-2394***	-1080**	Persistence	—	-0.032
	(422)	(474)			(0.020)
Gift Aid	-6125***	-4169***	Credits Withdrawn	0.012	-0.054
	(269)	(333)		(0.202)	(0.174)
TEXAS Grant	-6180***	-3259***	Full-Time Enrollment	-0.072**	-0.014
	(75)	(165)		(0.032)	(0.034)
Loans	3605***	3035***	Credits Attempted	-1.125**	-0.441
	(320)	(342)		(0.514)	(0.596)
Work-Study	126**	54	Credits Passed	-1.357**	-0.597
	(64)	(62)		(0.593)	(0.665)
Earnings	43	61	GPA	-0.006	-0.046
	(31)	(39)		(0.051)	(0.060)
Loans After Benchmark	—	6805***			
		(849)			
N	109,018	93,847	N	109,018	93,847

Notes: 4th-year financial aid and academic outcome estimates are only provided for students who enroll a fourth year. "Loans After Benchmark" is the cumulative loan amount students take out after their second year. "Credits Withdrawn" is the credit value of total withdraws during the given academic year. "GPA" only considers courses during the given year, not cumulative GPA.
*p<0.10; **p<0.05; ***p<0.01.

Table 9. Financial Aid and Academic Outcomes Robustness Check — Year 2 Benchmark

Table A.6 shows a similar pattern for the third-year benchmark, with slightly larger increases in loans, leading to a smaller net reduction in total aid. The negative effects on academic outcomes remain similar to those in Table 7 and continue to be statistically significant.

Table 10 presents estimates for graduation outcomes across both renewal benchmarks. The second-year renewal estimates follow a similar pattern but are substantially larger in magnitude than those shown in Table 5. Additionally, this specification finds a significant increase in overall degree attainment, along with an acceleration in time to graduation of 9.1 months. The significant increase in degree attainment and overall quicker time to graduation suggests that aid loss prompted a strong response from students, leading them to prioritize timely degree completion and ultimately increasing overall graduation rates.

The significant increase in degree attainment for aid loss after the second-year benchmark contrasts with the insignificant effect found in the main analysis. This difference may reflect

variation in the composition of students included in this specification — for instance, a smaller share of students near the credit discontinuity, who experienced the largest declines in degree attainment. This finding warrants further investigation, and additional forthcoming robustness checks, discussed at the end of this section, may help clarify the underlying mechanisms.

Outcome	**Second-Year Benchmark**	**Third-Year Benchmark**
Graduate in 4 Years	0.444***	-0.107**
	(0.0790)	(0.0460)
N	109,018	106,901
Graduate in 5 Years	0.403***	-0.221***
	(0.0872)	(0.0490)
N	96,844	93,106
Graduate in 6 Years	0.322***	-0.187***
	(0.0873)	(0.0429)
Bachelor's Degree	0.293***	-0.116***
	(0.0775)	(0.0368)
N	82,807	79,796
Time to Graduate (Months)	-9.115***	2.723*
	(2.8289)	(1.3913)
N	88,696	94,744

Notes: Four-year graduation rates include all cohorts; five-year graduation rates omit the fall 2018 entry cohort as spring 2023 graduation records are not yet available; six-year graduation rates and degree attainment further omit the the fall 2017 entry cohort. Time to graduation only includes graduates, using the month and year of their graduation and assumes a uniform starting month of September for all universities.

Table 10. Graduation Outcomes Robustness Check — Year 2 and 3 Benchmarks

The final column of Table 10 presents estimates for the third-year renewal, which again closely align with the main findings. Four-, five-, and six-year graduation rates declined by 10.7, 22.1, and 18.7 pp. Moreover, the effect on degree attainment is now significant at -11.6 pp, with a similar delay in time to degree completion for graduates (2.72 months). This reinforces the notion that while students losing aid after the second year may have adjusted their academic plans to accelerate graduation — and possibly even graduate at higher rates — those losing aid after the third year faced more structural barriers to degree completion, leading to a direct decline in overall attainment.

Tables A.7 and A.8 present results on major changes and early-career earnings, respectively, for both the second- and third-year renewal benchmarks. All estimates closely align with the main results, reinforcing the conclusions discussed earlier.

