HOPE and Zell Miller Scholarships:
Impacts on College Enrollment, Persistence, and Completion

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Abstract

This paper examines whether Georgia's HOPE and Zell Miller Scholarships affect college enrollment, persistence, and degree attainment. I link student-level administrative records from a public school district in the Metro Atlanta area to National Student Clearinghouse data and use GPA thresholds in a regression discontinuity design. HOPE eligibility increases college enrollment, persistence, and in-state degree attainment, with enrollment gains concentrated among low-income students. Zell Miller eligibility shifts students toward Georgia institutions without enrollment gains and raises STEM degree attainment. HOPE generates fiscal returns by increasing human capital among financially constrained students and improving retention of high-achieving students within the state.

Keywords: Merit-Based Scholarship, College Enrollment, Degree Attainment

JEL Codes: I23, I26, J08

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1 Introduction

State financial aid plays a central role in college access, but how to target this aid remains contested. Need-based aid directs resources toward students with greater financial constraints, while merit-based aid ties eligibility to academic performance regardless of students' income background. Although merit aid can increase college enrollment and encourage students to remain in-state (Dynarski, 2002; Cornwell et al., 2006a), critics argue that it may disproportionately subsidize students who would attend college without aid, limiting its benefits for lower-income students. The distributional consequences of merit-based aid remain an important policy question, particularly given evidence that its effects may differ substantially by students' socioeconomic background (Dynarski, 2000; Firoozi, 2022).

Expanding college access, however, does not necessarily translate into college completion. Nearly 30 percent of first-year students do not return for a second year, and 40 percent leave college without earning a degree.[1] Merit aid can also alter students' college choices, potentially affecting the quality and field of study. Eligibility restrictions may encourage students to choose institutions where they can use the scholarship, even when those institutions offer lower-quality opportunities (Cohodes and Goodman, 2014), while GPA-based renewal requirements may discourage students from choosing majors with more demanding coursework (Sjoquist and Winters, 2015). These changes in college choice may ultimately affect degree attainment and the returns to merit-based aid. Evaluating merit-based aid therefore requires examining not only whether it expands college access, but also how it shapes college choice, persistence, and degree completion.

Georgia's HOPE and Zell Miller Scholarships offer an ideal setting for studying merit-based aid. Established in 1993, HOPE (Helping Outstanding Pupils Educationally) covers most of tuition (roughly 78 to 98 percent for students taking 12 credit hours) for students with a 3.0 weighted high school GPA, while the Zell Miller Scholarship, introduced in 2011, targets students with a 3.7 GPA and covers full tuition. Students with a GPA below 3.0 are not eligible for either scholarship, while those between 3.0 and 3.7 remain eligible for HOPE but not Zell. Thus, Zell provides more generous tuition coverage than HOPE, although the Zell premium varies across institutions. The Zell premium can be as large as about $1,050 per semester at some colleges, or roughly $10,500 over a 120-credit degree. Both scholarships can be used only at in-state institutions, with the most generous awards at public colleges and universities. In the absence of a statewide need-based program[2], these two scholarships constitute Georgia's primary sources of state financial aid, placing it among the top providers of grant aid per undergraduate student.[3]

[1] National Student Clearinghouse, Fall 2025. See: National Student Clearinghouse; National Student Clearinghouse Research Center.

[2] Georgia launched its first statewide need-based aid program, the Georgia DREAMS Scholarship, in Fall 2026.

[3] National Association of State Student Grant & Aid Programs Annual Survey, 2020. See:

This paper examines the effects of Georgia's HOPE and Zell Miller Scholarships on high school students' college enrollment, persistence, and degree attainment. The analysis focuses on graduates from one public school district in the Metropolitan Atlanta area between 2012 and 2023. By linking student-level administrative records to National Student Clearinghouse (NSC) college enrollment data, I employ a regression discontinuity (RD) design that exploits the programs' GPA eligibility thresholds: 3.0 for HOPE and 3.7 for Zell. This approach compares students who are nearly identical in both observable and unobservable characteristics, differing only in academic eligibility for the scholarship.

HOPE eligibility increases college enrollment by 2.7 percentage points (3.4 percent) after high school graduation. These intent-to-treat estimates may understate the effects of actually receiving the scholarship. With a first-stage estimate of roughly 67 percent, the corresponding receipt effects could be substantially larger. The enrollment gains come from enrollment in in-state four-year colleges, which increases by 7.5 percentage points (17.1 percent). Concentration in in-state colleges is consistent with prior evidence that aid eligibility shifts students toward institutions targeted by the program (Abraham and Clark, 2006; Kane, 2007). Although HOPE increases overall college enrollment, HOPE-eligible students shift toward less selective institutions. This pattern suggests that students trade college selectivity for available aid, consistent with earlier findings from a merit-aid program in Massachusetts (Goodman, 2008; Cohodes and Goodman, 2014).

Beyond initial enrollment, HOPE eligibility strengthens early persistence and in-state degree attainment. Eligible students are 3.7 percentage points (5.2 percent) more likely to continue to a second semester, though these persistence gains do not extend beyond the first year. This fade-out may reflect HOPE's in-college retention rule, which requires students to maintain a 3.0 college GPA. Roughly 42 percent of HOPE recipients ultimately lose the scholarship during college (Ribar and Rubenstein, 2021). Consistent with this pattern, HOPE has only a modest effect on longer-run outcomes. HOPE does not increase any four-year college degree attainment. The completion gains are concentrated in in-state institutions, where HOPE raises in-state four-year college completion within six years by 3.7 percentage points (28.5 percent).

HOPE enrollment gains come almost entirely from low-income students eligible for free or reduced-price meals during K-12. Among FRPM-eligible students, HOPE eligibility raises enrollment by 6.3 percentage points (9.0 percent). Persistence gains are similarly concentrated among low-income students, who are 7.2 percentage points more likely to persist to the second semester of their freshman year. Despite these enrollment and persistence gains, HOPE still has no detectable effect on overall four-year degree completion among low-income students. For higher-income students, by contrast, HOPE mainly reshapes college choice rather than the extensive

https://www.nassgapsurvey.com/

margin, shifting enrollment away from out-of-state and private colleges toward in-state public colleges. The FRPM-based differences in enrollment and persistence become more pronounced under stricter definitions of low-income status, among students ever eligible for free lunch and among those persistently FRPM-eligible throughout high school, following Michelmore and Dynarski (2017).

The Zell Miller Scholarship produces a different pattern. Rather than expanding access, Zell primarily redirects students toward in-state institutions. Zell-eligible students are 5.6 percentage points (9.2 percent) more likely to enroll in-state, driven by a reduction in out-of-state enrollment. Students who narrowly miss Zell eligibility remain eligible for HOPE, so the enrollment shift reflects the additional aid Zell provides on top of HOPE, rather than the presence or absence of aid itself. Unlike HOPE, however, this reallocation does not come at the cost of college selectivity. Zell-eligible students are more likely to attend in-state colleges, without shifting toward less-selective institutions. This enrollment-shifting pattern is similar across FRPM-eligible and non-eligible students, suggesting that Zell keeps high-achieving students in-state regardless of income background.

Zell does not improve overall persistence or six-year college completion rates, either overall or at in-state four-year institutions. However, Zell shifts degree completion toward STEM fields. Zell-eligible students are 4.1 percentage points (27.3 percent) more likely to graduate with a STEM-designated degree from an in-state four-year college. This shift appears to be driven by students enrolling in colleges with a large Zell premium, where Zell covers substantially more tuition than HOPE. Colleges with large Zell premiums are more STEM-intensive, and students who enroll in them are more likely to graduate with a STEM degree. Thus, Zell retains high-achieving students in-state without sacrificing college selectivity, while shifting degree completion toward STEM fields.

Using the Marginal Value of Public Funds (MVPF) framework (Hendren and Sprung-Keyser, 2020), I estimate that HOPE generates $1.66 in social benefits for every $1 spent, driven primarily by increased in-state degree attainment. Importantly, HOPE generates substantial fiscal benefits for Georgia, but these benefits do not translate into comparably large gains in overall social welfare. The net fiscal return to the state is approximately $6,800 per marginal recipient over a 20-year horizon, exceeding the estimated fiscal returns to access to Georgia's public four-year colleges (Goodman et al., 2017; Smith et al., 2025). From the state's fiscal perspective, HOPE increases college access and in-state degree completion among low-income students, generating a college wage premium and, in turn, higher state income tax revenues. Among higher-income students, HOPE primarily increases the likelihood that students remain in Georgia, expanding the state's tax base through greater in-state labor-market retention. Merit aid can generate substantial fiscal returns for the state through both increased human capital among financially constrained stu-

dents and greater retention of high-achieving students, while producing more limited gains in overall social welfare.

This study contributes to the literature on postsecondary education and merit-based scholarships in three ways. First, I contribute methodologically to the HOPE literature by estimating the programs' impacts on postsecondary outcomes using a regression discontinuity design based on high school graduation records. Earlier studies mainly relied on cross-state comparisons before and after HOPE's introduction, estimating average treatment effects using data from the Current Population Survey (Dynarski, 2000, 2004) or the Integrated Postsecondary Education Data System (Cornwell et al., 2006a). I complement this approach by exploiting the clear GPA cutoff that determines eligibility, following students near the threshold from high school through college enrollment, persistence, and degree completion. The RD design identifies local average treatment effects for individuals who are more responsive to the policy than students far above or below the threshold, providing strong internal validity and complementing the existing cross-state evidence. I also test course-taking behavior around the cutoff to assess the RD design's validity. While prior work on merit aid and high school behavior has largely focused on test-score outcomes such as SAT and ACT scores (Henry and Rubenstein, 2002; Pallais, 2009), as well as GPA, attendance, and on-time graduation (Harris and Mills, 2025), few studies examine course-taking behavior around a specific eligibility threshold. I find no evidence that students strategically alter course selection, including AP, IB, and dual enrollment, or grade retention near the GPA cutoff.

