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

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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 using the GPA and credit 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 substantial 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. At both renewal points, aid loss decreases full-time enrollment, credit accumulation, and persistence. However, while aid loss after the second year does not significantly reduce timely graduation or overall degree attainment, third-year aid loss delays graduation. These average effects mask important heterogeneity: students who fail to meet the credit renewal threshold, but otherwise perform well academically, experience the most severe consequences, including large declines in both timely graduation and overall degree completion. Impacts are also larger among students attending institutions without tuition caps, highlighting how institutional tuition structures interact with aid loss. Further, aid loss increases the likelihood of switching out of STEM majors and reduces the likelihood of switching into them, although impacts on early-career earnings are less clear. A simple back-of-the-envelope calculation suggests that a one-time course failure waiver could have prevented aid loss for thousands of students and led to approximately 340 additional degrees. These findings underscore the critical role of continued financial aid in supporting college completion and suggest that renewal policies should account for students' academic standing, institutional context, and capacity for recovery when designing eligibility criteria.

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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 declines in academic performance, including reductions in enrollment intensity and credits completed, but has no measurable impact on timely graduation or overall degree completion. Aid loss after the third year similarly reduces enrollment intensity and academic progress, but now leads to substantial delays in timely graduation, although overall degree attainment remains unaffected. However, these average patterns mask important heterogeneity: students who lose aid solely due to failing the credit accumulation benchmark experience much more severe setbacks, with large declines in both timely graduation and overall degree completion following aid loss at either renewal checkpoint. In addition to these academic impacts, aid loss also increases the likelihood of switching out of STEM majors and reduces the likelihood of switching into STEM fields, although effects on early-career earnings are smaller and less clear.

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. After the third year, aid loss has a more limited negative impact on academic outcomes; however, in contrast to earlier aid loss, its primary effect is to delay graduation, without significantly reducing 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, with large declines in both five- and six-year graduation rates and overall degree attainment at each renewal benchmark. 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 TEXAS Grant operates as a last-dollar scholarship designed to cover any remaining tuition and required fee costs for eligible students attending public institutions in Texas. Institutions must first apply non-loan federal, state, or institutional aid toward tuition and fees before using TEXAS Grant funds. However, the award does not cover living expenses such as room, board, or transportation, and many recipients still rely on loans and other financial aid to finance the full cost of attendance. 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, including students enrolled 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 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. To the best of my knowledge, these renewal criteria are specific to the TEXAS Grant program and do not align with the eligibility rules of any other state or federal aid sources. 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. Among students who fail to renew and are below a threshold, 43% fall short on both GPA and credit requirements, 35% fall below only the credit threshold, and 22% fall below only the GPA requirement, showing that both thresholds contribute meaningfully to aid loss.[4]

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,

[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.

[4]Some students lose aid despite meeting both criteria. I exclude these cases from this breakdown, as the reason for loss is not observable in the data.

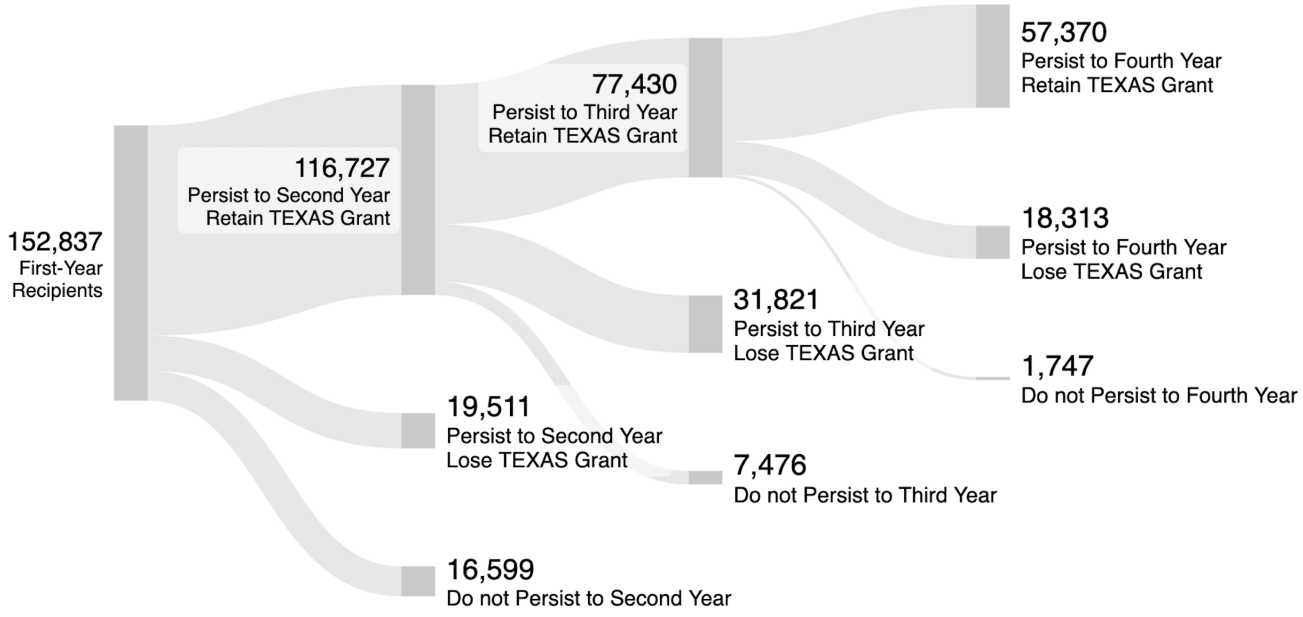

Figure 1. Flow of TEXAS Grant Recipients

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 Schol-

arship — 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 re-

ductions 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).[5]

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 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. Additional sample restrictions, described in the methodology section, further refine the analysis.

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

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.[6] 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.[7] Unfortunately, data on appeal 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.

Since the renewal requirements do not perfectly predict continued receipt of the TEXAS Grant,

[6] 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.

[7] 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.

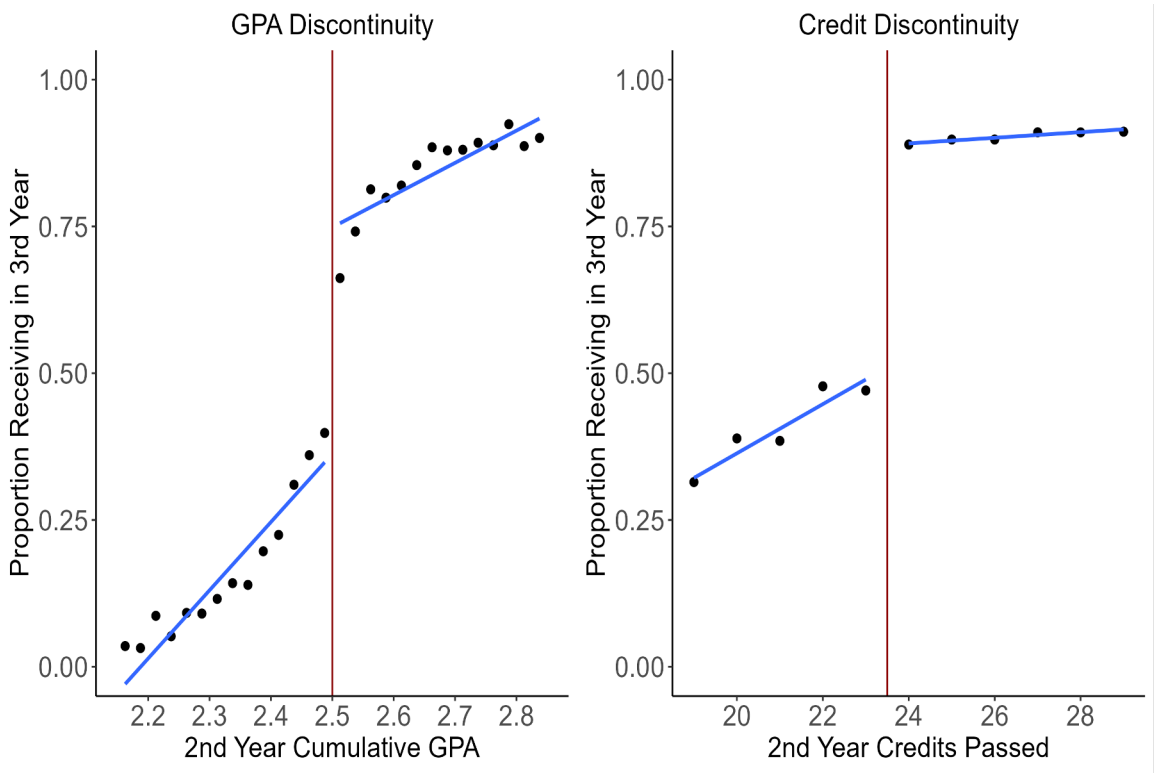

Figure 2. First Stage — Year 2 Benchmark

my main approach is a fuzzy multidimensional difference-in-discontinuities. I extend the framework of Choi and Lee (2018) and Jones et al. (2021) to accommodate the fuzziness in treatment assignment and the inclusion of non-recipients. Formally, the first-stage of my estimation approach uses the following equation:

$$(Lose_{i,t+1} \times Recipient_{it}) = \pi_0 + \pi_1(1\{GPA_{it} < 2.5 \text{ or } Credits_{it} < 24\} \times \text{Recipient}_{it}) + \gamma\text{Recipient}_{it} + f(GPA_{it}, Credits_{it}) + [Recipient_{it} \times f(GPA_{it}, Credits_{it})] + X_{it} + W_{i,t-1} + Major_{i,t=1} + Institution_i + Cohort_i \quad (1)$$

where $(Lose_{i,t+1} \times Recipient_{it})$ is the endogenous treatment variable that captures the effect of losing the TEXAS Grant among prior recipients. The variable $Lose_{i,t+1}$ is an indicator equal to 1 if a student either loses the TEXAS Grant (for recipients) or falls below either renewal threshold (for non-recipients, who by definition have no TEXAS Grant to lose).[8] The instrument is the interaction $1\{GPA_{it} < 2.5 \text{ or } Credits_{it} < 24\} \times Recipient_{it}$, which captures exogenous variation in grant loss induced by the GPA and credit thresholds, but only among recipients. Xi is a vector of student demographic characteristics including gender, age, race/ethnicity, and family income, while $W_{i,t-1}$

[8]This structure creates a sharp discontinuity for non-recipients and a fuzzy discontinuity for recipients. The validity of this approach rests on the assumption that compliance among recipients is not systematically correlated with unobserved determinants of outcomes and that crossing the threshold for non-recipients affects outcomes only through academic disruptions.

is a vector of pre-renewal academic outcomes that includes cumulative GPA, credits attempted and passed, and the number of math, science, social science, and English credits completed through the year preceding the renewal checkpoint. Fixed effects for 2-digit CIP entry major, institution, and cohort are also included.

The function $f()$ 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 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 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.

First-stage estimates show that falling below either renewal threshold reduces the probability of continued grant receipt by 51 to 56 percentage points (pp) depending on the bandwidth, confirming the strength of the instrument. My second-stage equation is then specified as follows:

$$\begin{aligned} Y_{i\tau} = \alpha + \beta(\widehat{\text{Lose}_{it+1} \times \text{Recipient}_{it}}) + \gamma_1 Lose_{i,t+1} + \gamma_2 Recipient_{it} + \\ f(GPA_{it}, Credits_{it}) + [Recipient_{it} \times f(GPA_{it}, Credits_{it})] + \\ \lambda X_i + \omega W_{i,t-1} + Major_{i,t=1} + Institution_i + Cohort_i + \epsilon_{it} \end{aligned} \tag{3}$$

where $Y_{i\tau}$ is an outcome relating to subsequent financial aid, academic outcomes, graduation, major changes, or earnings, with $\tau \geq t+1$, and all other variables are as previously defined. 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.[9]

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

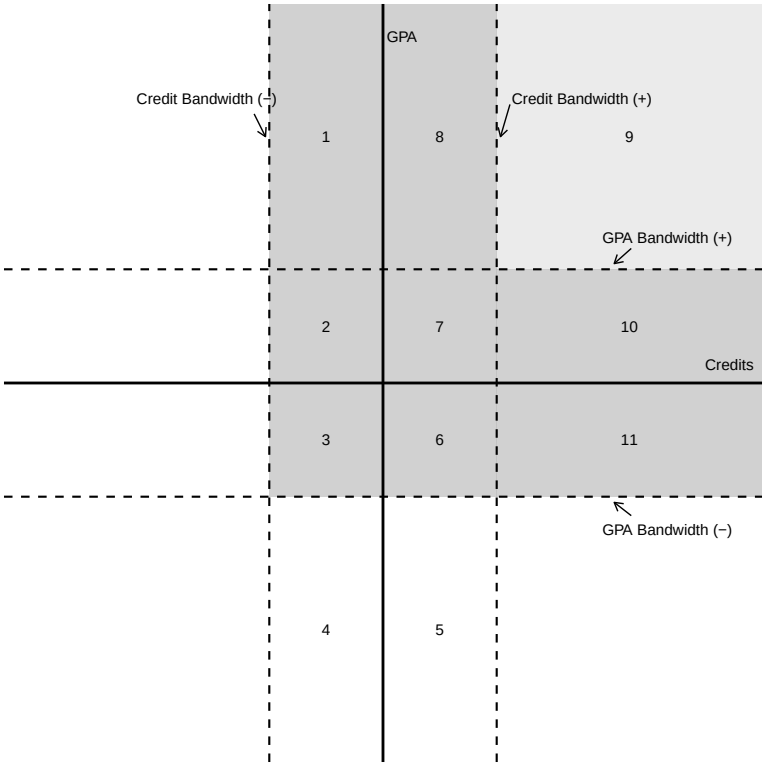

Figure 3. Bandwidths and Specification Illustration

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*

Following Jones et al. (2021), I select bandwidths for each dimension separately, conditional on being above the other renewal threshold, using the bias-corrected optimal bandwidth procedure from Calonico et al. (2014). The resulting bandwidths are 5 credits and 0.328 GPA points for the second-year benchmark and 5 credits and 0.333 GPA points for the third-year benchmark.[10] 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.