In addition to the robustness check presented above, future analyses will explore alternative bandwidth selections and further segmentation of the GPA and credit discontinuities. Specifically, I will re-estimate the full, box, and credit/GPA discontinuity specifications using narrower bandwidths around the optimal selection to assess the sensitivity of results to bandwidth choice.

Additionally, I plan to further investigate heterogeneity along academic performance dimensions. While my current findings indicate that students near only the credit discontinuity experience the most negative effects, it remains unclear whether this impact varies across the GPA spectrum. To address this, I will stratify the credit discontinuity sample by GPA — potentially dividing students into those with GPAs between 2.85 and 3.35 and those above 3.35 — to compare how aid loss affects students with differing levels of overall academic performance. A similar approach may be applied to the GPA discontinuity, examining whether effects differ based on total credit accumulation, though the feasibility of this analysis may be constrained by sample size. These refinements will provide a more nuanced understanding of how aid loss interacts with students' academic profiles, yielding deeper insights into differential responses across academic backgrounds.

7 Conclusion

This study examines the consequences of losing financial aid after second- and third-year renewal checkpoints, highlighting how the timing of aid loss shapes student responses. While the existing literature focuses on first-year financial aid renewal, these results demonstrate that aid loss later in college presents distinct challenges, with implications for persistence, academic performance, and graduation.

Losing the TEXAS Grant after the second year led to a mix of responses: some students hastened their graduation, while others were unable to adjust their academic plans and ultimately left college without earning a degree. In contrast, students who lost aid after the third year faced longer time-to-degree but did not experience large declines in overall graduation rates. The contrast between these two benchmarks suggests that early financial instability is more damaging to overall degree attainment, while later-stage aid loss primarily affects the timing of graduation and students' ability to maintain full-time enrollment. However, those who did drop out after losing aid at these checkpoints had already made substantial academic progress, often accumulating the majority of required credits and maintaining strong GPAs, underscoring the role of financial constraints rather than academic struggles in explaining their departure from college.

This study contributes to the financial aid literature by moving beyond first-year benchmarks to examine how mid-college aid loss affects student trajectories. While previous research has emphasized the importance of initial access to financial aid, these results show that aid stability in later years is equally critical for ensuring degree completion. The findings also provide new insights into how students respond to financial shocks depending on where they are in their academic careers. Unlike first-year aid loss, which often leads to immediate dropout decisions, later-stage aid loss presents students with fewer options — some attempt to persist at a reduced pace, while others accumulate debt, and a subset ultimately exits despite being close to graduation.

Additionally, this study provides a more nuanced look at heterogeneity in student responses by distinguishing between those who failed to meet GPA vs. credit requirements. The fact that students near only the credit threshold suffered severe setbacks in persistence and graduation

suggests that financial aid renewal policies may not account for differences in academic progress.

These findings have important implications for financial aid policy design, particularly at a time when college affordability remains a central concern. Rising tuition costs have been partially offset by increased grant aid, yet many programs continue to impose rigid renewal criteria that may not align with their goal of helping students complete their degrees. Given that aid loss disproportionately affects students who have already made substantial academic progress, current renewal structures may unintentionally undermine degree completion rather than support it.

One potential policy reform for programs that do not allow students to re-qualify for aid is the introduction of probationary periods for students who fall just short of renewal criteria, particularly for credit completion requirements. Rather than immediately revoking aid, students could be given a semester to meet the requirement before losing full eligibility. This would prevent situations where otherwise strong students fall behind due to temporary setbacks and lose the financial support necessary to recover.

Another alternative is partial aid reductions instead of full grant revocation. The current structure treats a student failing to pass one additional course the same as a student who has fallen out of academic good standing, yet the results of this study suggest that students respond very differently depending on their academic standing. A tiered renewal approach — where students who narrowly miss the requirements receive partial funding rather than a complete loss of aid — could mitigate the destabilizing effects of financial aid loss while still maintaining accountability.