Second, this paper contributes to the literature on the distributional effects of merit-aid programs. The finding that HOPE's positive impacts on enrollment and persistence are concentrated among low-income students suggests that marginal eligibility matters most for students facing tighter financial constraints. Students around the HOPE cutoff are disproportionately higher-income, yet the effects are concentrated among the 40 percent of students who are low-income. This result differs from earlier work suggesting that HOPE was concentrated among higher-income students and may have widened inequality (Dynarski, 2000, 2002, 2004). Prior merit-aid program literature often finds enrollment benefits across income groups (Scott-Clayton, 2011; Zimmerman, 2014; Cohodes and Goodman, 2014), sometimes with larger effects among lower-income students (Zimmerman, 2014; Cohodes and Goodman, 2014). My findings provide direct evidence that a pure merit aid program can reduce enrollment gaps among marginal students even without explicitly targeting low-income groups. The concentrated gains are even more pronounced under stricter definitions of low-income status.

Finally, this paper directly compares the HOPE and Zell Miller Scholarships within a unified RD framework and estimates their social returns, highlighting how specific program design shapes both the effects and the welfare consequences of merit aid. Prior work on Zell has examined how aid loss affects persistence and graduation (Jones et al., 2022) and how reductions

in aid generosity and certainty reshape college choices (Song and Rubenstein, 2024). My paper complements these studies by benchmarking Zell directly against HOPE across a comprehensive set of outcomes, from high school course-taking through college degree attainment and major choice. I show that both scholarships shift students toward in-state colleges, but their longer-term impacts on completion and field of study diverge. HOPE increases in-state four-year degree completion without discouraging STEM major choice, while Zell eligibility raises STEM degree attainment. These differences translate into different welfare consequences for Georgia. HOPE generates positive social benefits. Zell produces no measurable welfare gains through overall degree completion, although its effect on in-state STEM degree attainment implies an MVPF of 2.56.

2 Merit-Aid Programs in Georgia

2.1 HOPE and Zell Miller Scholarship

Georgia operates two statewide merit-based scholarships without need-based aid: the HOPE (Helping Outstanding Pupils Educationally) Scholarship and the Zell Miller Scholarship.[4] Established in 1993 and funded by lottery revenues, HOPE is among the earliest state-sponsored merit-based financial aid programs in the United States (Doyle, 2006), having awarded more than $15 billion to over 2.1 million students through the 2023–24 academic year.[5] The Zell Miller Scholarship was introduced in 2010–11 as a companion program covering full tuition for higher-achieving students. At the same time, HOPE shifted from covering full tuition to paying a fixed dollar amount per credit hour, which became partial coverage.

Both programs are available to Georgia residents who graduate from high school, have resided in Georgia for 12 consecutive months before college enrollment, and enroll in an eligible in-state postsecondary institution. Neither program has an income requirement, making both purely merit-based. Academic eligibility is determined by the High School HOPE GPA. Students qualify for HOPE with a HOPE GPA of at least 3.0, while Zell requires a GPA of at least 3.7 together with a minimum SAT score of 1200 or an ACT score of 26. Students with a GPA below 3.0 are not eligible for either scholarship, while those between 3.0 and 3.7 remain eligible for HOPE but not Zell. The HOPE GPA is a weighted average of core academic course grades computed by the Georgia Student Finance Commission (GSFC); AP, IB, and dual-enrollment grades of B through D receive an additional 0.5 weight. Beginning with the graduating class of 2016, GSFC introduced a rigor requirement (at least three credits of advanced coursework for the class of 2016 and four

[4]Georgia introduced its first statewide need-based scholarship, the DREAMS Scholarship, in Fall 2026. See gafutures.org/dreams.

[5]Georgia Student Finance Commission, 2024.

credits from the class of 2017) to limit GPA inflation from lower-difficulty course-taking; 97.9 percent of graduates in the 2016–2023 cohorts satisfied this requirement. Students can track their HOPE GPA on the GAFutures platform starting in tenth grade. GSFC announces the final HOPE GPA by June 30 following high school graduation. Although GSFC does not announce the final HOPE GPA until high school graduation, students can estimate it during 12th grade using their interim GPA through 11th grade and the official HOPE GPA calculation formula.[6]

The two scholarships cover tuition at eligible in-state colleges but differ in generosity at four-year public institutions. At four-year public institutions in the University System of Georgia (USG), Zell covers each institution's full tuition regardless of credit hours, whereas HOPE pays a fixed dollar amount per credit hour, so its coverage rate varies across institutions, ranging from 78 to 98 percent of tuition. Appendix Figure A1 illustrates HOPE and Zell award amounts across USG institutions for students attempting 6 credit hours (part-time) and 12 credit hours (full-time). For full-time enrollees, the HOPE–Zell gap is relatively small in most colleges. However, at several higher-tuition institutions, including the Georgia Institute of Technology, the University of Georgia, and Georgia College and State University, HOPE covers only about 78 percent of tuition. At these institutions, the Zell premium reaches about $1,050 per semester for a student taking 12 credit hours, or roughly $10,500 over a 120-credit degree. The Zell premium is smallest for students taking 15 credits per semester, as the HOPE award increases with the number of credits attempted (see Appendix Figure A1 and Appendix Figure A2).

At two-year colleges in the Technical College System of Georgia (TCSG) and at the 34 eligible private institutions, HOPE and Zell provide identical flat awards in FY2026, $107 per credit hour at TCSG and $2,985 per semester for full-time students at private institutions.[7] Both scholarships cover tuition only and do not pay mandatory fees or other educational expenses. Appendix Figure A2 shows tuition plus fees by USG institution; fees range from $320 to $818, averaging $550 per semester. In addition, both are first-dollar awards and are not reduced by other financial aid sources.

Eligibility extends for 7 years from high school graduation for the graduating cohort of 2011–2018, and for 10 years from high school graduation for the graduating cohort of 2019 or later. Once students complete the Free Application for Federal Student Aid (FAFSA), they are automatically considered for the scholarship; otherwise, they must submit a one-time online application through the Georgia Student Finance Application (GSFAPP). During college, recipients must maintain a cumulative college GPA of 3.0 for HOPE and 3.3 for Zell to remain eligible. The GSFC evaluates GPA at the 30-, 60-, and 90-credit-hour checkpoints. Students who fall below the Zell threshold but maintain a GPA of at least 3.0 remain eligible for HOPE funding. A full de-

[6]For details on the GAFutures platform, see gafutures.org.

[7]Tuition and fee information for TCSG colleges is available at: https://www.tcsg.edu/parent-page/.

scription of the eligibility criteria, renewal requirements, and institution-specific award amounts is provided in Appendix B.

2.2 Previous Studies

Early evaluations of the HOPE Scholarship focused primarily on college access, using difference-in-differences designs that compared outcomes before and after HOPE's introduction. Dynarski (2000) found that HOPE increased college attendance in Georgia by 6–7 percentage points, or approximately 4–6 percentage points per $1,000 in aid. These findings are broadly consistent with evidence from institution-level data: Cornwell et al. (2006a) documented a 5.9-percentage-point increase in total enrollment. Beyond the decision to attend college, HOPE also affected where students enrolled, shifting Georgia high school graduates toward more selective and in-state institutions (Chakrabarti and Roy, 2013; Cornwell et al., 2006a). These enrollment gains occurred across both two-year and four-year sectors, with particularly large increases at historically Black colleges and universities (HBCUs) and private four-year colleges (Cornwell et al., 2006a). I build on this literature by using a regression discontinuity design that compares students just above and below the eligibility cutoff and follows students from high school through college access and choice. I find that HOPE increases college enrollment, with the largest effects coming from shifts toward in-state public colleges.

As the literature developed, attention shifted from initial college access to degree completion, where the evidence is mixed.[8] Using cross-cohort comparisons, Dynarski (2008) found a 3-percentage-point increase in college completion, particularly among women. In contrast, Sjoquist and Winters (2012) found no effect on degree completion, attributing the limited gains in part to high rates of scholarship loss. A study using administrative data from the University System of Georgia further highlights the importance of maintaining eligibility: persistence and graduation rates decline substantially after students lose their scholarship eligibility (Henry et al., 2004). I revisit these longer-term outcomes among high school graduates and find that HOPE increases early persistence and four-year in-state degree completion within 6 years.

A related literature examines the distributional consequences of merit-based aid. Because HOPE is an academic merit scholarship, earlier studies raised concerns that the program could disproportionately benefit middle- and high-income students and potentially widen socioeconomic and racial gaps in college access (Dynarski, 2000, 2002, 2004). At the same time, other evidence suggests that HOPE can provide meaningful support to low-income students when they also receive need-based aid such as Pell Grants (Singell et al., 2004), and may increase four-year

[8]Beyond these core postsecondary outcomes, prior research has also examined HOPE's effects on local automobile consumption (Cornwell and Mustard, 2007), local housing prices (Campbell and Smith, 2009), institutional pricing (Long, 2004), high school graduation rates (Henry and Rubenstein, 2002), and K–12 funding (Chakrabarti et al., 2018).

college enrollment among Black students (Cornwell et al., 2006a). My findings contribute to the literature on the distributional effects of HOPE by showing that the program generates particularly concentrated enrollment and persistence gains among low-income students, suggesting that HOPE may narrow the socioeconomic gap in college access around the eligibility margin.