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 41,926 of the 109,251 (38.4%) initial TEXAS Grant recipients who remain enrolled

[10]Optimal bandwidths are nearly identical if I do not condition on being above the other renewal threshold. For the second-year benchmark, the bandwidths are 5 credits and 0.349 GPA points; for the third-year, they are 5 credits and 0.348 GPA points.

for at least three years.

Variable	All Recipients (1)	Recipients in Analysis (2)	Non-Recipients in Analysis (3)
Age	18.08	18.03	18.06
Male	0.42	0.40	0.45
White	0.18	0.18	0.54
Black	0.17	0.16	0.08
Hispanic/Latino	0.55	0.55	0.26
Year 1 Credits Passed	24.44	28.07	28.36
Year 1 Cumulative GPA	2.71	3.07	3.18
Graduate	0.66	0.88	0.92
Students	152,837	41,926	140,219

Notes: This table reports descriptive statistics for three groups. Column (1) includes all students who ever received the TEXAS Grant. Column (2) restricts to second-year TEXAS Grant recipients who fall within the optimal bandwidth of at least one second-year renewal threshold. Column (3) includes non-recipients within the same optimal bandwidth.

Table 1. Descriptive Statistics of Recipients and Non-Recipients

The first two columns of Table 1 compare all initial TEXAS Grant recipients to those included 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 (28.07 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 (54% vs. 18%), while a smaller share are Hispanic/Latino (26% 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 (3.18 vs. 3.07) and graduate at somewhat higher rates (92% 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.

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 still 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 eligibility. These students differ substantially in their academic performance, and it is unlikely that the loss of aid would affect them in the same way. Students with stronger academic records may be more likely to persist and have greater access to alternative funding, but may also perceive their aid as more secure — making the loss more unexpected and potentially more disruptive.

To explore whether effects differ across academic profiles, I segment the full analysis into three mutually exclusive groups, based on which threshold(s) students are near. Each student falls into one of the following categories:

1. **Box.** Students who are close to both the GPA and credit thresholds (regions 2, 3, 6, and 7 in Figure 3). This group includes 21.7% of students in the second-year benchmark and 15.0% in the third-year benchmark. I retain the full model shown in Equation 3 but restrict the sample to those within the optimal bandwidth for both thresholds.

2. **Credit Discontinuity.** Students who exceed the GPA threshold but fall near the credit threshold only (regions 1 and 8 in Figure 3). This group includes students who passed between 19 and 29 credits and maintained GPAs above 2.828 (2.5 ± the optimal bandwidth of 0.328), accounting for 69.1% of the second-year sample and 75.5% of the third-year sample. Because all students meet the GPA requirement, the model simplifies to the single-dimensional diff.-in-disc. shown below using credits passed as the running variable:

$$\begin{aligned} Y_{i\tau} = \alpha + \beta(\widehat{Lose_{i,t+1} \times Recipient_{it}}) + \phi_1 Lose_{i,t+1} + \phi_2 Recipient_{it} + \\ \phi_3 \tilde{R}_{it} + \phi_4(\tilde{R}_{it} \times Lose_{i,t+1}) + \phi_5(\tilde{R}_{it} \times Recipient_{it}) + \\ \phi_6(\tilde{R}_{it} \times Lose_{i,t+1} \times Recipient_{it}) \; + Controls + FE \end{aligned} \tag{4}$$

   where $\tilde{R}_{it}$ denotes centered credits passed. The endogenous treatment indicator, $(Lose_{i,t+1} \times Recipient_{it})$, is instrumented using the interaction $(1\{Credits_{it} < 24\} \times \text{Recipient}_{it})$. The coefficient of interest, β, captures the LATE of losing the TEXAS Grant due to insufficient credit accumulation.

3. **GPA Discontinuity.** Students who exceed the credit threshold but fall near the GPA threshold only (regions 10 and 11 in Figure 3). This group passed more than 29 credits (24 ± the optimal bandwidth of 5) and had cumulative GPAs between 2.172 and 2.828. It represents 9.1% of the second-year benchmark and 9.5% of the third-year benchmark. The estimating equation is defined analogously to the Credit Discontinuity specification, but uses centered

GPA as the running variable and instruments the treatment interaction with an indicator for falling below the 2.5 GPA threshold interacted with recipient status.

Table 2 presents descriptive statistics for each subgroup, showing meaningful differences in both demographics and academic performance — particularly in cumulative GPA and credits passed through two years — highlighting the importance of estimating effects separately by academic profile. Mechanically, students in the Credit Discontinuity group maintain GPAs 0.79 points higher but have completed nearly 7 fewer credits than those in the GPA Discontinuity group. Students in the Box group are worse off on both dimensions, with lower GPAs (2.57) and fewer completed credits (53) than either group. These differences underscore that students lose eligibility for distinct reasons, which may shape their capacity to recover from it.

Variable	**Full**	**Box**	**Credit**	**GPA**
Male	0.439	0.489	0.422	0.450
White	0.454	0.386	0.482	0.411
Black	0.100	0.154	0.073	0.174
Hispanic	0.326	0.374	0.311	0.324
Other	0.120	0.086	0.134	0.091
First-Generation	0.145	0.173	0.135	0.150
Credits Passed	55.01	52.99	54.81	61.29
Cumulative GPA	3.15	2.57	3.40	2.61
N	182,137	39,592	125,886	16,659
Credits Passed Range	$\geq$19	[19,29]	[19,29]	>29
GPA Range	$\geq$ 2.172	[2.172,2.828]	>2.828	[2.172,2.828]

Notes: This table reports descriptive statistics for students in the second-year benchmark sample. "Full" includes all students within the optimal bandwidth around either threshold. "Box" includes students near both the GPA and credit thresholds. "Credit" includes students who meet the GPA threshold but are near the credit threshold only. "GPA" includes students who meet the credit threshold but are near the GPA threshold only. Cumulative GPA and credits passed are measured at the end of the second year, when TEXAS Grant renewal is assessed.

Table 2. Descriptive Statistics by Sample

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:

$$X_{it} = \alpha + \beta(Ineligible_{it} \times Recipient_{it}) + \eta_1 Ineligible_{i,t} + \eta_2 Recipient_{it} + f(GPA_{it}, Credits_{it}) + [Recipient \times f(GPA_{it}, Credits_{it})] \quad (5)$$

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 **??**), 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 3 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 (3.0 pp) than among non-recipients, with a corresponding 3.7 pp decrease in the proportion of Hispanic/Latino students. Similarly, the proportion of first-generation students declines by 3.7 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 1.6 pp increase in the proportion of recipients from families earning below $20,000.[11] While these differences are small in magnitude, they could still have important implications for interpreting later results.

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	-0.002	Unknown	-0.012	STEM Major	0.020	UT-Austin	0.002
	(0.0141)		(0.0152)		(0.0139)		(0.0111)
Male	-0.007	<$20,000	0.016***	Cumulative GPA	0.001	Texas A&M	0.030***
	(0.0159)		(0.0077)		(0.0080)	College Station	(0.0114)
White	0.030**	$20k–$39,999	-0.015	Credits Attempted	0.016	UT-Dallas	0.000
	(0.0152)		(0.0094)		(0.1040)		(0.0056)
Black	0.010	$40k–$59,999	0.008	Credits Passed	0.041	Texas Southern	-0.005
	(0.0094)		(0.0093)		(0.1027)		(0.0030)
Hispanic/Latino	-0.037**	$60k–$79,999	0.003	Math Credits Attempted	0.089	UT-Brownsville	0.000
	(0.0145)		(0.0086)		(0.0964)		(0.0016)
First-Generation	-0.037***	$80,000+	0.000	Science Credits Attempted	0.198	Sul Ross State	0.000
	(0.0110)		(0.0140)		(0.1526)		(0.0014)
N	182,137	**N**	182,137	**N**	182,137	**N**	182,137

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, biological sciences, 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 3. Covariate Balance Check — Year 2 Benchmark

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

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 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.[12]

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 (3.0 pp) of recipients falling below the threshold, this difference is small in magnitude and is unlikely to drive effects. As outline in Equation 3, I control for all characteristics shown in Table 3, either directly or through fixed effects, further mitigating concerns that the estimated effects are driven by changes in student composition across the thresholds.

Table A.1 shows that patterns in student demographics, family income, and institution attended for the third-year benchmark are similar to those in the second-year benchmark. However, there are notable differences in academic outcomes through two years between recipients and non-recipients across the threshold. Specifically, recipients below either renewal threshold have slightly higher GPAs (0.066 points) and pass 0.59 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.

[12] 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).

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.

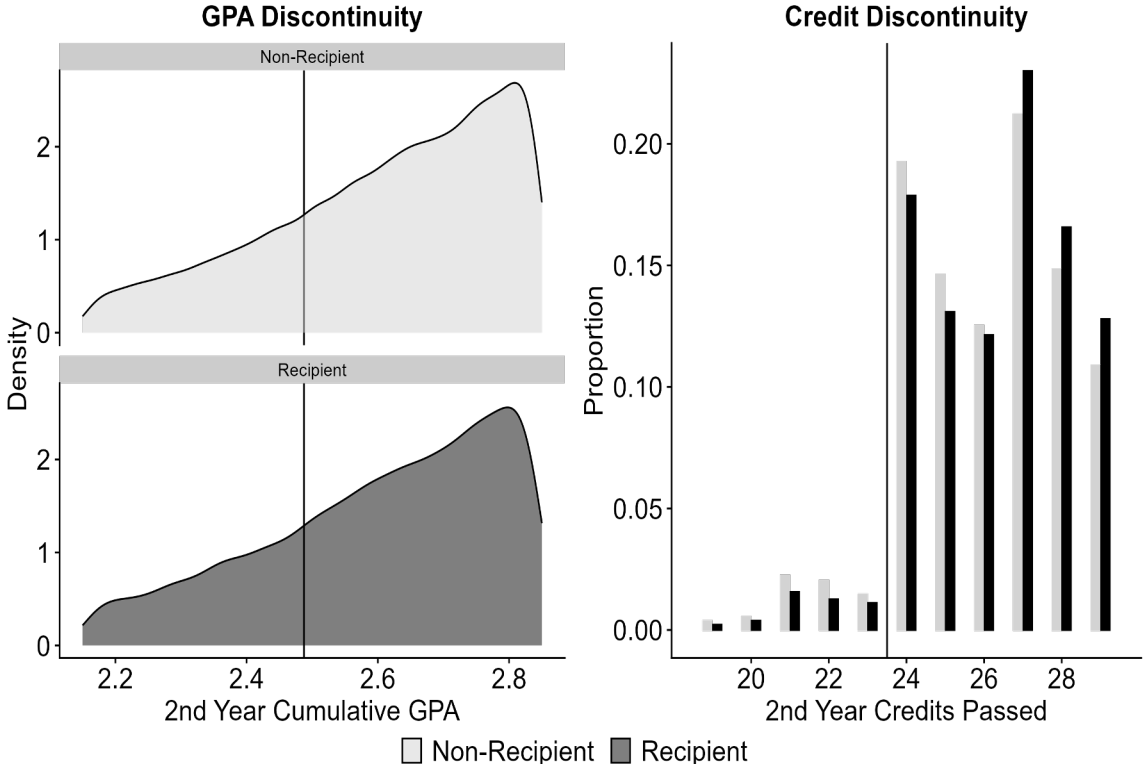

Figure 4. Density Plots — Year 2 Benchmark

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.[13] 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.

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

This is expected, as more students pass all of their courses than fail at least one. Critically, the 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.[14]

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.

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 4 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 diff.-in-disc.

[14] 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.

approach, whereas the Credit and GPA 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 $3,136 for students who narrowly missed both renewal thresholds (Box) to $6,120 for students who satisfied the credit requirement but fell below the GPA benchmark (GPA). The primary driver of this reduction is the $5,000–$6,500 loss from the TEXAS Grant, though students are able to partially offset this loss through other forms of financial aid. Notably, students in the Full and Box specifications receive an additional $1,000 in non-TEXAS Grant gift aid.

To better understand the source of non-Texas Grant gift aid, Appendix Table A.2 presents estimates for the Full specification on all other sources of third-year gift aid observed in the data. Loss of the TEXAS Grant coincides with a $349 decrease in Pell Grant aid, but as shown later, this is attributable to a decline in full-time enrollment, not an overlap with Pell renewal requirements, resulting in students no longer being eligible for the program's maximum award.[15]

While Pell Grant awards decline, other federal and state need-based aid programs show modest increases. Specifically, students receive $113 more from the Supplemental Educational Opportunity Grant (SEOG),[16] $344 more from HB3015,[17] and $212 more from the Texas Public Education Grant (TPEG).[18] Taken together, these three programs account for approximately $650 in additional aid and represent a 50-170% increase relative to students' average second-year awards. In addition, students receive $729 more in other forms of gift aid not shown separately in the table. This category includes smaller state, institutional, or private grants for which the specific source is not available.