Additionally, policymakers could consider modifying the credit completion requirement to focus on credits attempted rather than a fixed threshold of passed credits. Currently, the TEXAS Grant mandates that students pass 24 credits annually to remain eligible, regardless of how many they attempt. This structure penalizes some students, particularly those who enroll in a full-time course load but fall slightly short due to course failures, withdrawals, or other setbacks. An alternative approach would be to align the credit completion requirement with the federal financial aid standard, which requires students to pass at least two-thirds of their attempted credits. This change would ensure that students who remain actively enrolled and engaged in coursework are not automatically disqualified from aid due to setbacks in an individual course. Given that results indicate that students failing to meet the credit threshold suffered the most severe academic and financial consequences, shifting to an attempted-credit-based metric could provide greater flexibility while still encouraging steady academic progress.

While this study focuses on aid loss due to renewal benchmarks, future research should examine the impact of losing aid for reasons beyond academic performance. Many students lose financial aid due to factors unrelated to their academic standing, such as small increases in family income that push them above eligibility thresholds for need-based grants or simply failing to reapply due to administrative complexity. The ongoing difficulties surrounding FAFSA processing delays and recent federal funding pauses underscore the precarious nature of financial aid systems. Understanding how these disruptions affect student outcomes will be crucial for informing policies aimed at improving aid accessibility and stability.

As financial aid programs continue to evolve, policymakers should focus not only on expanding access to aid but also on ensuring that the structure of aid programs facilitates persistence and degree completion. The evidence presented in this study underscores that aid loss can disrupt even academically successful students, preventing them from completing degrees they are otherwise well-positioned to earn. Future research should explore additional mechanisms behind student responses to aid loss, particularly in relation to employment decisions, debt accumulation, and long-term labor market outcomes.

While these findings highlight the unintended consequences of renewal criteria, they should not be interpreted as an argument for eliminating financial aid renewal requirements altogether. Maintaining academic progress standards is essential to ensure that aid supports students who remain actively engaged in their coursework. Moreover, the results in this paper do not suggest that strict renewal policies universally harm all students — some adjust their academic plans, take out additional loans, or even accelerate their coursework to graduate on time. However, the current structure of many renewal policies fails to account for the realities of student progress and financial need. Instead of fostering persistence and degree completion, these policies can inadvertently push students out of college, even when they are on track to graduate. A more balanced approach would maintain clear academic expectations while providing students with greater flexibility to recover from setbacks and continue working toward degree completion.

The goal of financial aid programs is to support students through college completion, yet the current design of many programs fails to align with this mission. Aid loss at later stages of college creates unnecessary barriers to graduation, particularly for students who have already demonstrated the ability to succeed. By reforming renewal policies to account for different student circumstances and academic progress, policymakers can help ensure that financial aid fulfills its intended purpose: not just getting students into college, but helping them cross the finish line.