Beyond college enrollment and completion, the HOPE literature examines how students respond to the incentives created by maintaining HOPE during college. Because students must maintain a 3.0 GPA to retain the scholarship, they may adjust their academic and enrollment decisions to avoid losing aid. Studies find that students are less likely to choose STEM majors (Dee and Jackson, 1999; Sjoquist and Winters, 2015), less likely to take math and science courses (Cornwell et al., 2006b), and more likely to engage in strategic enrollment behaviors such as withdrawing from courses or reducing credit loads (Cornwell et al., 2005), suggesting that scholarship retention incentives can meaningfully shape students' academic choices throughout college. An exception is Zhang (2011), who finds that HOPE may increase STEM degree attainment among women. I show that HOPE increases four-year in-state degree completion without reducing STEM major choice, while Zell eligibility increases STEM degree attainment.

In contrast to the extensive literature on postsecondary behavioral responses, relatively little is known about how merit aid affects academic behavior in high school. Using an eight-year randomized trial of a merit-based grant program, Harris and Mills (2025) find no effects on GPA, attendance, or on-time high school graduation, despite positive effects on college expectations and low-cost preparatory behaviors. Henry and Rubenstein (2002) find that HOPE scholars had higher GPAs and SAT scores than non-scholars, even though HOPE eligibility is based on GPA alone and does not require an SAT score. This suggests that HOPE improves educational quality rather than grade inflation. Pallais (2009) similarly finds that Tennessee's merit-aid program increased students' ACT scores. Kramer (2016) examines state-level high school course-taking responses to merit-aid programs and finds that students in states with merit-aid programs were more likely to enroll in Advanced Placement courses following program adoption. While these studies document changes in high school academic performance and course-taking at the state level, relatively few examine whether students adjust their course-taking around a specific scholarship eligibility threshold. I address this gap by examining course-taking behavior, including AP, IB, and dual enrollment courses, around the HOPE GPA cutoff at each grade level, and find no evidence of strategic course selection.

The introduction of the Zell Miller Scholarship in the 2010-11 academic year and the reduction in HOPE's tuition coverage have generated a related strand of research on how changes in aid generosity affect student behavior. Jones et al. (2022) exploit differences in partial-aid losses among already-enrolled students and find that reductions in scholarship funding had no measurable effect on persistence, graduation, or borrowing. They argue that wealthier families may

be relatively insensitive to moderate changes in college prices, while less-affluent students can offset reductions in HOPE aid with supplemental need-based aid such as Pell Grants. Song and Rubenstein (2024) use a difference-in-differences design based on Georgia high school graduates to examine how the scholarship restructuring affected college choice. Students eligible for the more generous Zell became approximately two percentage points more likely to enroll in in-state institutions, whereas students eligible only for the reduced HOPE Scholarship became less likely to enroll in-state. I complement this literature by comparing the effects of HOPE and Zell eligibility within a common regression discontinuity framework. The comparison highlights how both aid generosity and eligibility cutoff shape student responses: HOPE's partial tuition coverage and relatively lower GPA threshold substantially increase college attendance among marginal students, whereas Zell's full tuition coverage with high GPA primarily affects in-state college choice and STEM degree attainment.

3 Data

I use student-level administrative records from one large public school district in the metro Atlanta area. The district is one of the top five largest districts in Georgia, comprising 106 schools serving more than 88,000 students in Academic Year 2025–26. High school records are linked to postsecondary enrollment data from the National Student Clearinghouse (NSC). This combination of data sources enables comprehensive tracking of students from secondary schooling through their postsecondary outcomes.

3.1 High School Records

The primary dataset consists of secondary school records providing information on course-taking patterns, academic transcripts, school enrollment histories, and demographic characteristics. These academic records detail specific courses completed, letter and numeric grades, graduation status and date, HOPE scholarship eligibility, and both cumulative and final high school HOPE GPAs. The sample includes high school graduating cohorts from 2012 through 2023, for a total of 69,566 students.

The dataset also includes student demographics such as sex, race/ethnicity, English Learner (EL) status, and disability status. I observe whether a student was eligible for Free or Reduced-Price Meals (FRPM) in each given year. I use ever-eligibility for FRPM as a proxy for socioeconomic disadvantage, capturing students who experienced financial hardship at any point during their K–12 education.[9]

[9]Students in households receiving SNAP or TANF automatically qualify for FRPM, and households with income below 185% of the federal poverty level meet the eligibility criteria. For further details on Georgia's FRPM policies, see: https://gadoe.org/snp/free-reduced-policy/.

The data also identify each student's scholarship eligibility. Academic eligibility for HOPE is based on the school district's official HOPE eligibility designation, which indicates whether a student qualifies and, for those who do not, records the reason for ineligibility (either failure to meet the rigor requirement or failure to meet the HOPE GPA threshold). Zell eligibility also requires a minimum SAT/ACT score, which is not observed in the data, so I define academic eligibility using a HOPE GPA of at least 3.7. Students with a HOPE GPA below 3.7 are definitively ineligible for Zell, whereas some students with a HOPE GPA of at least 3.7 without an SAT/ACT score may be incorrectly classified as eligible. However, this concern is likely small, as 98.92% of USG students from 2013–2019 with a HOPE GPA of at least 3.7 who had ever attained the required SAT/ACT score received the Zell Miller Scholarship (Song and Rubenstein, 2024).

I restrict the analysis sample to high school graduates who resided in Georgia for at least 12 consecutive months before college enrollment, consistent with the residency requirements for both HOPE and Zell. Approximately 98% of graduates satisfy this criterion. I further restrict the sample to students who meet the academic rigor requirements for the 2016–2023 cohorts, so that variation in scholarship eligibility comes solely from the HOPE GPA. Approximately 97.9% of graduates meet this rigor requirement.

3.2 National Student Clearinghouse and Supplemental Data

I link high school records to NSC college enrollment data to track postsecondary trajectories in and out of Georgia. As of 2012, the NSC covers approximately 93% of all U.S. postsecondary enrollments and 95% of Georgia institutions (Dynarski et al., 2015). NSC data provide enrollment dates, institution names, enrollment intensity (full-time, three-quarter-time, half-time, less than half-time), majors for degree completers, and degree attainment timing.

I construct an on-time college enrollment outcome variable, defined as enrollment in any postsecondary institution within 16 months of high school graduation.[10] In the robustness section, I examine alternative definitions of enrollment timing, including enrollment within 6 months, within 12 months, and at any time after high school graduation. In addition, to address the possibility that scholarship eligibility meaningfully affects the timing of high school graduation, I construct an alternative on-time enrollment measure using a predicted graduation date set four years after the ninth-grade enrollment date, and I test high school students' grade-retention behavior near the cutoff.

For college choice, I construct outcome variables indicating whether a student enrolls in a Georgia institution and whether they enroll in a four-year, full-time, or public institution at any time after high school graduation. For students who attend multiple institutions over time, the

[10] This definition aligns with the Georgia Office of Student Achievement's methodology for calculating statewide college enrollment rates.

analysis focuses on the first institution they enroll in after high school graduation.

I measure college persistence as continuous enrollment through the second semester of the first year, the second year, and the third year following high school graduation. Degree attainment is measured as completion of a four-year degree within six years or a two-year degree within three years after high school graduation. The NSC covers enrollment records through July 2024. Hence, I restrict the sample for the four-year degree attainment analysis to the 2012–2018 graduating cohorts and for the two-year degree attainment analysis to the 2012–2021 graduating cohorts. For persistence measures, I analyze second-year persistence for the 2012–2022 cohorts and third-year persistence for the 2012–2021 cohorts.

The analysis further supplements the NSC records with institution-level data from the Integrated Postsecondary Education Data System (IPEDS) and 2009 Barron's college selectivity classifications[11] to examine the effects of the scholarships on college selectivity and tuition levels. Using IPEDS data, I classify colleges into four selectivity tiers based on the 2015 average combined SAT Math and Evidence-Based Reading/Writing scores of enrolled students, using thresholds ranging from 900 to 1200 and above, following Bueno et al. (2024).[12] These SAT thresholds correspond to broad categories of institutional selectivity in Georgia, where most public colleges fall between 900 and 1200 and only a few universities exceed 1200. I also use Barron's college selectivity classifications, defining selective colleges as those rated "Very Competitive Plus" or above (ratings of 1, 2, 3, and 4).[13] To measure the scholarships' impact on sticker tuition, I use annual IPEDS data on in-state and out-of-state tuition and fees to construct annual tuition distributions and indicators for institutions at or above the 25th, 50th, and 75th percentiles, both nationally and within Georgia.

3.3 Summary Statistics

Table 1 presents summary statistics for the high school graduating cohorts from 2012 to 2023, covering baseline characteristics and college outcomes, including institution type, persistence, and degree attainment. In the full student sample (Column 1), 34 percent of students are Black, 40.6 percent are ever eligible for FRPM, and the mean HOPE GPA is 3.05. Compared with the statewide averages reported in Column 2[14], the racial composition of the sample is relatively

[11]Barron's selectivity ratings are available at: https://archive.nytimes.com/www.nytimes.com/interactive/2013/04/04/business/economy/economix-selectivity-table.html

[12]These thresholds correspond to national percentiles: 900 (29th), 1000 (48th), 1100 (69th), and 1200 (81st). See College Board (https://research.collegeboard.org/reports/sat-suite/understanding-scores/sat).