All of these programs are need-based and do not require additional applications. Instead, the increases likely reflect a mechanical response to higher financial need after TEXAS Grant loss — students remain eligible, but with more unmet need, award amounts increase. Other forms of aid — including institutional merit aid, categorical federal aid, and tuition exemptions — do not exhibit meaningful changes. These results help explain why the overall decline in gift aid is smaller than the reduction in TEXAS Grant aid. Importantly, the lack of sharp declines in aid from other programs reinforces that the observed effects are attributable to TEXAS Grant loss. To the best of my knowledge, no other major state, federal, or institutional aid programs in Texas use the same

[15]The maximum Pell Grant award is available only to students enrolled full-time. Eligibility is based on expected family contribution (EFC) and enrollment intensity, with awards prorated for part-time students.

[16]The SEOG is a federal need-based grant administered by institutions. Awards are targeted toward Pell-eligible students with exceptional financial need and are subject to limited institutional allocations.

[17]HB3015 refers to state-authorized tuition-set-aside grants, which require institutions to set aside a portion of designated tuition revenue for need-based aid. Awards are typically reserved for Texas residents with financial need.

[18]TPEG is a state-administered, need-based grant available to Texas residents or students attending a public college in Texas. Eligibility is determined by financial need, and awards vary by institution and available funds.

GPA or credit thresholds for continued eligibility — a fact reflected in the relative stability of all other aid sources.

Still, even with some partial replacement from other grants, most students must turn to loans to make up the difference. With the exception of those who fall short only of GPA threshold, students take out an additional $1,628–$2,025 in federal loans. Many also become more likely to borrow the annual maximum in federal loans of $7,500 available to dependent students in their third year or later. This borrowing cap may explain why students do not take on more debt to fully replace the aid they lost.

The muted borrowing response among students who fall short only on GPA may reflect concerns about academic progress, which could limit eligibility for future aid or make students more cautious about taking on additional debt. In contrast, students who meet the GPA requirement but fall short on credits may be more willing to borrow, perceiving the long-run returns to degree completion as worth the additional debt. Work-study participation and outside earnings do not meaningfully respond to aid loss in any specification.

By the fourth year, the effect of losing the TEXAS Grant on total aid diminishes in magnitude. Across the board, reductions in total aid are approximately half the size of the third-year estimates. 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, most students continue to rely on loans to partially offset the loss. They take out an additional $935 in the Full specification, and students near only the credit threshold continue to borrow at high levels, with an increase of $1,910 in fourth-year loans. Many also remain more likely to hit the annual federal loan maximum (7.1 and 13.1 pp, respectively). However, as in earlier years, there is no evidence that students increase their participation in work-study or significantly raise their outside earnings in response to the aid loss.

The final two rows assess the cumulative impact of TEXAS Grant loss on student borrowing after the second year. Students who failed only the credit benchmark take out $4,906 more in federal loans over their remaining college years. Despite significant increases in third- and fourth-year loan uptake, the effect on total subsequent borrowing in the Full specification is not statistically significant. One possible explanation is that students facing aid loss may leave college earlier, thereby reducing their need for additional loans. These outcomes are explored in later sections on persistence and degree completion.

The final row examines whether students are more likely to reach the cumulative federal loan limit of $31,000 for dependent undergraduates. Students near the credit threshold are 7.2 pp more

	Specification			
Aid Component	**Full**	**Box**	**Credit**	**GPA**
Panel A: 3rd-Year Financial Aid				
Total Aid	-3643***	-3136***	-4715***	-6120***
	(431)	(680)	(506)	(1198)
TEXAS Grant	-6238***	-6066***	-5505***	-6465***
	(177)	(116)	(121)	(206)
Non-TG Gift Aid	948***	1053**	-1142***	300
	(268)	(421)	(319)	(752)
Loans	1628***	1756***	2025***	74
	(328)	(516)	(360)	(904)
Federal Loan Maximum	0.092***	0.051	0.103***	0.049
	(0.026)	(0.040)	(0.026)	(0.073)
Work-Study	18	121	-93	-30
	(68)	(107)	(74)	(191)
Earnings	44	98*	-75	-82
	(30)	(52)	(46)	(61)
N	182,137	39,592	125,886	16,659
Panel B: 4th-Year Financial Aid				
Total Aid	-1860***	-1133	-1883***	-3925***
	(491)	(799)	(563)	(1379)
TEXAS Grant	-2796***	-1678***	-3094***	-2352***
	(167)	(269)	(206)	(478)
Non-TG Gift Aid	-11	-227	-654*	-507
	(290)	(486)	(349)	(758)
Loans	935***	736	1910***	-1185
	(353)	(557)	(391)	(975)
Federal Loan Maximum	0.071**	0.029	0.131***	0.017
	(0.028)	(0.044)	(0.031)	(0.078)
Work-Study	12	37	-45	119
	(66)	(108)	(78)	(182)
Earnings	66*	67	42	60
	(36)	(56)	(51)	(80)
Loans After Benchmark	1541	2081	4906***	-4654
	(1120)	(1744)	(1340)	(3080)
Cumulative Federal Loan Maximum	0.028	-0.000	0.072***	-0.019
	(0.026)	(0.041)	(0.026)	(0.071)
N	157,982	35,116	109,449	13,417
Credits Passed Range	≥19	[19,29]	[19,29]	>29
GPA Range	≥ 2.172	[2.172,2.828]	>2.828	[2.172,2.828]

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. The annual federal loan maximum for dependent students is $7,500 in the third year and beyond. The cumulative federal loan maximum is $31,000. *p<0.10; **p<0.05; ***p<0.01.

Table 4. Effects of TEXAS Grant Loss on Subsequent Financial Aid — Year 2 Benchmark

likely to hit this borrowing cap, suggesting that the loss of grant aid accelerates students' reliance on federal loans and pushes many to the upper bound of what they are allowed to borrow.

Overall, regardless of which renewal requirement a student fails to meet, losing the TEXAS Grant leads to a substantial reduction in total financial aid. Students primarily compensate through increased borrowing, rather than additional grants, work-study, or outside employment. Yet the binding constraints of federal loan limits may prevent them from fully replacing the lost aid. This financial gap likely contributes to observed downstream effects on enrollment intensity, time to degree, and graduation outcomes.

6.1.2 Academic Outcomes

Table 5 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 7.9 pp. This effect is even larger for students only near the credit benchmark, where full-time enrollment drops by 27.2 pp. These patterns align with the earlier aid estimates: students close to a renewal threshold reduce enrollment intensity — and thus their cost of attendance — in response to aid loss. However, students near only the GPA threshold do not significantly adjust their enrollment, leaving them with higher tuition costs that are not offset by other aid sources. As a result, they experience a larger decline in total financial aid.

The reduction in full-time enrollment translates into fewer credits attempted and passed. Overall, students attempt 0.94 fewer credits and pass 1.15 fewer credits, while those near only the credit benchmark attempt 3.05 fewer credits and pass 4.14 fewer credits. Estimates from the latter suggest that affected students are not only attempting fewer credits but also experiencing worse academic performance, as seen in the 0.271-point decline in their third-year GPA.[19] Students near both thresholds or only near the GPA threshold do not experience significant changes in any outcomes.

Panel B of Table 5 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 and Credit specifications, persistence decreases by 3.1 pp and 14.8 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 specification. Full-time enrollment drops by 20.3 pp, with students attempting and passing 2.27 and 2.99 fewer credits, respectively. Academic performance also suffers, with fourth-year GPA declining by 0.160 points. At the same time, some students accelerate their credit accumulation. In the Full and Box specifications, students are 4.2 and 6.8 pp, more likely, respectively, to attempt 36 or more credits during their fourth year. These effects, though modest in size, suggest that some students may respond to aid loss by increasing coursework, possibly in an effort to graduate sooner and limit future borrowing. 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

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

	Specification			
Outcome	**Full**	**Box**	**Credit**	**GPA**
Panel A: 3rd-Year Academic Outcomes				
Credits Withdrawn	-0.075	0.102	0.145	-0.148
	(0.174)	(0.281)	(0.200)	(0.485)
Full-Time Enrollment	-0.079***	-0.012	-0.272***	-0.086
	(0.028)	(0.046)	(0.036)	(0.065)
Credits Attempted	-0.944**	-0.240	-3.050***	-1.229
	(0.449)	(0.693)	(0.602)	(1.238)
Attempt 36+	-0.002	0.030	-0.012	-0.014
	(0.018)	(0.026)	(0.023)	(0.063)
Credits Passed	-1.146**	-0.149	-4.135***	-1.517
	(0.515)	(0.812)	(0.660)	(1.407)
GPA	0.001	0.065	-0.271***	-0.069
	(0.045)	(0.074)	(0.060)	(0.113)
N	182,137	39,592	125,886	16,659
Panel B: 4th-Year Academic Outcomes				
Persistence	-0.031*	-0.034	-0.148***	0.060
	(0.017)	(0.027)	(0.023)	(0.050)
Credits Withdrawn	-0.083	-0.125	0.075	-0.151
	(0.150)	(0.246)	(0.205)	(0.383)
Full-Time Enrollment	-0.033	0.044	-0.203***	-0.076
	(0.029)	(0.046)	(0.037)	(0.080)
Credits Attempted	-0.530	0.338	-2.273***	-0.617
	(0.513)	(0.806)	(0.618)	(1.384)
Attempt 36+	0.042**	0.068**	0.010	-0.001
	(0.019)	(0.030)	(0.020)	(0.052)
Credits Passed	-0.737	0.519	-2.989***	-0.679
	(0.572)	(0.915)	(0.681)	(1.503)
GPA	-0.018	0.079	-0.160**	0.035
	(0.052)	(0.085)	(0.068)	(0.138)
N	157,982	35,116	109,449	13,417
Credits Passed Range	≥19	[19,29]	[19,29]	>29
GPA Range	≥ 2.172	[2.172,2.828]	>2.828	[2.172,2.828]

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

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 at any point to compensate for lost 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 most outcomes are negative and similar in magnitude, 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. Students in the Credit specification experience large and sustained negative impacts on nearly every outcome across both years — a pattern that is especially striking given their

academic strength at the time of aid loss. In contrast, students in the Full and Box specifications show mostly null or modest effects during their third year, but by the fourth year, both groups are more likely to attempt 36 or more credits. This pattern suggests that, while some students reduce course loads or disengage, others strategically accelerate their academic progress.

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 6 presents estimates on overall graduation rates, four-, five-, and six-year graduation rates, and time to degree. Overall, losing the TEXAS Grant did not significantly affect degree attainment or graduation rates at the four-, five-, or six-year mark. However, higher-achieving students who lost aid due to insufficient credit accumulation experienced an 11.8 pp decline in Bachelor's degree attainment, along with 19.7 and 17.3 pp reductions in five- and six-year graduation rates, respectively. These declines align with earlier persistence estimates, which showed a large negative effect on fourth-year persistence concentrated among students close to the credit threshold. Paired with a 2.07-month increase in time to graduation among those who eventually earn a degree, these results suggest that loss of the TEXAS Grant not only reduced degree completion for some students, but also delayed it for others. To put this into perspective, 93.7% of recipients in this region who retained the TEXAS Grant eventually earned a bachelor's degree, underscoring that while many students who lose aid do still graduate, their likelihood of doing so is substantially lower.

The observed graduation patterns are further reflected in post-renewal borrowing behavior. While Table 4 previously showed overall loan uptake increased after aid loss for students near just the credit threshold, breaking out loans by graduation status reveals a more nuanced pattern. Among graduates in this group, total subsequent borrowing increased by \$8,070 ($p<0.01$), likely reflecting the extended time to degree. 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 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

	Specification			
Outcome	**Full**	**Box**	**Credit**	**GPA**
Panel A: 3rd-Year Academic Outcomes				
Graduate in 4 Years	0.033	0.037	-0.012	-0.037
	(0.0268)	(0.0405)	(0.0376)	(0.0811)
N	182,137	39,592	125,886	16,659
Graduate in 5 Years	-0.012	0.017	-0.197***	0.011
	(0.0301)	(0.0481)	(0.0398)	(0.0755)
N	159,618	35,913	108,500	15,205
Graduate in 6 Years	-0.014	0.034	-0.173***	-0.013
	(0.0301)	(0.0508)	(0.0392)	(0.0700)
Bachelor's Degree	-0.036	-0.020	-0.118***	0.004
	(0.0277)	(0.0468)	(0.0346)	(0.0631)
N	135,531	31,127	91,170	13,234
Time to Graduate (Months)	-0.613	-2.253	2.069*	1.219
	(0.8980)	(1.5190)	(1.2112)	(2.0846)
N	152,404	29,485	108,967	13,952
Credits Passed Range	≥19	[19,29]	[19,29]	>29
GPA Range	≥ 2.172	[2.172,2.828]	>2.828	[2.172,2.828]

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

completion.

6.1.4 Major Change

Financial aid loss can create strong incentives for students to reevaluate their major selection. As shown in earlier sections, some students responded by increasing their reliance on loans to maintain enrollment. This increased debt burden may itself influence major choice, encouraging students to pursue higher-earning fields in anticipation of future repayment obligations (Rothstein and Rouse, 2011). Further, while I do not find significant effects on reported employment earnings, it is possible that students shifted toward unreported or informal work — such as gig economy jobs or cash-based employment — that are not fully captured in the data. Prior research shows that aid loss can increase student work hours and earnings, which may reduce available time for coursework (Carruthers and Özek, 2016). At the same time, some students responded by accelerating their course accumulation in the fourth year, which aligns with research showing that students often adjust their academic plans to better fit their personal and academic situations (Denice, 2021). These latter two patterns may lead students to switch into less demanding majors in order to better manage their academic workload. These diverging responses highlight three potential mechanisms through which financial aid loss may lead to major switching

To explore these possible mechanisms, Table A.3 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.[20]

Across all specifications, I find no significant effects on the overall likelihood that students change majors following the loss of financial aid. This suggests that, while students make clear adjustments in enrollment intensity, borrowing, and persistence, aid loss does not meaningfully alter whether students change majors. However, among those who do change majors, I observe notable shifts in field of study.