8 Appendix

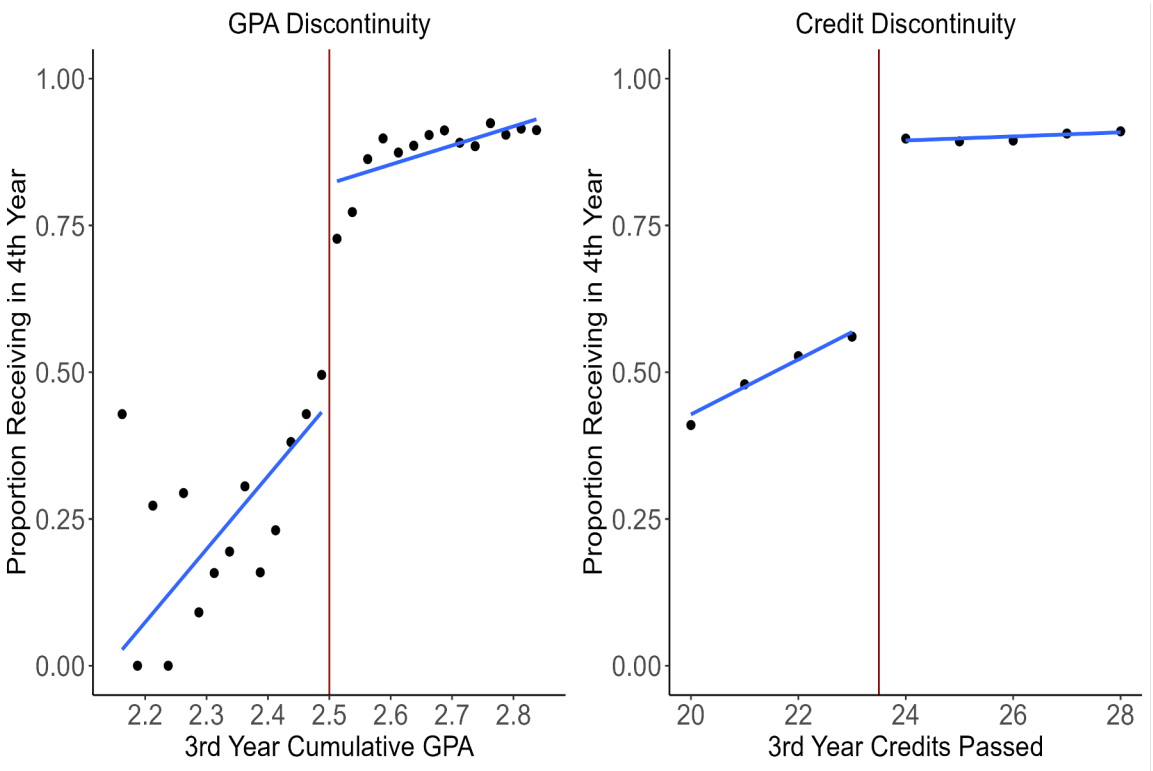


Figure A.1. First Stage — Year 3 Benchmark

Panel A: Student Demographics		Panel B: Family Income		Panel C: 2nd-Year Academic Outcomes		Panel D: Institution	
Outcome	**Estimate**	**Outcome**	**Estimate**	**Outcome**	**Estimate**	**Outcome**	**Estimate**
Age	-0.007	Unknown	0.010	STEM Major	0.016	UT-Austin	-0.003
	(0.0130)		(0.0144)		(0.0139)		(0.0109)
Male	-0.022	<$20,000	0.009	Cumulative GPA	0.020***	Texas A&M —	0.010
	(0.0150)		(0.0070)		(0.0043)	College Station	(0.0112)
White	0.027*	$20,000-$39,999	-0.001	Credits Attempted	0.253*	UT-Dallas	-0.009
	(0.0145)		(0.0087)		(0.1141)		(0.0062)
Black	0.010	$40,000-$59,999	-0.005	Credits Passed	0.371***	Texas Southern	0.001
	(0.0084)		(0.0087)		(0.1194)		(0.0027)
Hispanic/Latino	-0.022*	$60,000-$79,999	-0.011	Math Credits Attempted	0.154*	UT-Brownsville	-0.003*
	(0.0134)		(0.0080)		(0.0912)		(0.0015)
First-Generation	-0.019*	$80,000+	-0.003	Science Credits Attempted	0.244	Sul Ross State	0.001
	(0.0100)		(0.0135)		(0.1814)		(0.0012)
N	195,335	**N**	195,335	**N**	195,335	**N**	195,335

Notes: The family income bins in Panel B correspond to the options students can select on their applications. STEM majors include fields related to engineering, biology, mathematics/statistics, and physical sciences. Mathematics and science courses are classified based on subject codes, with mathematics/statistics representing math courses and biology, chemistry, physics, physical sciences, geology, and general science representing science courses. UT-Austin, Texas A&M - College Station, and UT-Dallas have the three highest graduation rates among the schools in this analysis, while Texas Southern, UT-Brownsville, and Sul Ross State have the lowest.
*p<0.10; **p<0.05; ***p<0.01.