[13]In the study sample, the most commonly attended selective colleges (based on Barron's selectivity classifications) in Georgia are the University of Georgia and the Georgia Institute of Technology. Among out-of-state institutions, the most frequently attended selective colleges are the University of South Carolina at Columbia, the University of Tennessee at Knoxville, Clemson University, and the University of Florida.

[14]Student and school demographic data for Georgia are obtained from the Governor's Office of Student Achievement: https://gosa.georgia.gov/report-card-dashboards-data/report-card/contents-report-card/student-and-school-

similar. In the 2023–24 school year, statewide shares of Black and White students are 40.7 percent and 36.3 percent, respectively. The shares of English Learners and students with disabilities (10.9 and 14.1 percent) are close to the statewide averages (7.6 and 13.2 percent). However, the share of students ever eligible for FRPM in the sample is lower than the statewide average of 67.5 percent. Overall, 79 percent of students enroll in college following high school graduation, exceeding Georgia's statewide college enrollment rate of 64.4 percent. Among students in the full sample, 73 percent persist into their second semester of college, and 32 percent earn a four-year college degree within six years.

Column 3 reports summary statistics for students who are academically eligible for the scholarships, have a HOPE GPA of at least 3.0, and meet the residency requirements. Scholarship-eligible students are more likely to be female, less likely to be Black or Hispanic, and less likely to have ever been eligible for FRPM. Overall, 92 percent enroll in college immediately after high school graduation, and 61.8 percent enroll in colleges in Georgia. They are also more likely than students in the full sample to enroll in selective colleges, persist in college, and complete a four-year college degree within six years. The six-year graduation rate among scholarship-eligible students is 46.5 percent.

Column 4 reports summary statistics for the HOPE regression discontinuity (RD) sample, which includes students with HOPE GPAs near the 3.0 eligibility cutoff. Column 5 reports the corresponding RD sample for the Zell Miller Scholarship, consisting of students with HOPE GPAs near the 3.7 cutoff. Students in the Zell RD sample are higher achieving than students in both the full sample and the HOPE RD sample. They are more likely to be female, Asian, or White, and less likely to be Black or Hispanic. Only 18 percent have ever been eligible for FRPM. Overall, 94 percent enroll in college, and nearly all of them attend four-year institutions. 60 percent enroll in the most selective colleges, where the average SAT score is 1,200 or higher. Their persistence and completion rates are also high: 91.5 percent persist into their second semester of college, and 62.7 percent earn a four-year college degree within six years.

4 Empirical Strategy

Estimating the effects of the HOPE and Zell Miller Scholarships is challenging because scholarship-eligible students differ systematically from ineligible students. For example, high-achieving students are more likely to meet the academic eligibility requirements and enroll in college, potentially reflecting differences in aspirations, motivation, and parental investment.

I use a regression discontinuity design that compares students just below and above the GPA eligibility thresholds (Imbens and Lemieux, 2008). Because students near the cutoff are ex-

demographics.

pected to be similar in observed and unobserved characteristics, the discontinuity in scholarship eligibility isolates the effect of crossing the GPA threshold. The RD design is sharp for HOPE and for Zell with respect to the GPA criterion because students below the relevant GPA cutoff are not academically eligible, while students above the cutoff satisfy the GPA requirement.

4.1 Regression Discontinuity

I estimate the reduced form for HOPE and Zell following the equation:

$$Y_{ist} = \alpha_0 + \alpha_1 Above_{ist} + \alpha_2 D_{ist} + \alpha_3 Above_{ist} \times D_{ist} + \delta X'_{ist} + \eta_{st} + \nu_{ist}, \tag{1}$$

where Y_{ist} is an outcome for student i from high school s in graduating cohort t, including indicators for college enrollment, persistence, and completion. I estimate the equation separately at the HOPE cutoff of 3.0 and the Zell cutoff of 3.7. D_{ist} is the running variable, defined as the student's HOPE GPA minus the relevant cutoff, and $Above_{ist}$ is an indicator equal to one if $D_{ist} \geq 0$. The interaction term $Above_{ist} \times D_{ist}$ allows the linear trend in HOPE GPA to differ on either side of the cutoff. X'_{ist} is a vector of student-level covariates, consisting of sex, race/ethnicity, ever eligibility for free or reduced-price meals, ever English learner status, and ever disability status. η_{st} denotes high school-by-graduating cohort fixed effects, and ν_{ist} is the error term. The coefficient α_1 is the intent-to-treat effect of scholarship eligibility on postsecondary outcomes. I estimate the equation by local linear regression using bandwidths of 0.3 for HOPE and 0.25 for Zell. Both bandwidths come from the optimal bandwidth calculation of Imbens and Kalyanaraman (2012) applied to on-time college enrollment. Standard errors are clustered at the level of the running variable, HOPE GPA, following Lee and Card (2008).

4.2 Validity Checks for RD Design

The RD design assumes that students on either side of the cutoff are comparable and differ only in academic eligibility. I examine covariate balance, including sex, race/ethnicity, ever FRPM eligibility, English learner status, and disability status, at both the HOPE and Zell cutoffs. Table 2 shows no evidence of statistically significant discontinuities in observable characteristics at either the HOPE or Zell cutoff, in both the full sample and subsamples defined by FRPM eligibility. Appendix Figure A3 presents graphical evidence for each demographic characteristic at the HOPE cutoff, and Figure A4 does the same for the Zell cutoff.

For the RD design to be valid, students should not be able to precisely manipulate their running variable around the cutoff. Several institutional features of the HOPE GPA calculation likely limit the scope for such manipulation. The GSFC centrally calculates HOPE GPAs using

official transcripts submitted directly by accredited high schools. GSFC updates students' 9th-, 10th-, and 11th-grade HOPE GPAs each fall, and high schools must submit transcript data by September 1. As a result, students enter senior year with a GSFC-verified interim GPA based on completed core coursework, although the official final HOPE GPA is not issued until graduation. Because the HOPE GPA is a credit-weighted average of four years of core coursework, students could, in principle, use their interim GPA and remaining senior-year coursework to calculate the grades needed to reach the 3.0 threshold using the same formula GSFC uses.

In practice, however, students can only change their cumulative GPA so much during senior spring because most of their core coursework is already complete. For example, consider a student entering senior spring with a 2.95 HOPE GPA. Students take an average of 2.86 core courses during senior spring, accounting for 11 percent of their cumulative core coursework. Thus, with 89 percent of their cumulative core coursework already completed, a student with a 2.95 GPA would need to earn two A's and one B in these remaining courses to reach the 3.0 eligibility threshold. Although students near the cutoff can affect their eligibility through senior-spring grades, the relatively small share of remaining coursework limits how much one or two additional courses can shift the cumulative GPA across the threshold. In the robustness analysis, I examine students' rigor-course taking around the cutoff in each grade to assess whether students systematically alter course-taking in ways that could affect their HOPE GPA at the margin.

Students may also consider staying in high school for one or two additional years to raise their final GPA and become scholarship-eligible, or delaying high school graduation accordingly. Appendix Figure A5 shows the share of students who were ever retained in a grade around the HOPE and Zell cutoffs, plotted against final HOPE GPA. Students who are marginally eligible for HOPE, with final GPAs just above 3.0, are no more likely to have been retained during high school, and I find no statistically significant evidence of retention behavior at either cutoff. I also construct a predicted high school graduation date based on four years after the 9th-grade enrollment date and use this date to construct the on-time college enrollment date. The magnitude and statistical significance of the estimates are similar to those of the main findings (see Appendix Table A1).

A related implication of no manipulation is that the observation density should be smooth around each cutoff. Visual inspection, however, reveals notable heaping at whole- and half-point GPA values, including the HOPE cutoff of 3.0. Panel A of Figure A6 shows bunching at 2.5, 3.0, 3.5, and 4.0, with similar patterns across FRPM and non-FRPM subsamples (Panels C and D). While such heaping could reflect manipulation, it may also arise mechanically from the HOPE GPA's construction: GPAs are computed from discrete letter grades on a four-point scale, with additional weights for advanced coursework, which can result in clustering at .0, .25, and .5 increments. Similar patterns have been documented in prior studies using both high school GPA (Bettinger et

al., 2019; Bhargava et al., 2025) and college GPA (Barreca et al., 2016; Ost et al., 2018; Schudde and Scott-Clayton, 2016; Scott-Clayton and Schudde, 2020). By contrast, the GPA 3.7 cutoff for Zell, which uses the same HOPE GPA measure, shows continuity without any heaping, as presented in Appendix Figure A7.

To assess whether this heaping is mechanical rather than a sign of manipulation, Appendix Figure A8 Panel A presents a simulated GPA distribution based on randomly assigned grades, following Ost et al. (2018). The simulated data reproduce similar bunching at whole-number GPAs, including the scholarship cutoff, suggesting that the heaping largely reflects the mechanical construction of the GPA measure rather than strategic behavior. If heaping is primarily mechanical, the running variable should appear smooth once I remove exact mass points. Following Scott-Clayton and Schudde (2020), I examine the density after excluding observations at the cutoff. Appendix Figure A8 Panel B shows that while the full sample exhibits bunching, the restricted sample excluding GPA = 3.0 (Panel C) displays no statistically significant discontinuity (p-value = 0.514), consistent with continuity of the running variable.