Two years after aid loss, students in the Full specification were 3.6 pp less likely to switch into a STEM major, and students in the GPA specification were 7.7 pp less likely to do so. At the same time, students near only the credit threshold who changed majors were 10.7 pp more likely to move from a STEM major into a non-STEM field. These patterns are reinforced in the graduation results: credit-threshold students who changed majors were 12.6 pp more likely to have exited STEM, and those in the GPA group were 13.1 pp less likely to have switched to a STEM major. This movement away from STEM among credit-threshold students may reflect declines in academic confidence following aid loss; although they began with relatively strong academic records, their GPAs dropped sharply after aid loss, potentially making STEM coursework feel less attainable or sustainable.

These findings suggest that financial aid loss does not trigger widespread major switching, but among those who do switch, it shapes the direction of those changes. Students disproportionately avoid STEM fields, suggesting that concerns about course difficulty, time to completion, or balancing academic demands with work or accelerated graduation timelines may outweigh the appeal of long-run earnings potential in STEM — even in the face of increased student loans. Taken together, the results highlight how financial shocks can shape not just persistence, but longer-term academic trajectories and occupational alignment.

6.1.5 Early-Career Earnings

Earnings outcomes reflect the combined effects of financial aid loss on educational attainment and changes in major trajectory. For students who do not complete their degree, lower earnings are expected. For those who persist and graduate, effects may depend on increased debt burdens or shifts in field of study. As a result, the overall impact on earnings reflects a mixture of these opposing forces.

To separate these dynamics, Table A.4 presents earnings estimates one, two, and three years after students leave college, separately for all students and for graduates.[21] Across all years and

[20] STEM majors are defined based on CIP classifications and include engineering, biological sciences, mathematics/statistics, and physical sciences.

[21] This analysis captures earnings for approximately 63% of students. The data reflect outcomes only for students who have exited college and can be matched to TWC records. Students who remain enrolled, attend graduate school,

outcomes, the clearest pattern emerges for students near only the credit threshold. These students saw consistently negative and, in some cases, significant declines in earnings. For example, among all students, earnings were significantly lower in the first and third years ($5,842 and $6,383, respectively). Among those who graduated, earnings were $3,207 to $5,418 lower, though not statistically significant.

These patterns are consistent with earlier findings as these students were less likely to complete a degree and, among those who did graduate, were significantly more likely to switch out of STEM fields — both of which are associated with lower early-career earnings. The magnitude and persistence of these negative estimates suggest that the consequences of aid loss for this group may extend well beyond enrollment, shaping labor market outcomes through both educational disruption and occupational shifts.

In contrast, estimates for students in the other specifications are generally smaller in magnitude, statistically indistinguishable from zero, and inconsistent in sign. While these groups experienced some academic or financial adjustments, there is no evidence of sustained earnings declines in the years immediately following college exit. This further reinforces the disproportionate impact of aid loss on students only close to the credit threshold.

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 7 presents estimates on the effects of losing the TEXAS Grant after the third-year renewal checkpoint on fourth-year financial aid. Overall declines in total aid are broadly similar to the estimates for third-year aid loss reported in Table 4. However, the estimated impact for students near only the GPA threshold is substantially larger, with total aid falling by over $9,000. These students lost more than $5,000 in gift aid and, unlike other groups, also appear to have reduced their loan borrowing, though the decline is not statistically significant.

In contrast, all other groups followed a similar pattern to those who lost the TEXAS Grant after their second year, partially replacing lost aid with other grants and/or increased borrowing. However, effects on total loan balances after the third-year renewal point are insignificant across

are unemployed in Texas, or work out of state are not included.

Aid Component	Full	Box	Credit	GPA
Total Aid	-3552***	-2597*	-4413***	-9261**
	(951)	(1330)	(572)	(3780)
TEXAS Grant	-5993***	-5836***	-5435***	-6401***
	(164)	(214)	(123)	(821)
Non-TG Gift Aid	1311**	1343	-589	1274
	(613)	(853)	(363)	(2193)
Loans	1281*	1987***	1684***	-4085
	(720)	(1006)	(393)	(3116)
Federal Loan Maximum	0.087	0.080	0.098***	-0.147
	(0.060)	(0.084)	(0.033)	(0.240)
Work-Study	-152	-92	-74	-49
	(145)	(213)	(72)	(504)
Earnings	-1	118	77	-157
	(80)	(109)	(89)	(204)
Loans After Renewal	479	2106	984	-8103
	(1910)	(2753)	(1197)	(7970)
Cumulative Federal Loan Maximum	0.026	-0.025	0.001	-0.101
	(0.058)	(0.083)	(0.028)	(0.232)
N	115,399	17,323	87,086	10,990
Credits Passed Range	≥19	[19,29]	[19,29]	>29
GPA Range	≥ 2.167	[2.167,2.833]	>2.833	[2.167,2.833]

Notes: "Loans After Benchmark" is the cumulative loan amount students take out after their third year. The annual federal loan maximum for dependent students is $7,500 in the third year and beyond. The cumulative federal loan maximum is $31,000. *p<0.10; **p<0.05; ***p<0.01.

Table 7. Effects of TEXAS Grant Loss on Subsequent Financial Aid — Year 3 Benchmark

all specifications, suggesting that overall borrowing adjustments were more limited at this stage. Still, students around the credit threshold who lose the grant after their third year are 9.8 pp more likely to hit the annual federal loan maximum in their fourth year, indicating continued reliance on federal loans to fill the gap. In contrast, there is no significant increase in the likelihood of reaching the cumulative federal loan limit, which is consistent with the fact that these students have fewer remaining years to more heavily rely on loans.

6.2.2 Academic Outcomes

Table 8 presents estimates of the effects of aid loss after the third-year renewal checkpoint on fourth-year academic outcomes. As with the second-year benchmark results in Table 5, the strongest academic impacts are concentrated among students only near the credit threshold. Students in the Box and GPA specifications do not experience consistent or significant academic disruptions.[22]

In the Full specification, aid loss leads to a marginally significant decline of 2.05 credits passed and a 0.204-point reduction in fourth-year GPA, reinforcing the academic consequences of financial instability even late in students' college careers. For those near only the credit threshold, the effects are again substantial: full-time enrollment drops by 19.8 pp, attempted credits fall by 2.44, and passed credits decline by 3.18. Fourth-year GPA also falls by 0.347 points, indicating not only

[22]Students near only the GPA threshold have a large positive estimate on full-time enrollment (46.7 pp), though the estimate is noisy. While suggestive of increased effort or engagement, the imprecision makes it difficult to draw strong conclusions.

Outcome	Full	Box	Credit	GPA
Credits Withdrawn	0.103	0.470	-0.089	-0.616
	(0.344)	(0.517)	(0.244)	(0.993)
Full-Time Enrollment	-0.061	-0.074	-0.198***	0.467**
	(0.060)	(0.084)	(0.043)	(0.235)
Credits Attempted	-1.420	-1.186	-2.435***	0.363
	(0.979)	(1.326)	(0.698)	(3.616)
Attempt 36+	-0.001	-0.001	0.001	-0.166
	(0.036)	(0.049)	(0.021)	(0.145)
Credits Passed	-2.054*	-0.865	-3.182***	1.080
	(1.104)	(1.501)	(0.761)	(3.896)
GPA	-0.204**	0.011	-0.347***	0.149
	(0.104)	(0.149)	(0.082)	(0.346)
N	115,399	17,323	87,086	10,990
Credits Passed Range	≥19	[19,29]	[19,29]	>29
GPA Range	≥ 2.167	[2.167,2.833]	>2.833	[2.167,2.833]

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

reduced course loads but lower academic performance in the courses taken.

Connecting these findings to the financial aid results from Table 7, the over $4,400 loss of total aid resulted in substantial academic setbacks despite these students previously maintaining full-time enrollment and strong academic performance for three years. The results highlight that financial shocks continue to have meaningful academic consequences, even as students approach graduation.

6.2.3 Graduation

The effects of losing the TEXAS Grant after the third-year renewal checkpoint are presented in Table 9. Unlike the second-year renewal results, financial aid loss at this later stage significantly reduced timely graduation rates for all students near at least one renewal threshold. Specifically, five- and six-year graduation rates decreased by 17.4 and 12.4 pp, respectively, though overall degree attainment and time to degree for graduates were not significantly affected.

Students near only the credit threshold experienced similar declines: a 19.0 pp reduction in five-year graduation and a 12.9 pp drop in six-year graduation. Importantly, these students were also 9.0 pp less likely to ever earn a bachelor's degree, underscoring how aid loss late in college can derail degree completion even for students who successfully reached their fourth year. Students near both renewal thresholds also show signs of delayed graduation, including a significant 15.2 pp decrease in four-year graduation rates and large negative (though insignificant) estimates for five- and six-year graduation rates. In contrast, students near only the GPA threshold do not experience significant impacts on graduation rates or degree attainment, echoing patterns from earlier benchmarks.

At this stage in students' academic careers, the decrease in enrollment intensity and credit accumulation documented in Table 8 clearly connects to delayed or disrupted graduation. Unlike

students who lost aid after their second year — who had more time to adjust course loads — those affected after their third year had less flexibility to recover, making financial stability especially crucial as students near the end of their degrees.

Outcome	Full	Box	Credit	GPA
Graduate in 4 Years	-0.065	-0.152**	-0.013	0.141
	(0.0572)	(0.0740)	(0.0465)	(0.2673)
N	115,399	17,323	87,086	10,873
Graduate in 5 Years	-0.174***	-0.105	-0.190***	0.000
	(0.0660)	(0.0933)	(0.0493)	(0.2052)
N	100,000	15,829	74,005	10,056
Graduate in 6 Years	-0.124**	-0.102	-0.129***	0.202
	(0.0600)	(0.0883)	(0.0417)	(0.1954)
Bachelor's Degree	-0.052	-0.051	-0.090**	0.062
	(0.0528)	(0.0767)	(0.0360)	(0.1687)
N	85,435	13,997	62,434	8,908
Time to Graduate (Months)	2.998	2.605	1.688	-1.703
	(1.9877)	(3.0021)	(1.3367)	(5.5906)
N	103,528	13,883	79,635	9,904
Credits Passed Range	≥19	[19,29]	[19,29]	>29
GPA Range	≥ 2.167	[2.167,2.833]	>2.833	[2.167,2.833]

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

6.2.4 Major Change

Appendix Table A.5 presents estimated effects of losing the TEXAS Grant after the third-year renewal checkpoint on major switching. In contrast to the second-year benchmark, there is suggestive evidence that aid loss at this stage may increase the likelihood of changing majors. Among students who ultimately graduated, those in the Full specification were 16.7 pp more likely to switch majors, with an even larger increase of 19.2 pp among students near both renewal thresholds. However, for students who did change majors, there is no consistent evidence of systematic movement into or out of STEM fields.

These results offer some indication that financial aid loss may prompt students to reevaluate their academic path, even late in college. That many of these students were on track to graduate makes this pattern particularly noteworthy — major switching typically occurs earlier in college, when students have more flexibility in their course planning. The timing here suggests that financial stress or changes in academic confidence may lead students to adjust their plans even in the final stages of their degree programs.

6.2.5 Early-Career Earnings

Appendix Table A.6 shows estimates of the effects of aid loss after the third-year renewal checkpoint on early-career earnings. In contrast to the second-year benchmark, these results show no evidence of earnings declines. In fact, students near only the credit threshold appear to experience earnings gains: three years after college exit, earnings are a marginally significant $7,984 higher for all students in this group, with effects for graduates even larger at $10,272. The pattern for other specifications is less clear. While point estimates for the Full and Box groups are consistently positive across all years and samples, none are statistically significant. For the GPA group, estimates vary in sign and remain imprecise throughout, limiting any clear conclusions.

These results stand in contrast to concerns that financial disruption late in college would negatively impact labor market outcomes. One possible explanation is that students may have accumulated more labor market experience prior to graduation — through part-time work, internships, or other employment — which translated to higher early-career earnings. Others may have selected majors with stronger labor market returns in response to financial pressure, though major switching results do not show consistent movement into STEM. While I do not find significant effects on cumulative loan balances overall, it is likely that some students who remained enrolled did so by taking on additional debt than they would have if they had retained the TEXAS Grant, which may have further influenced their post-college career decisions. Regardless of mechanism, these findings suggest that for at least some students, financial aid loss may reshape post-college choices in ways that yield higher early-career earnings.

6.2.6 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 either renewal point did not reduce degree attainment across the board, students who lost aid after their third year experienced significant decreases in five- and six-year graduation rates. This pattern may seem surprising, given that students at this stage have already completed most of their degree requirements and appear well-positioned to graduate. However, the steep decline in timely graduation suggests that financial disruptions late in college may be especially destabilizing — not only because they occur at a more pivotal moment in students' academic trajectories, but also because they are more unexpected. For students who assumed their aid would continue through graduation, the loss may impose sudden financial strain with limited time or flexibility to adjust.

These findings also highlight that the impact of aid loss varies by students' academic standing. Students near the credit threshold consistently exhibited the most negative academic and graduation outcomes, with large drops in enrollment intensity, GPA, and degree attainment at both benchmarks. Among students who lost the TEXAS Grant but did not graduate, average credit accumulation at the time of exit exceeded 80 credits after the second-year benchmark and

95 credits after the third — both well beyond the halfway point to a degree. Moreover, average cumulative GPAs were 3.06 and 3.15, respectively, indicating strong academic performance and consistent progress. These students were not failing out of college; rather, they left despite being academically on track to graduate, suggesting that financial strain played a substantial role in their departure.