Table A.1. Covariate Balance Check — Year 3 Benchmark

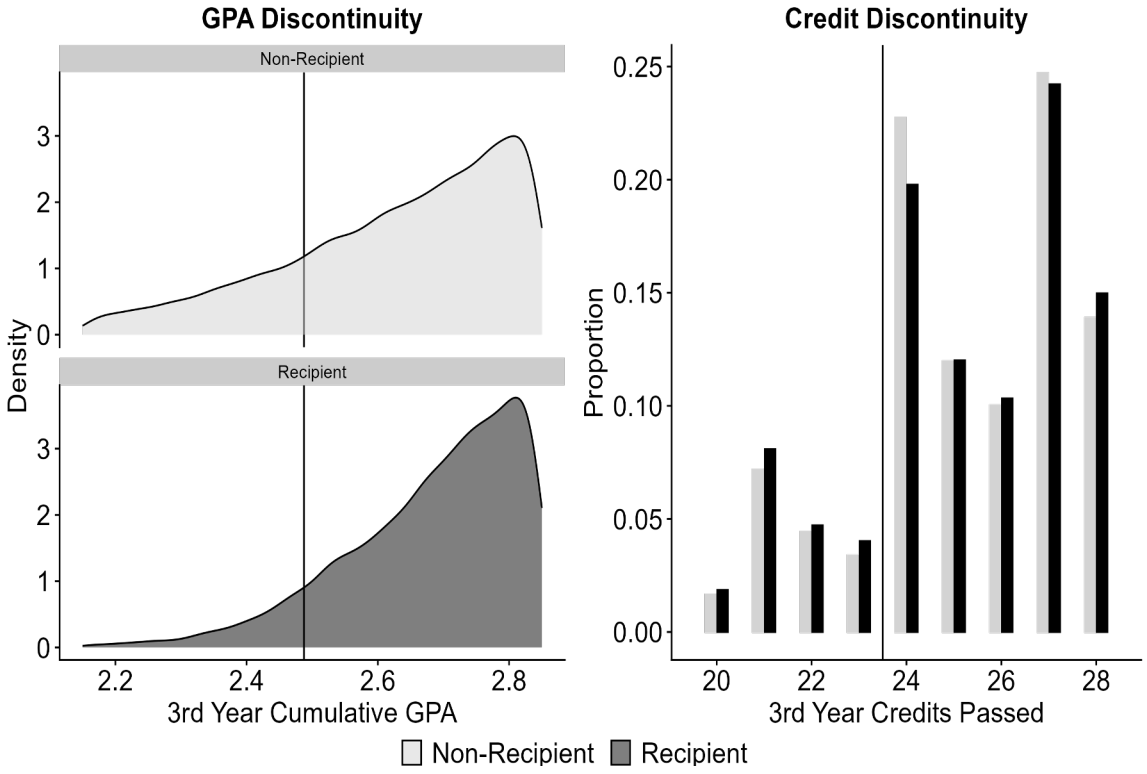


Figure A.2. Density Plots — Year 3 Benchmark

	After 1 Year			After 2 Years			To Graduation		
Specification	**Major Change**	**To STEM**	**From STEM**	**Major Change**	**To STEM**	**From STEM**	**Major Change**	**To STEM**	**From STEM**
Full	0.006	-0.022	-0.011	0.011	-0.035**	0.015	0.014	-0.027	0.026
	(0.028)	(0.027)	(0.036)	(0.030)	(0.017)	(0.029)	(0.035)	(0.023)	(0.035)
N	189,466	53,836	53,836	163,179	76,474	76,474	161,221	56,403	56,403
Box	0.013	-0.038	-0.009	-0.007	-0.028	0.003	-0.012	-0.019	-0.001
	(0.044)	(0.043)	(0.055)	(0.046)	(0.028)	(0.045)	(0.055)	(0.039)	(0.054)
N	43,954	14,923	14,923	38,670	19,704	19,704	33,018	14,696	14,696
Credit Discontinuity	-0.020	0.032	0.070	-0.016	0.019	0.126**	-0.019	-0.047	0.141*
	(0.052)	(0.057)	(0.066)	(0.053)	(0.035)	(0.058)	(0.069)	(0.056)	(0.074)
N	126,681	33,286	33,286	109,436	49,615	49,615	112,045	35,593	35,593
GPA Discontinuity	0.029	-0.007	-0.032	-0.040	-0.046	0.009	0.036	-0.086*	0.016
	(0.070)	(0.065)	(0.103)	(0.077)	(0.037)	(0.074)	(0.081)	(0.052)	(0.090)
N	18,831	5,627	5,627	15,073	7,155	7,155	16,158	6,114	6,114

Notes: "Major Change" is an indicator variable equal to 1 if a student's major at the end of the third year, fourth year, or at graduation differs from their major at the end of their second year, which was the last recorded major before the renewal checkpoint. To "STEM" and "From STEM" are conditional on a student changing majors. "To STEM" indicates that a student's major at the end of the second year was not in STEM, but their major at the end of the third year, fourth year, or at graduation was in STEM. "From STEM" is defined analogously.
*p<0.10; **p<0.05; ***p<0.01.