Nevertheless, heaping at the eligibility threshold warrants additional consideration. I therefore implement a donut RD design excluding students with a HOPE GPA exactly equal to 3.0 (Barreca et al., 2016; Schudde and Scott-Clayton, 2016; Ost et al., 2018). I also estimate specifications that incorporate "trends-in-heaps," controlling for indicators of heaped GPA values and their interactions with a quadratic function of distance from the cutoff, following Zimmerman (2014); Barreca et al. (2016). The robustness section presents results from these alternative specifications to assess whether the observed lumpiness reflects mechanical GPA construction or potential manipulation.

5 Results

5.1 HOPE Scholarship on College Enrollment

HOPE-eligible students are 2.7 percentage points more likely to enroll in college after high school graduation, a 3.4 percent increase relative to the control mean (Table 3, Column 1). Because the RD estimates the effect of HOPE eligibility rather than scholarship receipt, the effects are intent-to-treat estimates and may understate the effect of actually receiving the scholarship. Given the first-stage estimate of roughly 67 percent, the corresponding effects of scholarship receipt could be larger than the intent-to-treat estimates. Panel A of Figure 1 shows a positive jump at the 3.0 GPA threshold for on-time college enrollment. This estimate is smaller than earlier evaluations: Dynarski (2000) reports a 6-7 percentage point increase, and Cornwell et al. (2006a) report a 5.9 percentage point increase. Both estimate average treatment effects using students far from the eligibility threshold, whereas this paper estimates an intent-to-treat effect local to

the margin. Students are more comparable around the cutoff, which likely explains the smaller magnitude.

The positive enrollment effect is robust to alternative timing windows (6, 12, and 16 months, as well as any time after graduation) and to heteroskedasticity-robust standard errors (Appendix Table A2). Estimates remain similar in magnitude and statistical significance when excluding observations at the GPA cutoff using a donut RD, excluding demographic controls, and using a triangular kernel. The Trends in Heaps specification yields similar results, mitigating concerns that heaping at the cutoff biases the estimates (Appendix Table A7). The estimates are also stable across alternative bandwidth choices and placebo cutoffs, with the largest discontinuity occurring at the true HOPE eligibility threshold (Appendix Figure A15 and Appendix Figure A19).

HOPE shifts students toward in-state and public institutions, where the grant is most generous. In-state enrollment rises 6.4 percentage points, and public enrollment rises 3.8 percentage points (Columns 2 and 4 of Table 3). Correspondingly, out-of-state enrollment falls 4.1 percentage points and private enrollment falls 1.4 percentage points (Columns 3 and 5). Effects are even larger for in-state four-year and in-state public four-year enrollment (Columns 6–7), where HOPE covers most of tuition, consistent with Cornwell et al. (2006a)'s finding of a 9 percent increase in in-state four-year enrollment using statewide institution-level comparisons. Positive effects on in-state public colleges are consistent with prior evidence that aid eligibility shifts students toward program-targeted institutions (Abraham and Clark, 2006; Kane, 2007). Panels B and C of Figure 1 show the corresponding discontinuities.

HOPE-eligible students are also 3.4 percentage points more likely to enroll in four-year colleges, a 5 percent increase relative to the control mean (Column 8). Point estimates for two-year enrollment are negative but not statistically significant (Column 9), providing limited evidence of two-year to four-year substitution. This is plausibly because HOPE covers in-state two-year colleges with up to full tuition, leaving little incentive to switch to four-year colleges. This finding contrasts with Dynarski (2000), who finds stronger substitution toward four-year institutions. Full-time enrollment rises modestly by 2.8 percentage points (Table A3, Column 1), likely because HOPE also covers part-time enrollees in proportion to attempted credit hours.

These full-sample effects mask substantial income heterogeneity. Enrollment gains concentrate among low-income students, proxied by ever-eligibility for FRPM. HOPE increases college enrollment by 6.3 percentage points among FRPM-eligible students (Panel B of Table 3, Column 1), while non-FRPM students show no significant response (Panel C). Panel D of Figure 1 confirms that FRPM-eligible students drive the enrollment discontinuity, even though non-FRPM students have higher enrollment rates overall regardless of eligibility. Although fewer low-income students meet the GPA cutoff, this pattern suggests they are especially responsive to the scholarship when deciding whether to enroll. The positive enrollment gains concentrated among low-income

students contradict earlier findings by Dynarski (2000, 2002, 2004), who raised concerns that HOPE benefits middle- and high-income students most.

The in-state enrollment effect appears for both income subgroups (7.6 percentage points for FRPM-eligible students and 5.5 percentage points for non-FRPM students; Panels B and C of Column 2), but the underlying mechanism differs. For non-FRPM students, eligibility mainly induces substitution: they are 5.1 percentage points less likely to enroll out of state and shift instead toward in-state colleges, and the similar magnitudes of the in-state increase and out-of-state decrease suggest that HOPE primarily keeps high-income students in Georgia rather than inducing new enrollment. For FRPM-eligible students, by contrast, eligibility appears more likely to induce enrollment at in-state or public colleges among students who would not otherwise have enrolled. Panels E and F of Figure 1 show a strong response among both FRPM-eligible and non-FRPM students. Both groups also show positive gains in in-state four-year college enrollment (Columns 6 and 7), with larger effects among FRPM-eligible students.

The positive gains in four-year college enrollment are concentrated among low-income students, at 5.7 percentage points (10.1 percent), with no substitution effect among high-income students (Column 8). Full-time enrollment gains are similarly concentrated among low-income students, at 4.6 percentage points (Table A3, Column 1). When low-income students enroll in college through HOPE, they do so full-time and at four-year colleges. Appendix Figure A9 shows a small positive jump only among FRPM-eligible students, for both full-time and four-year college enrollment. Prior merit-aid literature typically finds enrollment gains spread across income groups, or larger gains among lower-income students (Scott-Clayton, 2011; Zimmerman, 2014; Cohodes and Goodman, 2014). HOPE's concentrated benefit for low-income students provides direct evidence that merit aid can narrow enrollment gaps among marginal students even without explicitly targeting low-income groups.

5.2 HOPE Scholarship on College Choice by Selectivity

Beyond raising overall enrollment and shifting students toward in-state and public institutions, HOPE also affects the selectivity of the colleges students choose. HOPE-eligible students are less likely to attend selective institutions overall. Columns 1–3 of Table 4 show enrollment increases of 3.3, 3.2, and 3.6 percentage points at less- and mid-tier selective colleges, where average SAT scores are above 900, 1000, and 1100, respectively. However, enrollment at highly selective institutions (average SAT above 1200) declines by 3.3 percentage points (34 percent). This negative enrollment in highly selective institutions is consistent with Barron's selectivity rating. HOPE-eligible students are 1.6 percentage points (39 percent) less likely to enroll in a selective college, defined as institutions ranked "Very Competitive Plus" or higher (Column 5, Table 4). This pattern suggests that marginally eligible students sort into relatively less selective

but more affordable institutions in response to HOPE, consistent with a trade-off between college quality and cost under merit aid programs (Goodman, 2008; Cohodes and Goodman, 2014). HOPE lowers the cost of college and appears to shift students away from higher-cost, highly selective institutions. Georgia's relatively small number of the most selective institutions may further constrain these choices. Panel A of Figure 2 shows the increase in enrollment at SAT 1000+ institutions at the margin, while Panels B and C show the corresponding decline at SAT 1200+ and selective colleges.

This aggregate decline in selective enrollment is concentrated among high-income students. Non-FRPM students are 5.5 percentage points (37.6 percent) less likely to enroll in colleges with average SAT scores above 1200, and 2.7 percentage points (39 percent) less likely to enroll in a selective college under the Barron's rating (Columns 4 and 5, Panel C of Table 4). Panels E and F of Figure 2 show a modest decline among high-income students at selective colleges, with no detectable effect among low-income students. RD figures for college choice by selectivity at the 900+ and 1100+ thresholds are presented in Appendix Figure A10.

Disaggregating by college location shows that non-FRPM students reduce enrollment in highly selective colleges both in and out of state, rather than substituting out-of-state selective colleges with in-state ones.[15] As shown in Appendix Table A4, non-FRPM students shift from out-of-state selective institutions toward in-state colleges in the moderate selectivity tier (SAT 900–1100), while enrollment in the most selective tiers declines overall. Specifically, these students are 1.7 percentage points less likely to attend in-state colleges with SAT scores of 1200 or above, and 4 percentage points less likely to attend out-of-state colleges at that same selectivity level. This pattern indicates that HOPE does not mainly work by shifting students across state lines into top-tier institutions. Instead, HOPE shifts enrollment toward moderately selective but more affordable colleges.