In addition to academic performance, some students also altered their academic trajectories. Those near the credit threshold were significantly more likely to switch out of STEM majors after losing aid, suggesting that financial pressures may have driven them toward fields perceived as less demanding or more compatible with work or accelerated graduation. These shifts, along with the observed GPA declines and persistence effects, further underscore the academic strain faced by students who lose aid midstream.

That students withdrew despite being well on track to graduate challenges the notion that non-completion primarily reflects poor academic preparation. Instead, the results suggest that aid loss can create financial roadblocks for students already demonstrating success, particularly when they are close to completion. From a policy perspective, this indicates that interventions targeting these students could meaningfully improve completion rates.

Interestingly, the lack of significant effects on graduation for students near only the GPA threshold aligns with prior research on GPA-based renewal criteria after the first year (Carruthers and Özek, 2016; Jones et al., 2021). This suggests that credit-based requirements may impose a greater risk to degree completion than GPA thresholds, although the relatively small sample of students near only the GPA threshold limits firm conclusions.

Taken together, these results demonstrate that financial aid loss creates a fundamental risk for students — not just in the early years of college, but even after they have made substantial progress. While some students adjust by shifting majors or accelerating course loads, others face fewer viable options and are more likely to leave college without graduating. These findings underscore the importance of not only expanding access to aid but ensuring its stability across a student's college trajectory.

6.3 Heterogeneity by Institutional and Student Characteristics

6.3.1 No Tuition Cap vs. Tuition Cap

To understand how institutional pricing structures shape the consequences of financial aid loss, I examine heterogeneity by tuition cap status. Since the 2005 statutory reforms, all public universities in Texas charge a $50 per credit statutory tuition rate, as mandated by Texas Education Code § 54.051(c) (Texas Legislature, 2023). However, universities differ in how they set their "designated tuition," the institutional component layered on top of statutory tuition. Some institutions charge a fixed rate per credit regardless of total enrollment, while others implement a cap — typically at 12 credits — beyond which additional credits do not increase designated tuition. This cap structure means that once students enroll in a full-time course load, they can take additional credits at a cost

of $50 per credit. Approximately one-third of the universities in my dataset have such a tuition cap, and these institutions account for about 30% of the students in my analysis.

This institutional variation has important implications for the cost of enrolling in heavier course loads. At universities with a tuition cap, students who take more than 12 credits pay only the $50 per-credit statutory tuition for each additional credit, since designated tuition is fixed beyond the cap. In contrast, students at institutions without a tuition cap continue to pay both the $50 statutory tuition and their institution's designated tuition rate for every additional credit. As a result, the marginal cost of enrolling in 15 credits instead of 12 is substantially higher at institutions without a cap. This difference in per-credit costs may influence how students respond to financial aid loss, particularly when deciding whether to maintain or accelerate their pace toward degree completion.

For example, consider a student enrolled in 15 credit hours. At a university with a tuition cap, the student would pay only $150 more than a peer taking 12 credits — reflecting the $50 per-credit statutory tuition cost for each of the three additional credits. At a university without a tuition cap, the student would pay roughly $750 more — the $50 statutory tuition plus a $200 designated tuition per credit.[23]

While this example reflects a single semester, the cost difference compounds quickly: enrolling in three additional credits each semester over two academic years would cost an additional $2,400 at a non-capped institution. Importantly, these marginal cost differences only become relevant once students lose the TEXAS Grant, which covers tuition and fees in full. After aid loss, students must pay tuition out of pocket. At non-capped institutions, the financial burden of taking more than 12 credits is especially high, which may amplify the academic consequences of aid loss by discouraging heavier enrollment, increasing reliance on loans, or prompting students to drop out due to rising educational expenses. Although absolute tuition levels vary across institutions, this example underscores how pricing structures may shape student behavior in the wake of financial aid loss.

The results on academic outcomes presented in Table 10 show similar declines in full-time enrollment across tuition cap status, with students near only the credit threshold significantly likely to enroll in at least 24 credits following aid loss. This similarity is expected, as the decision to drop below full-time status likely reflects broader financial constraints rather than institutional pricing structures. However, differences emerge in total credits attempted. In the third year, students at no-cap institutions reduce their attempted credits by 3.36, compared to a 2.04 credit decline at capped institutions — a pattern suggestive of greater sensitivity to marginal tuition costs. By the fourth year, this pattern reverses, with larger declines among students at capped institutions. The reasons for this shift are unclear but may reflect changes in degree progress, course sequencing, or institutional advising as students near graduation.

Estimates for attempting 36 or more credits do not reveal a consistent pattern across tuition

[23]The $200 designated tuition rate is a representative institutional average across Texas public universities without a tuition cap. Actual designated tuition varies by institution and year.

	No Tuition Cap		Tuition Cap	
Specification	**Full**	**Credit**	**Full**	**Credit**
Panel A: 3rd-Year Academic Outcomes				
Credits Withdrawn	-0.032	0.474**	-0.183	0.819**
	(0.207)	(0.242)	(0.322)	(0.358)
Full-Time Enrollment	-0.094***	-0.296***	-0.044	-0.221***
	(0.035)	(0.043)	(0.046)	(0.068)
Credits Attempted	-0.829	-3.358***	-1.127	-2.042*
	(0.557)	(0.695)	(0.758)	(1.240)
Attempt 36+ Credits	0.010	-0.028	-0.027	0.048
	(0.022)	(0.025)	(0.032)	(0.058)
N	127,824	85,641	54,313	40,245
Panel B: 4th-Year Academic Outcomes				
Credits Withdrawn	-0.016	0.160	-0.236	-0.233
	(0.184)	(0.239)	(0.258)	(0.432)
Full-Time Enrollment	-0.043	-0.210***	-0.011	-0.239***
	(0.036)	(0.045)	(0.049)	(0.068)
Credits Attempted	-0.748	-2.178***	-0.010	-3.138***
	(0.627)	(0.741)	(0.894)	(1.218)
Attempt 36+ Credits	0.031	0.018	0.065*	0.021
	(0.023)	(0.023)	(0.035)	(0.044)
N	109,846	73,721	48,136	35,728
Credits Passed Range	$\geq$19	[19,29]	$\geq$19	[19,29]
GPA Range	$\geq$ 2.172	>2.828	$\geq$ 2.172	>2.828

Notes: "Credits Withdrawn" is the credit value of total withdraws during the given academic year. 4th-Year academic outcomes are conditional on persisting. *p<0.10; **p<0.05; ***p<0.01.

Table 10. Effects of TEXAS Grant Loss on Subsequent Academic Outcomes, By University Tuition Caps — Year 2 Benchmark

cap status. In the fourth year, students at capped institutions are 6.5 pp more likely to enroll in a heavy course load, while those at no-cap institutions show no change. However, this increase is only marginally significant and appears in just one specification. Taken together, these results suggest that differences in pricing structures may not meaningfully affect the likelihood that students attempt particularly heavy course loads following aid loss.

Table 11 explores effects on graduation outcomes, providing some evidence that institutional pricing structures influence students' longer-term academic trajectories. At universities without tuition caps, students near only the credit threshold experience significant declines in six-year graduation rates (20.7 pp) and overall degree attainment (13.6 pp). In contrast, students at capped institutions see smaller and statistically insignificant declines. There are no significant effects on four-year graduation rates at either type of institution, and five-year estimates are similar in magnitude across cap status. Likewise, time to degree among graduates is unaffected.

Taken together, these results offer suggestive evidence that the absence of a tuition cap may contribute to slower credit accumulation, reduced likelihood of timely graduation, and even lower levels of degree completion. However, these effects are concentrated among credit-threshold students

	No Tuition Cap		Tuition Cap	
Outcome	**Full**	**Credit**	**Full**	**Credit**
Graduate in 4 Years	0.029	0.020	0.066	-0.070
	(0.0334)	(0.0446)	(0.0449)	(0.0781)
N	127,824	85,641	54,313	40,245
Graduate in 5 Years	-0.009	-0.190***	-0.006	-0.237***
	(0.0378)	(0.0478)	(0.0491)	(0.0762)
N	112,446	74,086	47,172	34,414
Graduate in 6 Years	-0.009	-0.207***	-0.018	-0.099
	(0.0374)	(0.0466)	(0.0506)	(0.0731)
Bachelor's Degree	-0.032	-0.136***	-0.038	-0.085
	(0.0343)	(0.0415)	(0.0470)	(0.0617)
N	95,622	62,247	39,909	28,923
Time to Graduate (Months)	-0.782	1.475	-0.877	2.540
	(1.1302)	(1.4461)	(1.4634)	(2.4908)
N	105,613	72,971	46,791	35,996
Credits Passed Range	≥19	[19,29]	≥19	[19,29]
GPA Range	≥ 2.172	>2.828	≥ 2.172	>2.828

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 11. Effects of TEXAS Grant Loss on Graduation Outcomes, By University Tuition Caps — Year 2 Benchmark

and are not as large or consistent as one might expect given the cost structure differences. Moreover, the small number of capped institutions warrant caution in drawing strong conclusions.

6.3.2 Student Characteristics

To further assess whether the effects of TEXAS Grant loss vary across different subpopulations, I explore heterogeneity by race/ethnicity, first-generation status, gender, and degree field. Tables A.7 and A.8 report results for Hispanic/Latino and White students. The most notable differences emerge in short-term academic outcomes. Hispanic/Latino students exhibit larger and more immediate disruptions following aid loss, particularly among those near the credit threshold. These students experience significant declines in full-time enrollment and attempt fewer credits in both the third and fourth years. In contrast, White students show little to no short-term academic disruption.

However, both groups ultimately experience statistically significant declines in graduation outcomes. Five- and six-year graduation rates, as well as overall bachelor's degree attainment, fall sharply for students near the credit benchmark, with larger estimated effects for White students. These patterns suggest that while Hispanic/Latino students face more immediate enrollment chal-

lenges, the long-run academic consequences of aid loss are substantial for both groups

Tables A.9 and A.10 examine whether outcomes differ by first-generation status.[24] While both first-generation and non-first-generation students experience negative effects from grant loss, the estimated impacts are notably larger for first-generation students, especially in the short term. In the third year, first-generation students attempt significantly fewer credits — nearly three times the reduction observed for their peers, with estimated effects of -2.46 and -6.80 credits in the full and credit specifications, respectively, compared to -0.73 and -2.41 for non-first-generation students. Additionally, first-generation students continue to exhibit significantly lower rates of full-time enrollment in the fourth year under the full specification.

While short-term academic disruptions are larger for first-generation students, differences in graduation outcomes are more modest. Both groups experience significant declines in five- and six-year graduation rates in the credit specification, but the estimated effects are only descriptively larger for first-generation students. This suggests that while the loss of aid may have particularly sharp short-term consequences for first-generation students, the longer-run impacts on degree attainment are broadly similar across groups.

Tables A.11 and A.12 show that male and female students respond similarly to the loss of financial aid. Both groups exhibit substantial declines in enrollment intensity and credit accumulation in the third and fourth years, concentrated among students near the credit threshold. Estimated effects on graduation outcomes are also similar across genders, with one exception: female students near only the credit threshold take an additional 3.26 months to graduate.

Tables A.13 and A.14 present results by broad degree field.[25] Negative effects of aid loss are concentrated among non-STEM majors, who experience significant declines in enrollment intensity, credit accumulation, and graduation rates when near only the credit threshold. These students attempt fewer credits in both the third and fourth years and are significantly less likely to graduate within five or six years. In contrast, estimates for STEM majors are generally small and statistically insignificant across most outcomes. Notably, there is even a significant positive effect on four-year graduation rates for STEM students in the credit specification. These findings suggest that the consequences of aid loss may be more disruptive for students in non-STEM fields.

6.4 Robustness Checks

To assess the sensitivity of my findings, I conduct a series of robustness checks focusing on academic performance and graduation outcomes — the primary channels through which financial aid loss appears to affect students. These outcomes also represent the most policy-relevant findings

[24] First-generation status is derived from parent education records. Students are classified as first-generation if neither parent attended college, and as non-first-generation if at least one parent did. Students are excluded from this analysis if one parent's education is unknown and the other did not attend college, or if both parents' education levels are missing. As a result, the sum of the first-generation and non-first-generation sample sizes is smaller than that in the full analysis.

[25] STEM majors are defined using the same CIP groupings as in the major choice analysis, including fields in engineering, biological sciences, mathematics/statistics, and physical sciences. All other majors are classified as non-STEM.

in the analysis. I do not conduct robustness checks for major switching or early-career earnings, where effects are limited or inconsistent. Nor do I include checks for the financial aid outcomes, which are mechanically tied to grant eligibility and serve more as confirmation that aid loss occurred. I limit the robustness checks to the Full and Credit specifications and the second-year benchmark, which I emphasize throughout the paper.

Tables 12 and 13 report results from a range of alternative specifications. Columns 1 and 2 present estimates from a regression discontinuity (RD) framework. These specifications exclude non-recipients and remove all terms involving Recipient status from Equations 3 and 4. I include these specifications to illustrate that not accounting for course failure effects — by omitting non-recipients — leads to larger estimated impacts.

Column 3 implements a single running variable approach using a standardized measure of distance from the two renewal thresholds. For each student, I calculate their standardized distance from the GPA and credit completion cutoffs and use the minimum of the two values as the running variable. This approach reflects the fact that students lose eligibility if they fall below either threshold, enabling estimation of the overall effect of aid loss within a unified single-dimensional diff.-in-disc. framework. The optimal bandwidth for this specification is 0.685 standard deviations, which translates to 3 passed credits and 0.328 GPA points.

Columns 4–7 assess the robustness of results to alternative bandwidth choices. Columns 4 and 5 use wider bandwidths — 7 credits around the credit threshold and 0.5 GPA points around the GPA threshold. I do not extend the bandwidths beyond these cutoffs because students who fail more than 8 credits or are 0.5 GPA points below the GPA renewal threshold trigger SAP violations. Columns 6 and 7 use narrower bandwidths of 3 credits and 0.175 GPA points.