Table A.2. Effects of TEXAS Grant Loss on Major Changes — Year 2 Benchmark

	All			Graduates		
Specification	**1 Year**	**2 Years**	**3 Years**	**1 Year**	**2 Years**	**3 Years**
Full	371	1394	-1097	-102	750	-834
	(1500)	(1970)	(2375)	(1725)	(2247)	(2752)
N	120,197	97,576	79,174	108,920	88,645	71,859
Box	50	40	-3792	-727	-1919	-3748
	(2199)	(3072)	(3599)	(2606)	(3622)	(4284)
N	29,715	24,541	20,457	24,379	20,375	16,990
Credit Discontinuity	-5497*	-5111	-4409	-4863	-5362	-4789
	(3281)	(3889)	(4811)	(4074)	(4790)	(5910)
N	77,377	62,084	49,579	72,597	58,220	46,473
GPA Discontinuity	-1858	4115	-1939	-467	7299	-807
	(3659)	(4628)	(5843)	(3848)	(4826)	(6159)
N	13,105	10,951	9,138	11,944	10,050	8,396

Notes: Earnings are for the first full year after a student is no longer enrolled. Individuals with no earnings reported to the TWC or are still enrolled are omitted from this analysis. I cannot determine whether individuals with no reported earnings are unemployed, have non-reported earnings, or are no longer in Texas. "All" includes all students who meet this requirement, while "Graduates" restricts to those who earned a bachelor's degree.
*p<0.10; **p<0.05; ***p<0.01.

Table A.3. Effects of TEXAS Grant Loss on Early-Career Earnings — Year 2 Benchmark

	After 1 Year			To Graduation		
Specification	**Major Change**	**To STEM**	**From STEM**	**Major Change**	**To STEM**	**From STEM**
Full	0.034	0.017	0.053	0.080*	0.010	0.015
	(0.034)	(0.027)	(0.048)	(0.047)	(0.031)	(0.038)
N	195,335	59,423	59,423	195,335	59,423	59,423
Box	0.035	-0.050	0.071	0.146**	0.020	-0.012
	(0.050)	(0.033)	(0.076)	(0.073)	(0.040)	(0.068)
N	28,576	8,095	8,095	29,412	8,095	8,095
Credit Discontinuity	0.059**	-0.016	0.043	0.065*	-0.007	-0.010
	(0.024)	(0.016)	(0.032)	(0.033)	(0.019)	(0.020)
N	161,256	49,711	49,711	161,256	49,711	49,711
GPA Discontinuity	-0.287	0.383	-0.249	0.439	0.116	-0.277
	(0.312)	(0.348)	(0.342)	(0.406)	(0.258)	(0.254)
N	5,503	1,560	1,560	5,492	1,560	1,560

Notes: "Major Change" is an indicator variable equal to 1 if a student's major at the end of the fourth year or at graduation differs from their major at the end of their third year, which was the last recorded major before the renewal checkpoint. To "STEM" and "From STEM" are conditional on a student changing majors. "To STEM" indicates that a student's major at the end of the third year was not in STEM, but their major at the end of the fourth year or at graduation was in STEM. "From STEM" is defined analogously.
*p<0.10; **p<0.05; ***p<0.01.

Table A.4. Effects of TEXAS Grant Loss on Major Changes — Year 3 Benchmark

	All			Graduates		
Specification	**1 Year**	**2 Years**	**3 Years**	**1 Year**	**2 Years**	**3 Years**
Full	6979***	4421	5564	7422***	4162	5975
	(2570)	(3042)	(4891)	(2744)	(3229)	(5247)
N	117,623	93,868	73,868	112,857	90,381	71,090
Box	2016	5511	-5229	3534	6949	-2734
	(3057)	(3999)	(5202)	(3419)	(4473)	(5553)
N	19,148	15,809	12,798	16,841	14,049	11,370
Credit Discontinuity	5011**	2204	10460***	5647**	3436	11489***
	(2118)	(2475)	(3770)	(2219)	(2563)	(3987)
N	94,837	74,914	58,385	92,496	73,283	57,113
GPA Discontinuity	-435	-18896	45682	-585	-32043	41406
	(18824)	(25592)	(59159)	(18122)	(29146)	(52075)
N	3,624	3,049	2,561	3,502	3,075	2,489

Notes: Earnings are for the first full year after a student is no longer enrolled. Individuals with no earnings reported to the TWC or are still enrolled are omitted from this analysis. I cannot determine whether individuals with no reported earnings are unemployed, have non-reported earnings, or are no longer in Texas. "All" includes all students who meet this requirement, while "Graduates" restricts to those who earned a bachelor's degree.
*p<0.10; **p<0.05; ***p<0.01.