5.3 HOPE Scholarship on College Persistence and Completion

The HOPE Scholarship increases early college persistence. Panel A, Column 1 of Table 5 shows that marginally eligible students are 3.7 percentage points (5.2 percent) more likely to remain enrolled in the second semester after high school graduation. Panel A of Figure 3 shows a clear increase at the eligibility cutoff in second-semester persistence. However, this gain does not last. Second-year persistence is positive but not statistically significant in the full sample (Column 2 in Table 5), and the gains fade by the third year (Column 3). This limited duration likely

[15]University of Georgia (selectivity tier "highly competitive") and Georgia Institute of Technology (selectivity tier "highly competitive plus") are the most frequently attended in-state selective colleges, while University of South Carolina at Columbia (selectivity tier "very competitive plus"), University of Tennessee–Knoxville (selectivity tier "very competitive plus"), and Clemson University (selectivity tier "highly competitive") are the most frequently attended out-of-state selective colleges.

reflects the scholarship's renewal requirements. Initial eligibility depends on high school GPA, but students must then maintain a 3.0 college GPA after the first year to retain the scholarship. Students at the HOPE margin are not the highest-achieving. Some may therefore lose or regain the scholarship while in college. In the late 1990s, about 56 percent of first-year students lost the scholarship in their second year (Dee and Jackson, 1999). About 42 percent lost it before attempting 90 credit hours during 2013–2019 (Ribar and Rubenstein, 2021).

Early persistence gains are concentrated among low-income students. FRPM-eligible students show a 7.2-percentage-point (12 percent) increase in second-semester persistence and a positive and statistically significant second-year gain of 5.0 percentage points. The gain fades by the third year even within the FRPM-eligible group. Panels D and E of Figure 3 confirm that FRPM-eligible students drive the positive impacts across these outcomes. Together, these results suggest that HOPE improves early college retention, particularly among low-income students.

HOPE eligibility does not increase four-year college completion within six years of high school graduation. Eligible students are positively, but not significantly, more likely to earn a degree from any four-year college within six years (Column 4 of Table 5). This small and insignificant effect contrasts with the finding reported in Dynarski (2008), which uses a cross-cohort comparison and reports a 3-percentage-point increase (11 percent). Consistent with the shift toward in-state enrollment, the effect on in-state four-year degree attainment is positive. Eligible students are 3.7 percentage points (28.5 percent) more likely to graduate from an in-state four-year college (Column 5) and 3.6 percentage points (30.8 percent) more likely to graduate from an in-state public four-year college (Column 6). HOPE's award is most generous at in-state public four-year colleges, so the large enrollment gains at these institutions translate into higher completion rates.

Despite the strong enrollment and persistence gains for FRPM-eligible students, HOPE still has no detectable effect on overall four-year degree completion among low-income students (Column 4 in Table 5). One possible explanation is that some low-income students face additional college costs not covered by HOPE, which may delay degree completion. Nevertheless, the positive effect on in-state four-year completion holds for both FRPM-eligible and non-FRPM-eligible students (Columns 5 and 6 in Table 5). Together, these results suggest that HOPE increases in-state enrollment and in-state four-year completion for students across income groups.

Time-to-degree patterns are similar between all four-year colleges and in-state four-year institutions. Appendix Figure A11 presents graduation rates within 4, 5, 6, and 7 or more years for both groups. In-state students show a slightly larger increase in completion between six and more than seven years compared to students at any four-year college. This suggests that in-state students are more likely to experience delays in completing their degrees. Nevertheless, Appendix Figure A12 shows that the estimated effects of the scholarship on degree attainment

are stable across time horizons.

HOPE's effect on two-year college completion runs in the opposite direction from its effect on four-year completion. In the full sample, HOPE eligibility is associated with a modest reduction in two-year college completion within three years of high school graduation of approximately 0.8 percentage points (Column 1 in Table A5). Among low-income students, this negative effect is somewhat larger at 1.2 percentage points. These estimates warrant careful interpretation. Marginally eligible students do not appear to shift enrollment from two-year to four-year institutions. They also do not tend to transfer between sectors after initial college enrollment. One plausible mechanism is a sorting process between the four-year and two-year sectors. Students with relatively higher academic preparation, ability, or college aspirations who might otherwise have enrolled in two-year colleges are instead encouraged by HOPE to enroll in four-year institutions. The pool of students remaining in two-year colleges may therefore be, on average, less strongly oriented toward degree completion. This could mechanically lower observed completion rates.[16]

5.4 Zell Miller Scholarship on College Enrollment

Unlike HOPE, Zell eligibility does not increase overall college enrollment. Instead, it shifts where eligible students enroll. Column 1 of Table 6 shows that Zell eligibility has no detectable effect on college enrollment. The control mean at the Zell cutoff is 93.3 percent, indicating that students near this threshold are already highly likely to enroll in college regardless of Zell. Moreover, students just below the Zell cutoff are already HOPE-eligible, and because the grant difference between HOPE and Zell is modest for full-time students, the marginal increase in aid is unlikely to be large enough to induce additional enrollment. Panel A of Figure 4 supports this interpretation, showing that enrollment rates are already high near the cutoff, with only a small jump at the threshold.

Zell instead shifts students toward in-state and public institutions. Columns 2 and 3 of Table 6 show that Zell eligibility increases in-state enrollment by 5.6 percentage points (9.2 percent) and reduces out-of-state enrollment by 5.1 percentage points. A similar pattern holds by institution type: public enrollment rises by 3.2 percentage points (4.1 percent), while private enrollment falls by 2.6 percentage points. High-achieving students substitute toward in-state public options in response to the modestly larger Zell grant. Panels B and C of Figure 4 show clear jumps at the Zell cutoff for both outcomes. Figure 5 further shows that enrollment shifts toward in-state institutions at both the HOPE and Zell cutoffs.

[16] This interpretation is inferential. The data do not allow this study to directly observe the academic characteristics or aspirations of students sorting across sectors, and other explanations cannot be fully ruled out. HOPE Scholarship eligibility could also cause two-year college enrollees to drop out at higher rates than those who marginally missed the scholarship.

This switching does not extend to four-year or full-time enrollment. Column 8 of Table 6 shows no impact of Zell eligibility on four-year college enrollment. Students do not appear to substitute from two-year to four-year institutions, plausibly because HOPE and Zell provide a similar grant amount at two-year colleges, leaving no differential financial incentive to make this shift. Appendix Table A3, Column 3, likewise shows no effect on full-time enrollment. Corresponding RD figures for full-time and four-year enrollment at the Zell cutoff appear in Figure A13.

The shift toward in-state public options is evident across income groups. Columns 2 and 4 of Table 6 show that both low- and high-income students increase their in-state public enrollment. Panels E and F of Figure 4 visually confirm that both groups show a positive jump at the Zell cutoff. Together, these results suggest that Zell's primary effect is to shift high-achieving students toward in-state public institutions rather than to increase overall college enrollment, with a similar pattern across income levels despite the modest Zell grant premium over HOPE at four-year colleges.

5.5 Zell Miller Scholarship on College Choice by Selectivity

Zell does not harm students' choice of selective colleges. Columns 1–3 of Table 7 show that Zell has small to modest positive effects on enrollment in more selective institutions, with no statistically significant impact on the most selective colleges (Columns 4 and 5). Zell-eligible students are 1.8 percentage points more likely to enroll in colleges with average SAT scores above 1100 (Column 3), although the estimate is imprecise. Unlike HOPE, which shifts students away from the most selective institutions, Zell eligibility does not induce a comparable substitution away from top-tier colleges. Because students near the Zell cutoff are high-achieving, many who narrowly miss eligibility still enroll in selective colleges: 84 percent of students in the control group attend institutions with SAT scores above 1100, and 49 percent attend those with SAT scores above 1200 (Columns 3 and 4). Panels B and C of Figure 6 confirm this pattern graphically, and the effect is not detectable for either FRPM-eligible or non-FRPM-eligible students separately (Panels E and F). RD figures for college choice by selectivity at the 900+ and 1100+ thresholds are presented in Appendix Figure A14.

5.6 Zell Miller Scholarship on College Persistence and Completion

Zell-eligible students experience modest increases in second-semester persistence (1.6 percentage points, Column 1 in Table 8), but the effect does not last. Unlike students near the HOPE cutoff, those near the Zell cutoff already exhibit high baseline persistence rates, making them less responsive to marginal increases in aid generosity. Figure 7 Panel A shows a modest positive jump at the cutoff for second-semester persistence, while Panel B shows no clear discontinuity

for second-year persistence at the cutoff.

Zell eligibility does not appear to improve six-year college completion rates, either overall or within in-state four-year institutions. The effect on any four-year college completion within six years is negative, though not statistically significant (Column 4 of Table 8). Figure 7 Panel C shows a corresponding negative jump at the cutoff. This negative effect is more pronounced among high-income students, as Panel F shows a negative discontinuity among non-FRPM students. Zell also does not help students graduate from in-state institutions: even though Zell leads both low- and high-income students to enroll in in-state colleges, its effect on in-state four-year college completion within six years is null (Column 5 in Table 8).

This null pattern contrasts with what we observe at the HOPE cutoff. Figure 8 shows the discontinuity in graduation rates from in-state and out-of-state colleges within 6 years post-high school, separately for each cutoff. At the HOPE cutoff (3.0), there is a clear positive discontinuity in graduation rates from in-state colleges, alongside a negative discontinuity in graduation rates from out-of-state colleges; because the reduction is smaller than the increase, the net effect on overall four-year completion is positive but not statistically significant. At the Zell cutoff (3.7), by contrast, neither in-state nor out-of-state college completion shows a distinctive pattern.