Columns 8 and 9 implement an instrumented difference-in-differences (DDIV) framework as an alternative to the multidimensional diff.-in-disc. strategy used in the main analysis. In the Full specification, I replace the single combined instrument with two separate instruments: one for falling below the GPA threshold and one for falling below the credit threshold (each interacted with recipient status). This setup preserves flexible controls for each running variable and their interactions with recipient status, while offering an overidentified specification that leverages multiple sources of exogenous variation. In the Credit specification, the diff.-in-disc. design shown in Equation 4 becomes a standard instrumented diff.-in-diff. by removing the running variable and its interactions from the model entirely.

Panel A of Table 12 shows that the estimated effects on third-year academic outcomes are similar across specifications and closely match the main results presented in Table 5. Across all columns, estimates for full-time enrollment fall between 6 and 10 pp in the Full specification and between 19 and 26 pp in the Credit specification, closely mirroring the 7.9 and 27.2 pp drops in the main analysis. Similarly, estimated impacts on credits attempted and credits passed remain negative and comparable in magnitude, though some alternative specifications yield less precise estimates that are not always statistically significant. For GPA, the negative impact is notably larger in the RD specification without non-recipients (column 2), as expected, since this estimate conflates the

effects of financial aid loss with course failure. GPA estimates in the remaining columns are similar in size to the main results.

Specification	**RD**		**1D Diff.-in-Disc.**	**Diff-in-Disc**				**DDIV**	
Sample	**Full**	**Credit**	**Full**	**Full**	**Credit**	**Full**	**Credit**	**Full**	**Credit**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Panel A: 3rd-Year Academic Outcomes									
Credits Withdrawn	-0.055	0.203	-0.184	0.036	-0.116	-0.024	0.269	-0.221	-0.395
	(0.169)	(0.539)	(0.185)	(0.138)	(0.275)	(0.253)	(0.197)	(0.145)	(0.511)
Full-Time Enrollment	-0.076***	-0.210**	-0.068**	-0.073***	-0.195***	-0.097**	-0.264***	-0.062**	-0.252**
	(0.027)	(0.106)	(0.029)	(0.022)	(0.049)	(0.041)	(0.034)	(0.027)	(0.102)
Credits Attempted	-1.032**	-0.956	-0.697	-0.627*	-0.621	-0.852	-3.415***	-0.665	-2.479
	(0.429)	(1.706)	(0.472)	(0.363)	(0.841)	(0.653)	(0.562)	(0.455)	(1.689)
Credits Passed	-1.501***	-3.398*	-0.855	-0.890**	-1.659*	-1.220	-4.306***	-0.722	-4.555***
	(0.495)	(1.890)	(0.543)	(0.417)	(0.893)	(0.755)	(0.621)	(0.484)	(1.751)
GPA	-0.029	-0.753***	0.037	-0.012	-0.207***	(0.048)	-0.271***	0.036	-0.301***
	(0.044)	(0.179)	(0.047)	(0.036)	(0.076)	(0.066)	(0.057)	(0.035)	(0.118)
N	41,198	26,684	141,946	251,547	158,275	125,894	97,059	182,137	125,886
Panel B: 4th-Year Academic Outcomes									
Persistence	-0.015	0.021	-0.045**	-0.023	-0.107***	-0.059**	-0.152***	-0.013	-0.104
	(0.016)	(0.053)	(0.018)	(0.014)	(0.029)	(0.025)	(0.022)	(0.021)	(0.081)
Credits Withdrawn	-0.027	0.715	-0.123	-0.015	0.106	-0.009	0.039	-0.276**	0.183
	(0.144)	(0.517)	(0.159)	(0.118)	(0.285)	(0.217)	(0.198)	(0135)	(0.467)
Full-Time Enrollment	-0.060**	-0.112	-0.043	-0.051**	-0.301***	-0.047	-0.167***	-0.032	-0.185*
	(0.028)	(0.103)	(0.031)	(0.024)	(0.053)	(0.043)	(0.035)	(0.030)	(0.112)
Credits Attempted	-0.888*	-0.379	-0.666	-0.633	-3.588***	-0.578	-1.847***	-0.529	-1.863
	(0.489)	(1.799)	(0.546)	(0.418)	(0.885)	(0.743)	(0.601)	(0.485)	(1.751)
Credits Passed	-1.328**	-2.046	-0.872	-0.820*	-4.521***	-0.904	-2.469***	-0.453	-3.146*
	(0.548)	(1.972)	(0.608)	(0.466)	(0.996)	(0.830)	(0.660)	(0.512)	(1.810)
GPA	-0.048	-0.463**	-0.012	-0.017	-0.182*	-0.006	-0.194***	0.039	-0.096
	(0.051)	(0.194)	(0.055)	(0.042)	(0.099)	(0.077)	(0.066)	(0.042)	(0.141)
N	39,399	25,173	122,384	216,063	135,979	108,748	83,899	157,982	109,449
Includes Non-Recipients?	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Credits Passed Range	≥19	[19,29]	≥21	≥17	[17,31]	≥21	[21,27]	≥19	[19,29]
GPA Range	≥ 2.172	>2.828	≥2.172	≥2	>3	≥2.325	>2.675	≥2.172	>2.828

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 12. Academic Outcomes Robustness Check

Panel B of Table 12 shows that the fourth-year academic outcome estimates are also broadly similar with the results reported in Table 5. Estimates for persistence, full-time enrollment, credits attempted, and credits passed remain negative and significant across most specifications. As in the third-year outcomes, the estimated impact on fourth-year GPA is notably larger in the RD specification, while estimates from the other specifications are more closely aligned with those reported in Table 5.

Consistent with the academic outcomes, Table 13 shows estimates for degree attainment and graduation rates are broadly similar across specifications, with some notable differences. As expected, columns 1 and 2 produces larger negative estimates, with degree attainment becoming marginally significant for the Full specification. Additionally, in column 3, estimates on both five- and six-year graduation rates and overall degree attainment are negative and statistically significant, suggesting that financial aid loss may hamper timely degree completion regardless of which

threshold a student is near. Across the remaining specifications, estimates are similar to those reported in Table 6, both in terms of magnitude and significance.

Specification	**RD**		**1D Diff.-in-Disc.**	**Diff-in-Disc**				**DDIV**	
Sample	**Full**	**Credit**	**Full**	**Full**	**Credit**	**Full**	**Credit**	**Full**	**Credit**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Graduate in 4 Years	0.034	-0.199*	0.003	0.022	0.089	0.033	-0.016	0.040	-0.089***
	(0.0259)	(0.1053)	(0.0234)	(0.0213)	(0.0553)	(0.0268)	(0.0353)	(0.0293)	(0.0224)
N	41,918	26,684	141,946	251,547	158,275	182,137	98,059	182,137	125,886
Graduate in 5 Years	-0.046	-0.336***	-0.071***	-0.028	-0.168***	-0.012	-0.138***	0.001	-0.302***
	(0.0290)	(0.1177)	(0.0257)	(0.0239)	(0.0550)	(0.0301)	(0.0370)	(0.0254)	(0.0910)
N	35,796	22,282	125,041	219,340	135,256	159,618	84,082	159,618	108,500
Graduate in 6 Years	-0.040	-0.277**	-0.067***	-0.041*	-0.153***	-0.014	-0.122***	-0.007	-0.227***
	(0.0291)	(0.1090)	(0.0254)	(0.0240)	(0.0551)	(0.0301)	(0.0365)	(0.238)	(0.0802)
Bachelor's Degree	-0.054**	-0.261***	-0.064***	-0.052**	-0.118**	-0.036	-0.119***	-0.023	-0.198***
	(0.0270)	(0.0969)	(0.0233)	(0.0222)	(0.0488)	(0.0277)	(0.0322)	(0.0204)	(0.0655)
N	29,806	18,329	106,506	185,894	113,156	135,531	70,870	135,531	91,170
Time to Graduate (Months)	-0.438	4.145	0.230	-0.153	-1.977	-0.613	0.611	-0.331	2.064***
	(0.8592)	(3.4997)	(0.7633)	(0.7236)	(1.6615)	(0.8980)	(1.1473)	(0.8146)	(0.5949)
N	33,768	22,510	117,312	213,534	140,225	152,404	82,472	152,404	108,967
Includes Non-Recipients?	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Credits Passed Range	≥19	[19,29]	≥21	≥17	[17,31]	≥21	[21,27]	≥19	[19,29]
GPA Range	≥ 2.172	>2.828	≥2.172	≥2	>3	≥2.325	>2.675	≥2.172	>2.828

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 13. Graduation Outcomes Robustness Check

Taken together, these robustness checks demonstrate that the main academic and graduation outcomes are consistent across a range of alternative specifications and bandwidth choices. The effects of financial aid loss remain negative across models, highlighting the vulnerability of students to aid loss — especially those near the credit threshold, who face heightened academic and completion risks despite otherwise strong performance.

7 Conclusion

This study examines the consequences of losing financial aid after second- and third-year renewal checkpoints for a range of students, highlighting how the timing and nature of aid loss shape 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 degree completion.

Losing the TEXAS Grant after the second year triggered immediate academic disruptions for many students, including reductions in enrollment intensity, GPA, and persistence. These impacts were most pronounced among students who fell short of the credit renewal requirement, despite otherwise strong academic performance. For these students, their likelihood of graduating fell substantially. Students who lost aid after the third year experienced similar reductions in full-

time enrollment and credit accumulation but had even fewer opportunities to adjust. As a result, timely graduation rates fell sharply, particularly for students near the credit threshold. In both cases, students who dropped out had already accumulated the majority of required credits and maintained high cumulative GPAs, underscoring that financial constraints — rather than academic struggles — drove many departures.

This study contributes to the financial aid literature by moving beyond first-year benchmarks to examine how mid-college aid loss affects student trajectories. The findings emphasize that aid stability in later years is critical for ensuring degree completion and highlight how even academically successful students remain vulnerable to financial shocks. Unlike aid loss early in college, which may be anticipated and easier to recover from, later-stage aid loss occurs when students have fewer options: some persist by reducing their course loads, others take on more debt, and a substantial share ultimately exit without earning a degree.

Finally, the study offers new insight into the heterogeneity of student responses. The most severe consequences are concentrated among students who fail to meet credit completion requirements, suggesting that existing aid renewal policies may insufficiently differentiate between indicators of academic potential and indicators of academic struggle. Additional analyses show that institutional tuition structures also moderate these effects as students at universities without a tuition cap suffer more severe timely graduation impacts. These patterns underscore that the consequences of aid loss are shaped not only by eligibility thresholds, but also by institutional context.

While this study provides important new evidence on the consequences of financial aid loss, the findings should be interpreted with care regarding their generalizability. The TEXAS Grant program is relatively unique in its use of a credit completed renewal requirement, in contrast to many state and institutional aid programs that monitor GPA and/or credits attempted. As a result, the substantial declines in persistence and degree attainment among students narrowly missing the credit requirement may not fully extend to settings where renewal criteria are less stringent or differently structured. Within the TEXAS Grant population, the analysis sample focuses on students near at least one renewal threshold, representing 38.4% of second-year recipients who persisted into the third year. Notably, students only near the credit discontinuity account for 24.4% of all second-year recipients, highlighting that the credit analysis covers a substantial and policy-relevant portion of the broader recipient pool. Thus, while the findings apply most directly to a subset of students, they capture a meaningful share of those navigating financial aid renewal in practice.

In addition to the renewal structure, the magnitude and nature of the effects differ from those documented in prior studies of aid loss. Existing research has focused on merit-based programs, such as Tennessee's and Georgia's HOPE scholarships, finding that aid loss early in students' academic careers produces only modest impacts on enrollment and graduation outcomes. In contrast, the later timing of aid loss in this study, coupled with the need-based nature of the TEXAS Grant, likely amplifies the disruptive effects. Moreover, the most severe impacts here are concentrated among students who maintain relatively strong GPAs but fail to meet credit accumulation requirements

— a group largely overlooked in prior research focused on GPA-based eligibility failures. This distinction highlights the importance of considering how the specific design of renewal benchmarks interacts with students' academic trajectories when evaluating the consequences of financial aid loss.

Finally, relative to the extensive body of literature demonstrating that financial aid receipt improves enrollment, persistence, and graduation outcomes, these findings suggest that losing financial aid can have even more pronounced and damaging effects. For example, Castleman and Long (2016) find that expanding access to the Florida Student Assistance Grant increased six-year graduation rates by 4.6 pp (22%), while Denning et al. (2019) find that expanding Pell Grant access increased six-year graduation rates by 3.4 pp (9%). In contrast, this study finds that losing aid reduces six-year graduation rates by 17.3 pp, corresponding to a 19.1% decline relative to continued recipients. Although the absolute decline is much larger in this study, baseline graduation rates among continued TEXAS Grant recipients are substantially higher, leading to a similar percent change across settings. While the specific size of the financial aid gains and losses differs across studies, the relative effects on degree attainment are broadly comparable. The sudden withdrawal of financial support after significant academic investment appears to be particularly destabilizing, underscoring the importance of designing renewal criteria that balance academic standards with recognition of students' ongoing progress toward degree completion.