Table A.5. Effects of TEXAS Grant Loss on Early-Career Earnings — Year 3 Benchmark

Panel A: Financial Aid		Panel B: Academic Outcomes	
Aid Component	**Estimate**	**Outcome**	**Estimate**
Total Aid	-1848***		
	(745)		
Gift Aid	-5581***	Credits Withdrawn	0.563*
	(510)		(0.304)
TEXAS Grant	-5817***	Full-Time Enrollment	-0.146***
	(143)		(0.055)
Loans	3679***	Credits Attempted	-2.131**
	(534)		(0.858)
Work-Study	55	Credit Passed	-2.687***
	(105)		(0.928)
Earnings	-8	GPA	-0.182**
	(65)		(0.083)
Loans After Renewal	5491***		
	(1584)		
N	106,901	N	106,901

"Loans After Benchmark" is the cumulative loan amount students take out after their third year. "Credits Withdrawn" is the credit value of total withdraws during the given academic year. "GPA" only considers courses during the given year, not cumulative GPA.
*p<0.10; **p<0.05; ***p<0.01.

Table A.6. Financial Aid and Academic Outcomes Robustness Check — Year 3 Benchmark

	After 1 Year			After 2 Years			To Graduation		
	Major Change	To STEM	From STEM	Major Change	To STEM	From STEM	Major Change	To STEM	From STEM
Panel A: Second-Year Benchmark									
Estimate	0.012	-0.038	0.020	0.012	-0.045**	0.029	0.042	-0.041	0.065
	(0.034)	(0.030)	(0.043)	(0.036)	(0.020)	(0.034)	(0.041)	(0.027)	(0.040)
N	109,018	33,085	33,085	93,847	45,160	45,160	90,569	34,429	34,429
Panel B: Third-Year Benchmark									
	-0.025	0.047	0.062	—	—	—	0.063	0.017	0.037
	(0.045)	(0.045)	(0.083)	—	—	—	(0.065)	(0.043)	(0.058)
N	106,901	31,947	31,947	—	—	—	106,256	31,947	31,947

Notes: "Major Change" is an indicator variable equal to 1 if a student's major at the end of the third year, fourth year, or at graduation differs from their major at the end of their second year, which was the last recorded major before the renewal checkpoint. To "STEM" and "From STEM" are conditional on a student changing majors. "To STEM" indicates that a student's major at the end of the second year was not in STEM, but their major at the end of the third year, fourth year, or at graduation was in STEM. "From STEM" is defined analogously. All variables are defined analogously for the third-year benchmark analysis. *p<0.10; **p<0.05; ***p<0.01.

Table A.7. Major Changes Robustness Check — Year 2 and 3 Benchmarks

	All			Graduates		
	1 Year	**2 Years**	**3 Years**	**1 Year**	**2 Years**	**3 Years**
Panel A: Second-Year Benchmark						
Estimate	1840	2462	-44	668	2115	358
	(1762)	(2299)	(2848)	(2001)	(2586)	(3257)
N	70,945	58,097	47,493	63,240	51,987	42,457
Panel B: Third-Year Benchmark						
Reduced	10685***	6689*	8690	11888***	6457	10935*
	(3460)	(3991)	(6104)	(3700)	(4269)	(6625)
N	65,385	52,665	41,661	62,345	50,419	39,868

Notes: Earnings are for the first full year after a student is no longer enrolled. Individuals with no earnings reported to the TWC or are still enrolled are omitted from this analysis. I cannot determine whether individuals with no reported earnings are unemployed, have non-reported earnings, or are no longer in Texas. "All" includes all students who meet this requirement, while "Graduates" restricts to those who earned a bachelor's degree.
*p<0.10; **p<0.05; ***p<0.01.

Table A.8. Early-Career Earnings Robustness Check — Year 2 and 3 Benchmarks

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