Although Zell does not raise the overall four-year graduation rate among eligible students, it does increase in-state STEM completion. Table 9 shows that Zell-eligible students are 4.1 percentage points (27.3 percent) more likely to graduate with a STEM-designated major from an in-state four-year college within six years. This effect appears to operate through a shift in college choice. Zell-eligible students tend to enroll at large Zell premium colleges, which HOPE does not fully cover (about 78 percent) but Zell does. The largest enrollment gap between Zell-eligible and ineligible students is at Georgia Institute of Technology, where the HOPE-Zell grant premium is among the largest.[17] This shift toward more STEM-intensive colleges helps explain the increase in STEM degree completion among Zell-eligible students.

The Zell-induced shift toward STEM degrees contrasts with HOPE's effects on STEM degree completion. HOPE increases in-state college completion without reducing STEM attainment, despite earlier concerns that HOPE may discourage STEM field choice (Sjoquist and Winters, 2015). Thus, HOPE raises in-state degree completion without discouraging entry into high-demand fields, while Zell leaves overall completion unchanged but shifts the composition of degrees toward STEM fields.

[17] Appendix Table A6 shows the most frequent college choice for Zell-eligible and ineligible students around the Zell cutoff.

5.7 Robustness & Placebo Test

I conduct additional analyses to assess the robustness of the HOPE and Zell Miller Scholarship's findings across alternative specifications. First, I re-estimate the regressions, excluding observations at the exact cutoff, using a donut RD design to address potential concerns about GPA heaping at the cutoff, following Barreca et al. (2011, 2016). I also examine trends around the threshold using the "Trends in Heaps" approach for the HOPE cutoff, following Barreca et al. (2016) and Zimmerman (2014). This specification includes indicator variables for heaped GPA values. It interacts these indicators with a quadratic function of the distance from the cutoff as controls, allowing for level differences at heaped points and flexibly different slopes near the threshold.

Relative to the main estimates, the donut RD and Trends in Heaps specifications yield point estimates that are similar in magnitude or slightly larger, while maintaining the same level of statistical significance. Appendix Table A7 and Appendix Table A8 report the donut and Trends in Heaps results for the full sample, as well as for FRPM and non-FRPM subsamples, across all college enrollment outcomes. The corresponding results for persistence and completion outcomes are presented in Appendix Table A9 and Appendix Table A10.

I also report specifications excluding student demographic covariates and estimates using a triangular kernel, which weights observations near the cutoff more heavily. Both the specification without demographic controls and the triangular kernel approach yield estimates that are similar in magnitude and statistical significance to the main findings for the full sample and the FRPM-eligible and non-eligible subsamples. These estimates appear in Appendix Table A7 and Appendix Table A8 for college enrollment outcomes and Appendix Table A9 and Appendix Table A10 for college persistence and completion outcomes.

Next, I examine the results' sensitivity to alternative bandwidth choices. Specifically, I re-estimate the models using both narrower and wider bandwidths relative to the optimal bandwidth of 0.3 for HOPE and 0.25 for Zell, for both local linear and quadratic specifications. Appendix Figure A15 shows the college enrollment results for HOPE, and Appendix Figure A16 shows the results for Zell. In both figures, the estimates and their confidence intervals stay similar across different bandwidth choices, close to what we find using the optimal bandwidth. Quadratic specifications tend to yield wider confidence intervals than local linear regressions, particularly with wider bandwidths. Nonetheless, the point estimates remain generally consistent with the main results. The robustness figures for bandwidth selection for college persistence and completion are reported in Appendix Figure A17 for HOPE and in Appendix Figure A18 for Zell.

For the placebo test, I assess whether the observed discontinuities are specific to the true scholarship cutoff rather than reflecting arbitrary thresholds in the GPA distribution. To do so, I conduct a random-cutoff exercise by estimating the model at 0.05-GPA increments between 2.6

and 3.4, while holding the bandwidth constant across specifications. The largest and statistically significant discontinuities appear at the true cutoff, whereas estimates at placebo cutoffs are generally smaller and statistically insignificant (Appendix Figure A19 and Appendix Figure A20 for HOPE, and Appendix Figure A21 and Appendix Figure A22 for Zell). While this exercise cannot fully rule out all alternative explanations, the pattern of results is consistent with the interpretation that the policy-relevant threshold drives the main findings.

Finally, I examine whether students near the eligibility cutoff adjust their course-taking behavior in ways that could mechanically inflate their HOPE GPA.[18] For each grade (10th, 11th, and 12th), Table 10 reports whether students ever take AP, IB, or Dual Enrollment courses, the number of AP, IB, Dual Enrollment, and other rigor-qualifying courses taken by marginal eligibility status, and an indicator for ever taking any AP, IB, or Dual Enrollment course in high school.

I find no statistically significant differences in course-taking patterns across grades for the main RD sample, at either the HOPE or Zell cutoff. The only positive estimate is for Dual Enrollment among Zell-eligible students: Zell-eligible students are 3 percentage points more likely to have taken a Dual Enrollment course at some point in high school, suggesting increased college preparation, though the estimate is not statistically significant (Column 8 of Table 10). This evidence cannot definitively rule out strategic behavior, but the absence of detectable changes in course selection suggests limited systematic adjustment in response to the HOPE GPA threshold.

5.8 Heterogeneity and Additional Analysis

I examine heterogeneity across more detailed income categories with the HOPE and Zell Miller Scholarship's main findings that college enrollment, choice, and persistence outcomes differ substantially by student income subgroup. I classify ever-FRPM-eligible students into two groups following Michelmore and Dynarski (2017): (1) those persistently eligible for FRPM during all four years of high school[19], and (2) those eligible only for free meals (not reduced-price meals).[20] Columns 2–4 of Table 11 compare these low-income subgroups for HOPE. Students who are persistently eligible for FRPM during high school (Column 3) show patterns similar to those ever eligible for FRPM (Column 2). Students who qualify specifically for free meals, however,

[18] Ideally, one could use 10th- or 11th-grade intermediate HOPE GPA as the running variable and examine postsecondary outcomes to assess whether effects persist before senior year, since persistent effects would more directly suggest limited scope for last-minute GPA manipulation. However, estimates based on intermediate GPA measures are imprecise and noisy, so I examine course-taking behavior instead, as a suggestive, though indirect, test.

[19] The data track students' FRPM eligibility from kindergarten through high school, but only 9 percent of students are persistently eligible for all observable enrollment spans. Due to limited statistical power, I focus on persistent eligibility during high school (32% among all sample), which is the period closest to college enrollment decisions.

[20] Students who are ever eligible for free meals have household incomes at or below 130% of the federal poverty level (FPL). In contrast, those eligible for reduced-price meals have household incomes between 130% and 185% of the FPL. For example, for a household of four, the annual income threshold is $41,795 or below for free-meal eligibility and $59,478 or below for reduced-price meal eligibility in academic year 2025-26.

experience larger impacts across most college enrollment and persistence outcomes (Column 4). They are 6.6 percentage points more likely to enroll when HOPE-eligible. A parallel pattern emerges for Zell. Persistently FRPM-eligible and free-meal-only students are also more likely to enroll in in-state public institutions, with higher full-time enrollment (Appendix Table A11). Together, students experiencing deeper poverty respond more strongly to scholarship eligibility in their college decisions, for both HOPE and Zell.

The high school-level poverty also matters. Columns 5-7 of Table 11 for HOPE and Appendix Table A11 for Zell present subgroup regressions by school-level poverty, dividing high schools into three groups (high-, medium-, and low-poverty) based on their FRPM shares. The scholarship's enrollment effects are concentrated among students attending the highest-poverty high schools, where eligibility increases enrollment by 8.7 percentage points. The positive impacts are generally consistent across other college enrollment and persistence outcomes. Using these alternative subgroup definitions, the overall results consistently support the main finding that low-income students benefit most from the scholarship. Zell outcomes by FRPM subgroup measure are presented in Appendix Table A11.

Appendix Figure A23 presents heterogeneous effects by demographic characteristics for HOPE (Panel A) and Zell (Panel B). The heatmap (red indicating positive effects, blue indicating negative effects) summarizes impacts across college outcomes on the vertical axis for different student subgroups on the horizontal axis. HOPE-eligible female students appear more responsive to the scholarship than male students, with larger gains in overall enrollment, in-state enrollment, persistence, and four-year graduation within six years. Black students experience a positive and statistically significant 3.6 percentage-point increase in on-time enrollment, while the estimate for Hispanic students is positive (5.4 percentage points) but not statistically significant. For in-state enrollment (second row of Figure A23), nearly all demographic groups show a strong increase in the likelihood of enrolling in Georgia colleges in response to HOPE eligibility; White students, by contrast, show no measurable effects on overall enrollment, persistence, or graduation at the HOPE cutoff, though they are still 6.5 percentage points more likely to enroll in in-state institutions.

HOPE-eligible Black students and students with disabilities are more likely to remain enrolled in the second semester after high school graduation. Given that these groups have historically had lower rates of college enrollment and completion, this pattern may suggest that HOPE eligibility contributes to early persistence among historically underserved groups. For college completion, female and Hispanic students experience the largest effects, with four-year degree attainment increasing by 3.1 and 8.1 percentage points, respectively, consistent with the positive gains among female students documented in Dynarski (2008). Overall, the heterogeneity analysis suggests that groups with historically lower levels of college enrollment and persistence,

particularly Black and Hispanic students, derive meaningful benefits from scholarship eligibility.