7.1 Policy Implications and Future Research

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 is the introduction of a probationary period following aid loss. Under such a policy, students who narrowly miss renewal requirements could either retain the TEXAS Grant temporarily during the subsequent year, with continued eligibility contingent on meeting both GPA and credit benchmarks, or lose aid initially but regain it if they satisfy the requirements by the end of the next year. Descriptive evidence suggests that providing students a path to requalification could meaningfully improve outcomes: among the 5,156 students who fell below at least one threshold and lost the TEXAS Grant after their second year, 1,762 (34%) subsequently met both renewal thresholds by the end of their third year. This likely understates the true potential impact of a probationary or requalification policy. Currently, the loss of financial aid is associated with sharp declines in full-time enrollment, making it more difficult for students to satisfy credit completion requirements even if they are otherwise academically capable. Allowing students to maintain or regain eligibility based on demonstrated academic progress could preserve financial support for students who recover from temporary setbacks and promote higher rates of

degree attainment. While this study cannot directly estimate the effects of regaining aid, the strong negative consequences of aid loss suggest that restoring financial support would likely mitigate some of the adverse academic and enrollment impacts documented here.

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.

As an alternative to modifying the credit completion metric, policymakers could also consider introducing a one-time course failure waiver. Under such a policy, students who attempt a full-time course load but fail 1-2 courses — resulting in narrowly missing the 24-credit requirement — would retain eligibility for the TEXAS Grant. Such a policy could have meaningful impacts on degree completion: the 2,252 and 828 students in the credit specification who lost the TEXAS Grant after their second or third year, respectively, could have retained their aid under such a waiver. Applying the estimated effects of aid loss on graduation rates, this policy could have led to roughly 340 additional degrees.[26] While this is only a suggestive calculation, the strong negative effects of aid loss on degree attainment imply that preserving financial support for students who experience minor academic setbacks could substantially improve graduation outcomes.

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

[26] $(2252 \times 0.118) + (828 \times 0.090) = 340.256$

to aid loss, particularly in relation to employment decisions, borrowing behavior, and long-term labor market outcomes.

While future research is needed to better understand other forms of aid disruption, the evidence presented here highlights the unintended consequences of existing renewal criteria. Aid loss at later stages of college can severely disrupt persistence and degree completion, particularly for students who have already demonstrated academic potential. These findings should not be interpreted as an argument for eliminating aid renewal requirements, however. 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. Yet the current structure of many renewal policies fails to account for the realities of student progress and financial vulnerability. Rather than fostering persistence and completion, these policies can inadvertently push students out of college, even when they remain on track to graduate. A more balanced approach would preserve academic expectations while providing students with greater flexibility to recover from setbacks and continue progressing toward a degree.

In light of these findings, it is important to recognize that the ultimate goal of financial aid programs is not merely to expand college access, but to support students through to degree 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 better account for different student circumstances and patterns of academic progress, policymakers can help ensure that financial aid fulfills its intended purpose — not just opening the door to college, but helping students cross the finish line.

8 Appendix

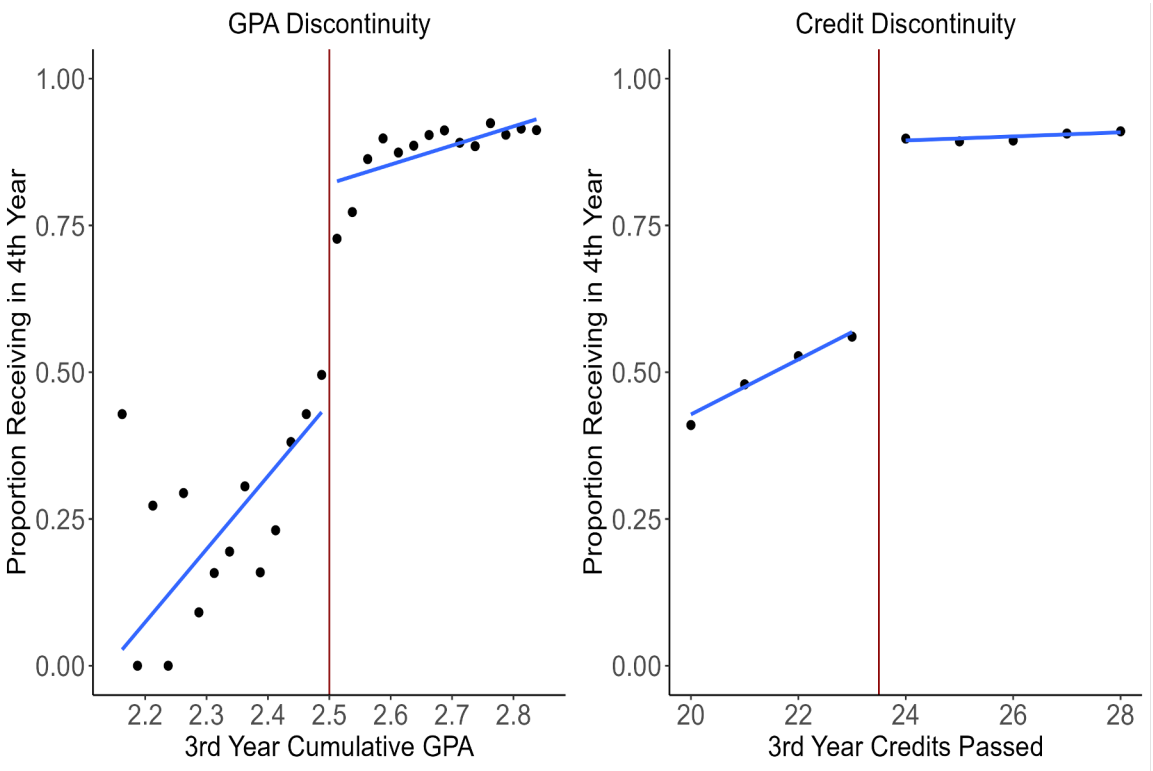

Figure A.1. First Stage — Year 3 Benchmark

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	0.021	Unknown	-0.014	STEM Major	0.035	UT-Austin	-0.029
	(0.0239)		(0.0268)		(0.0257)		(0.0207)
Male	0.005	<$20,000	0.016	Cumulative GPA	0.066***	Texas A&M	0.028
	(0.0280)		(0.0125)		(0.0082)	College Station	(0.0213)
White	0.068**	$20k–$39,999	0.014	Credits Attempted	0.258	UT-Dallas	0.007
	(0.0269)		(0.0155)		(0.2132)		(0.0111)
Black	-0.011	$40k–$59,999	-0.014	Credits Passed	0.591***	Texas Southern	-0.014***
	(0.0157)		(0.0159)		(0.2238)		(0.0049)
Hispanic/Latino	-0.047*	$60k–$79,999	-0.004	Math Credits Attempted	0.167	UT-Brownsville	-0.003
	(0.0247)		(0.0151)		(0.1686)		(0.0025)
First-Generation	-0.044**	$80,000+	0.002	Science Credits Attempted	0.233	Sul Ross State	-0.002
	(0.0182)		(0.0252)		(0.3331)		(0.0023)
N	115,399	**N**	115,399	**N**	115,399	**N**	115,399

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, biological sciences, 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

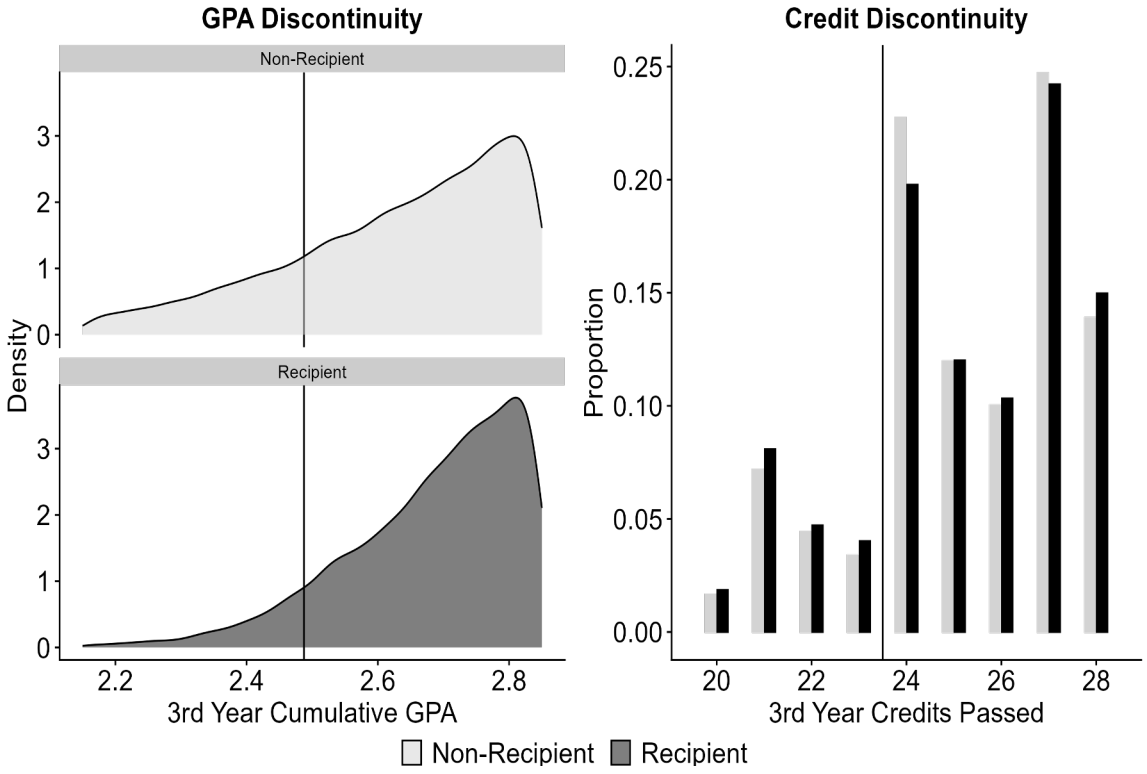

Figure A.2. Density Plots — Year 3 Benchmark

Aid Source	Estimate	Year 2 Recipient Mean
Panel A: Federal Need-Based		
Pell Grant	-349*	5,452
	(183)	
SEOG	113***	67
	(30)	
Categorical Aid	-23	381
	(97)	
Panel B: State Need-Based		
HB3015 Grants	344***	824
	(129)	
HB3015 Other	-11	1
	(13)	
TPEG	212**	491
	(84)	
Panel C: Other Need-Based / Exemptions		
Student Deposit Fund Scholarship	12	9
	(11)	
Other Grants	729***	773
	(283)	
Tuition Exemptions and Waivers	-53	347
	(167)	
Panel D: Merit-Based		
Texas Top 10% Scholarship	34***	37
	(5)	
Institutional Merit Aid	-34	813
	(183)	
N	182,137	41,926

Notes: This table shows estimated effects on non-TEXAS Grant aid sources for students in the Full specification. "Other Grants" includes all other forms of grants not itemized in the above table. "Year 2 Recipient Mean" refers to the average amount received by TEXAS Grant recipients in Year 2. *p<0.10; **p<0.05; ***p<0.01.

Table A.2. Effects on Other Sources of Gift Aid — Year 2 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	0.009	-0.024	-0.020	0.016	-0.036**	0.011	0.018	-0.028	0.026
	(0.029)	(0.027)	(0.037)	(0.030)	(0.017)	(0.030)	(0.036)	(0.024)	(0.036)
N	182,137	51,094	51,094	157,982	73,717	73,717	155,757	54,066	54,066
Box	0.040	-0.052	-0.036	0.012	-0.035	-0.016	0.014	-0.027	-0.011
	(0.047)	(0.045)	(0.058)	(0.048)	(0.029)	(0.047)	(0.059)	(0.040)	(0.057)
N	39,592	13,318	13,318	35,116	17,802	17,802	29,884	13,266	13,266
Credit	0.023	0.006	0.082*	-0.004	0.014	0.107**	-0.008	-0.036	0.126**
	(0.038)	(0.044)	(0.048)	(0.038)	(0.026)	(0.042)	(0.048)	(0.047)	(0.054)
N	125,886	32,825	32,825	109,449	49,634	49,634	111,593	35,408	35,408
GPA	0.049	-0.026	-0.016	-0.055	-0.077*	0.015	0.006	-0.131**	0.043
	(0.075)	(0.068)	(0.106)	(0.083)	(0.042)	(0.080)	(0.086)	(0.056)	(0.093)

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.3. 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	1203	1786	-542	704	1263	-151
	(1557)	(2036)	(2444)	(1781)	(2304)	(2808)
N	114,604	92,856	75,069	104,711	85,055	68,705
Box	1224	905	-2446	-128	-1193	-2933
	(2335)	(3297)	(3854)	(2754)	(3857)	(4524)
N	26,571	21,887	18,184	22,037	18,349	15,240
Credit	-5842**	-4081	-6383*	-4757	-3207	-5418
	(2527)	(3108)	(3841)	(2937)	(3565)	(4435)
N	76,519	61,352	48,872	72,168	57,884	46,106
GPA	-1741	4864	-2743	-55	8700*	-1622
	(3920)	(4955)	(6267)	(4103)	(5156)	(6635)
N	11,514	9,617	8,013	10,506	8,822	7,359

Notes: Earnings are calculated starting with the first full calendar 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.4. 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	0.021	-0.010	0.003	0.167**	-0.039	0.006
	(0.051)	(0.059)	(0.101)	(0.076)	(0.061)	(0.070)
N	115,399	33,732	33,732	104,613	31,031	31,031
Box	-0.001	-0.095	0.039	0.192*	-0.070	-0.006
	(0.073)	(0.064)	(0.132)	(0.105)	(0.070)	(0.082)
N	18,045	4,807	4,807	14,936	5,960	5,960
Credit	0.057	-0.025	-0.024	0.039	-0.040	-0.003
	(0.036)	(0.025)	(0.062)	(0.052)	(0.040)	(0.041)
N	87,086	26,109	26,109	80,518	21,345	21,345
GPA	-0.270	0.213	-0.434	0.340	-0.015	-0.153
	(0.192)	(0.197)	(0.273)	(0.272)	(0.125)	(0.101)
N	10,873	2,870	2,870	9,987	3,937	3,937

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.5. 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	5134	3632	3295	4408	2561	2836
	(3517)	(4029)	(5768)	(3743)	(4352)	(6244)
N	69,609	55,830	43,941	67,013	53,908	42,423
Box	3195	6879	1445	3896	6785	5745
	(4297)	(5478)	(7696)	(4753)	(6134)	(8311)
N	11,359	9,363	7,557	10,161	8,442	6,827
Credit	4742	1663	7984*	5305	2668	10272**
	(3195)	(3801)	(4575)	(3419)	(4016)	(4893)
N	50,957	40,342	31,294	49,858	39,579	30,701
GPA	3009	-24007	19185	3833	-18834	6800
	(21257)	(26572)	(58711)	(18187)	(20667)	(37081)
N	6,238	5,217	4,303	5,990	4,980	4,142

Notes: Earnings are calculated starting with the first full calendar 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.6. Effects of TEXAS Grant Loss on Early Career Earnings — Year 3 Benchmark

	Hispanic/Latino		White	
Specification	**Full**	**Credit**	**Full**	**Credit**
Panel A: 3rd-Year Academic Outcomes				
Credits Withdrawn	-0.036	0.135	-0.558	-0.127
	(0.262)	(0.314)	(0.398)	(0.479)
Full-Time Enrollment	-0.094**	-0.273***	-0.036	-0.126
	(0.042)	(0.057)	(0.066)	(0.083)
Credits Attempted	-1.094	-2.816***	0.135	-0.663
	(0.676)	(0.958)	(1.089)	(1.364)
Attempt 36+ Credits	0.014	-0.003	0.008	-0.051
	(0.026)	(0.035)	(0.048)	(0.060)
N	59,382	39,170	82,780	60,657
Panel B: 4th-Year Academic Outcomes				
Credits Withdrawn	-0.072	-0.333	-0.066	0.174
	(0.229)	(0.315)	(0.349)	(0.521)
Full-Time Enrollment	-0.034	-0.184***	-0.038	-0.155
	(0.044)	(0.058)	(0.070)	(0.095)
Credits Attempted	-0.224	-1.866*	-1.313	-1.672
	(0.778)	(0.964)	(1.191)	(1.442)
Attempt 36+ Credits	0.046*	-0.031	0.016	-0.002
	(0.027)	(0.029)	(0.043)	(0.051)
N	51,421	33,877	71,544	52,654
Credits Passed Range	$\geq$19	[19,29]	$\geq$19	[19,29]
GPA Range	$\geq$ 2.172	>2.828	$\geq$ 2.172	>2.828

Notes: "Credits Withdrawn" is the credit value of total withdraws during the given academic year. 4th-Year academic outcomes are conditional on persisting. *p<0.10; **p<0.05; ***p<0.01.

Table A.7. Effects of TEXAS Grant Loss on Subsequent Academic Outcomes, By Race/Ethnicity — Year 2 Benchmark

	Hispanic/Latino		White	
Specification	**Full**	**Credit**	**Full**	**Credit**
Graduate in 4 Years	0.035	-0.028	0.055	0.133
	(0.0394)	(0.0579)	(0.0706)	(0.1014)
N	59,382	39,170	82,780	60,657
Graduate in 5 Years	0.002	-0.150**	-0.007	-0.213**
	(0.0447)	(0.0632)	(0.0727)	(0.1007)
N	51,016	32,930	73,735	53,357
Graduate in 6 Years	0.008	-0.123**	0.002	-0.261***
	(0.0448)	(0.0628)	(0.0707)	(0.0986)
Bachelor's Degree	0.000	-0.099*	-0.055	-0.176**
	(0.0410)	(0.0539)	(0.0641)	(0.0883)
N	42,355	26,997	63,620	45,586
Time to Graduate (Months)	-0.901	1.628	-2.578	-2.529
	(1.3860)	(1.8273)	(2.1354)	(2.6755)
N	48,219	33,031	71,682	53,724
Credits Passed Range	≥19	[19,29]	≥19	[19,29]
GPA Range	≥ 2.172	>2.828	≥ 2.172	>2.828

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 A.8. Effects of TEXAS Grant Loss on Graduation Outcomes, By Race/Ethnicity — Year 2 Benchmark

	Non-First-Generation		First-Generation	
Specification	**Full**	**Credit**	**Full**	**Credit**
Panel A: 3rd-Year Academic Outcomes				
Credits Withdrawn	-0.217	0.299	0.042	0.649
	(0.266)	(0.295)	(0.355)	(0.480)
Full-Time Enrollment	-0.097**	-0.257***	-0.122**	-0.378***
	(0.042)	(0.052)	(0.056)	(0.089)
Credits Attempted	-0.730	-2.414***	-2.463***	-6.804***
	(0.687)	(0.893)	(0.896)	(1.573)
Attempt 36+ Credits	-0.003	0.009	-0.062*	-0.077
	(0.030)	(0.036)	(0.033)	(0.058)
N	118,097	84,741	26,315	16,965
Panel B: 4th-Year Academic Outcomes				
Credits Withdrawn	-0.411*	0.167	0.389	0.217
	(0.227)	(0.309)	(0.305)	(0.489)
Full-Time Enrollment	0.008	-0.224***	-0.129**	-0.168*
	(0.043)	(0.056)	(0.060)	(0.090)
Credits Attempted	-0.335	-2.522***	-1.050	-2.654*
	(0.766)	(0.913)	(1.066)	(1.593)
Attempt 36+ Credits	0.052*	-0.008	0.050	-0.007
	(0.030)	(0.030)	(0.038)	(0.052)
N	103,454	74,421	22,692	14,597
Credits Passed Range	≥19	[19,29]	≥19	[19,29]
GPA Range	≥ 2.172	>2.828	≥ 2.172	>2.828

Notes: "Credits Withdrawn" is the credit value of total withdraws during the given academic year. 4th-Year academic outcomes are conditional on persisting. *p<0.10; **p<0.05; ***p<0.01.

Table A.9. Effects of TEXAS Grant Loss on Academic Outcomes, By First-Generation Status — Year 2 Benchmark

	Non-First Generation		First Generation	
Specification	**Full**	**Credit**	**Full**	**Credit**
Graduate in 4 Years	-0.002	0.040	0.044	-0.099
	(0.0426)	(0.0578)	(0.0545)	(0.0907)
N	118,097	84,741	26,315	16,965
Graduate in 5 Years	-0.012	-0.181***	-0.005	-0.268***
	(0.0464)	(0.0567)	(0.0584)	(0.0929)
N	102,237	72,301	22,948	14,562
Graduate in 6 Years	-0.001	-0.159***	-0.037	-0.209***
	(0.0464)	(0.0570)	(0.0576)	(0.0832)
Bachelor's Degree	-0.003	-0.100**	-0.078	-0.193***
	(0.0419)	(0.0496)	(0.0540)	(0.0693)
N	84,397	59,181	19,180	12,062
Time to Graduate (Months)	0.898	0.112	-2.695	2.899
	(1.3362)	(1.7132)	(1.7342)	(2.9502)
N	100,060	74,050	21,477	14,472
Credits Passed Range	≥19	[19,29]	≥19	[19,29]
GPA Range	≥ 2.172	>2.828	≥ 2.172	>2.828

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 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 A.10. Effects of TEXAS Grant Loss on Graduation Outcomes, By First-Generation Status — Year 2 Benchmark

	Male		Female	
Specification	**Full**	**Credit**	**Full**	**Credit**
Panel A: 3rd-Year Academic Outcomes				
Credits Withdrawn	-0.201	0.083	0.058	0.179
	(0.265)	(0.334)	(0.229)	(0.240)
Full-Time Enrollment	-0.078*	-0.256***	-0.082***	-0.282***
	(0.042)	(0.052)	(0.038)	(0.050)
Credits Attempted	-0.528	-2.806***	-1.286**	-3.233***
	(0.624)	(0.815)	(0.603)	(0.866)
Attempt 36+ Credits	-0.012	-0.006	0.007	-0.018
	(0.023)	(0.031)	(0.028)	(0.034)
N	79,962	53,109	102,175	72,777
Panel B: 4th-Year Academic Outcomes				
Credits Withdrawn	-0.335	-0.245	0.135	0.348
	(0.232)	(0.330)	(0.203)	(0.257)
Full-Time Enrollment	0.004	-0.162***	-0.064	-0.228***
	(0.043)	(0.054)	(0.040)	(0.051)
Credits Attempted	-0.354	-1.505*	-0.658	-2.831***
	(0.740)	(0.871)	(0.690)	(0.873)
Attempt 36+ Credits	0.022	0.009	0.058**	0.010
	(0.026)	(0.027)	(0.027)	(0.029)
N	70,395	47,092	87,587	62,357
Credits Passed Range	$\geq$19	[19,29]	$\geq$19	[19,29]
GPA Range	$\geq$ 2.172	>2.828	$\geq$ 2.172	>2.828

Notes: "Credits Withdrawn" is the credit value of total withdraws during the given academic year. 4th-Year academic outcomes are conditional on persisting. *p<0.10; **p<0.05; ***p<0.01.

Table A.11. Effects of TEXAS Grant Loss on Academic Outcomes, By Gender — Year 2 Benchmark

	Male		Female	
Specification	**Full**	**Credit**	**Full**	**Credit**
Graduate in 4 Years	0.028	0.022	0.037	-0.042
	(0.0365)	(0.0522)	(0.0384)	(0.0533)
N	79,962	53,109	102,175	72,777
Graduate in 5 Years	-0.021	-0.179***	0.000	-0.215***
	(0.0440)	(0.0597)	(0.0410)	(0.0538)
N	70,119	45,749	89,499	62,751
Graduate in 6 Years	-0.008	-0.170***	-0.013	-0.182***
	(0.0449)	(0.0587)	(0.0404)	(0.0531)
Bachelor's Degree	-0.020	-0.141***	-0.044	-0.107***
	(0.0413)	(0.0516)	(0.0373)	(0.0467)
N	59,628	38,513	75,903	52,657
Time to Graduate (Months)	0.137	0.440	-1.268	3.255**
	(1.3455)	(1.7848)	(1.2077)	(1.6393)
N	65,573	45,323	86,831	63,644
Credits Passed Range	≥19	[19,29]	≥19	[19,29]
GPA Range	≥ 2.172	>2.828	≥ 2.172	>2.828

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 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 A.12. Effects of TEXAS Grant Loss on Graduation Outcomes, By Gender — Year 2 Benchmark

	Non-STEM		STEM	
Specification	**Full**	**Credit**	**Full**	**Credit**
Panel A: 3rd-Year Academic Outcomes				
Credits Withdrawn	-0.187	0.416*	0.291	-1.143**
	(0.186)	(0.218)	(0.444)	(0.493)
Full-Time Enrollment	-0.067**	-0.280***	-0.118*	-0.149*
	(0.031)	(0.040)	(0.065)	(0.082)
Credits Attempted	-0.870*	-3.458***	-1.274	-0.816
	(0.500)	(0.703)	(1.014)	(1.258)
Attempt 36+ Credits	-0.003	0.019	0.003	0.025
	(0.021)	(0.026)	(0.040)	(0.054)
N	141,150	96,309	40,987	29,577
Panel B: 4th-Year Academic Outcomes				
Credits Withdrawn	-0.106	0.198	-0.044	-0.671
	(0.165)	(0.219)	(0.350)	(0.532)
Full-Time Enrollment	-0.035	-0.195***	-0.031	-0.156*
	(0.032)	(0.042)	(0.068)	(0.086)
Credits Attempted	-0.411	-2.164***	-0.991	-1.903
	(0.573)	(0.700)	(1.145)	(1.407)
Attempt 36+ Credits	0.055***	0.020	-0.004	-0.021
	(0.022)	(0.030)	(0.039)	(0.045)
N	119,792	81,865	38,190	27,584
Credits Passed Range	$\geq$19	[19,29]	$\geq$19	[19,29]
GPA Range	$\geq$ 2.172	>2.828	$\geq$ 2.172	>2.828

Notes: "Credits Withdrawn" is the credit value of total withdraws during the given academic year. 4th-Year academic outcomes are conditional on persisting. *p<0.10; **p<0.05; ***p<0.01.

Table A.13. Effects of TEXAS Grant Loss on Academic Outcomes, By Field of Study — Year 2 Benchmark

	Non-STEM		STEM	
Specification	**Full**	**Credit**	**Full**	**Credit**
Graduate in 4 Years	0.039	-0.066	0.038	0.218**
	(0.0306)	(0.0422)	(0.0542)	(0.0875)
N	141,150	96,309	40,987	29,577
Graduate in 5 Years	-0.020	-0.189***	0.043	-0.152*
	(0.0330)	(0.0446)	(0.0705)	(0.0911)
N	123,994	83,228	35,624	25,272
Graduate in 6 Years	-0.005	-0.175***	-0.035	-0.125
	(0.0327)	(0.0451)	(0.0745)	(0.0802)
Bachelor's Degree	-0.018	-0.135***	-0.107	-0.051
	(0.0301)	(0.0401)	(0.0690)	(0.0686)
N	105,511	70,049	30,020	21,121
Time to Graduate (Months)	-0.168	2.010	-3.270	0.116
	(0.9588)	(1.3585)	(2.3807)	(2.9500)
N	117,999	83,075	34,405	25,892
Credits Passed Range	≥19	[19,29]	≥19	[19,29]
GPA Range	≥ 2.172	>2.828	≥ 2.172	>2.828

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 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 A.14. Effects of TEXAS Grant Loss on Graduation Outcomes, By Field of Study — Year 2 Benchmark

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