Finally, I estimate college choice by institution sticker tuition and fees to understand whether students are more likely to choose more expensive colleges. I classify tuition bands for two sets of institutions: (1) all in-state and out-of-state institutions combined, using quantiles above the 25th, 50th, and 75th percentiles, and (2) in-state institutions only, using the same quantile thresholds. Eligible students are less likely to enroll in more expensive colleges, with enrollment rates 4.6 and 3.5 percentage points lower at institutions with tuition above the 50th and 75th percentiles, respectively. These results are consistent with the fact that eligible students are more likely to enroll in in-state institutions, where sticker tuition is substantially lower than out-of-state tuition. Analysis by tuition band shows that HOPE-eligible students are 7.1 percentage points more likely than ineligible students to enroll in in-state institutions with tuition above the 25th percentile. However, the effect is not distinguishable for the most expensive institutions (those above the 50th and 75th percentile). The results are reported in Appendix Table A12 for HOPE and in Appendix Table A13 for Zell.

6 Welfare Analysis

I conduct a welfare analysis using the Marginal Value of Public Funds (MVPF), following Hendren and Sprung-Keyser (2020), to evaluate the efficiency of the HOPE and Zell Miller Scholarships for social welfare in Georgia. The MVPF is defined as the ratio of a marginal student's willingness to pay (WTP) for a college degree to the net cost of providing the scholarship.

For marginal students, I measure willingness to pay (WTP) as the increase in after-tax lifetime earnings attributable to the scholarship-induced increase in college attainment. Using reduced-form effects on four-year college completion and the estimated college wage premium in Georgia from ACS, following Bartik et al. (2016), I calculate the present value of additional after-tax earnings at a 3% discount rate. This yields an estimated WTP of $22,226 per recipient for in-state four-year degree attainment and $10,812 for any four-year degree attainment under the HOPE Scholarship. For the Zell Miller Scholarship, the corresponding WTP is $35,545 for in-state STEM degree attainment. These estimates exclude non-pecuniary returns to education and assume that the estimated wage premium applies to students near the scholarship eligibility thresholds.

The net cost of the program accounts for direct scholarship expenditures and additional public spending associated with increased college enrollment, while subtracting increased future state tax revenues and behavioral response costs. The resulting net cost per recipient is $13,391 for in-state four-year degree attainment and $13,213 for any four-year degree attainment under HOPE, and $13,910 for Zell. Dividing WTP by net cost yields an MVPF of 1.66 for in-state four-

year degree attainment and 0.82 for any four-year degree attainment for HOPE, and 2.56 for Zell based on in-state STEM degree attainment. Thus, for marginal students near the eligibility cutoff, each dollar of HOPE spending generates approximately $1.66 in social benefits through increased in-state four-year degree attainment. This estimate is lower than the MVPF of 4.0 reported by Hendren and Sprung-Keyser (2020), which relies on earlier enrollment estimates from Cornwell et al. (2006a).

The MVPF captures the broader social return to HOPE, while I separately estimate Georgia's fiscal return following Smith et al. (2025). State-level benefits are measured as the present value of additional Georgia state income tax revenues generated by increased degree attainment at in-state four-year institutions, while costs include both direct and indirect program expenditures. Assuming that graduates remain in Georgia and face the 4.99 percent state income tax rate, the state recovers its net costs approximately 15 years after initial enrollment. If graduates move to other states after completing college, state tax revenues would be lower and the time required to recover the program's costs would be longer. Over a 20-year horizon, HOPE generates an estimated net present value of approximately $6,800 per participant for the state, increasing to roughly $21,300 over a 30-year horizon. HOPE increases college access and in-state degree completion among low-income students, generating a college wage premium and ultimately contributing to larger state income tax revenues. Among higher-income students, HOPE primarily increases the likelihood that students remain in Georgia, expanding the state's tax base through greater in-state labor-market retention. The estimated fiscal benefits exceed those reported in earlier evaluations of returns to public four-year universities in Georgia, which estimated 20- and 30-year returns of approximately $6,000 and $9,000, respectively (Smith et al., 2025). This gap likely reflects differences in the underlying degree attainment effect. Goodman et al. (2017) estimated a degree attainment effect of 0.9 percentage points, compared to the 3.7 percentage point HOPE-induced attainment effect estimated in this paper. These estimates highlight a tension inherent in state merit-aid programs. HOPE generates substantial fiscal benefits for Georgia, but these benefits do not translate into comparably large gains in overall social welfare. The program's fiscal return reflects both increased human capital among financially constrained students and greater in-state labor-market retention among higher-income students, while the broader social return is more limited. The detailed assumptions and calculations are reported in Appendix D.

7 Discussion and Conclusion

This paper shows that Georgia's HOPE Scholarship expands college access and promotes student success, while the Zell Miller Scholarship helps retain high-achieving students in-state and supports their pursuit of STEM degrees. The positive enrollment effects indicate that these

programs not only reduce college costs but also shape enrollment decisions and strengthen Georgia's higher education system. By retaining high-achieving students, HOPE contributes to long-term economic gains through a more educated in-state workforce (Sjoquist and Winters, 2014). Broad, predictable merit aid of this kind can shape college-going decisions and promote in-state enrollment, generating positive returns for Georgia on its scholarship investment. HOPE increases in-state college completion without discouraging entry into high-demand fields, generating substantial social and fiscal returns while supporting students' educational attainment and Georgia's long-run economic growth.

The positive enrollment effects are especially pronounced for low-income students. Although HOPE is merit-based, its first-dollar design effectively removes tuition barriers for financially constrained students, particularly when combined with Pell Grants (Singell et al., 2004). As a result, the scholarship substantially increases college entry, early persistence, and in-state degree attainment among historically underserved populations. However, the more limited impacts on longer-term persistence suggest that financial aid alone may not sustain student progress through college. Complementary supports, such as advising and mentoring, may therefore be necessary to maximize student success and program effectiveness.

While this study provides a granular analysis of merit-based scholarship effects in Metro Atlanta, two limitations warrant consideration. First, the sample comes from a relatively urban setting with higher median household incomes and stronger baseline college-going patterns than the Georgia state average, and greater geographic and institutional access to colleges than may be available in rural areas. Second, the RD design identifies local effects for students near the GPA eligibility thresholds, providing strong internal validity but limiting the generalizability of the estimates to students farther from the cutoffs or in different socioeconomic and geographic contexts.

Nonetheless, the robust positive gains among low-income students in this sample suggest the scholarship's benefits may be even more pronounced when scaled to more economically disadvantaged regions across the state. Despite these differences, the findings provide a critical benchmark for understanding how the state can optimize merit-based aid to support diverse student populations, with important implications for how policymakers design and expand such programs going forward.

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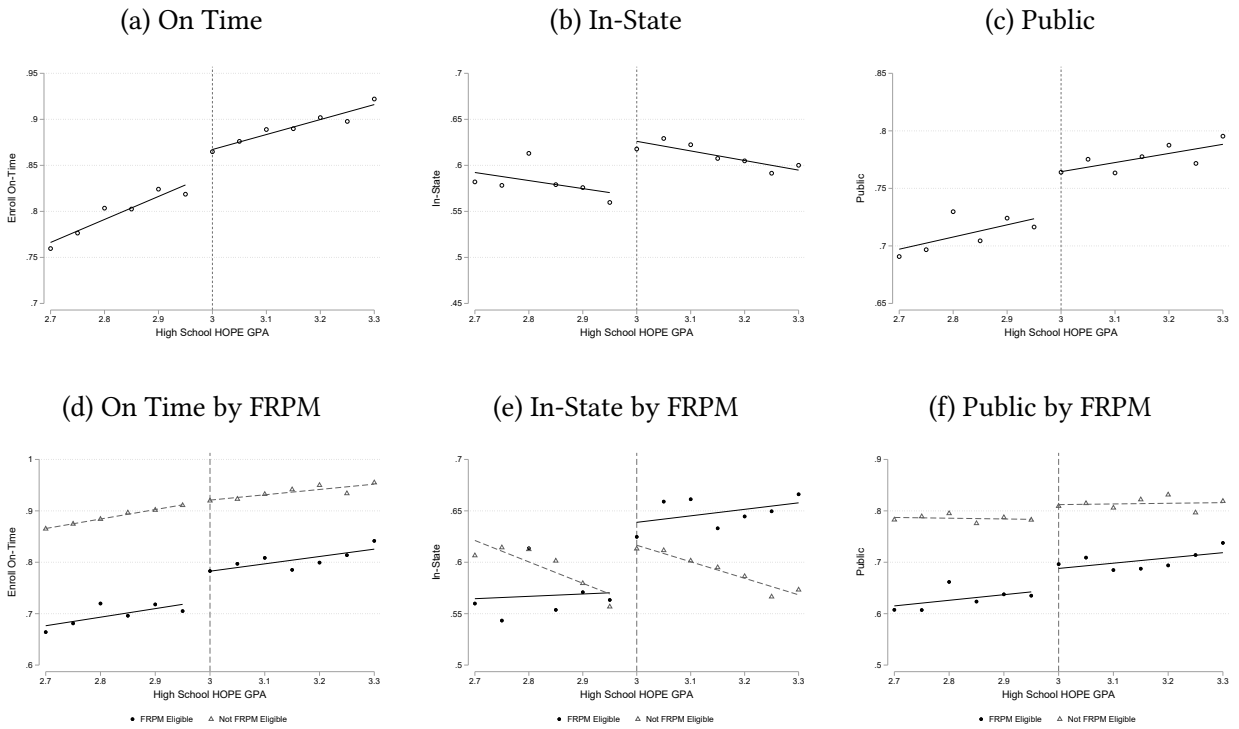
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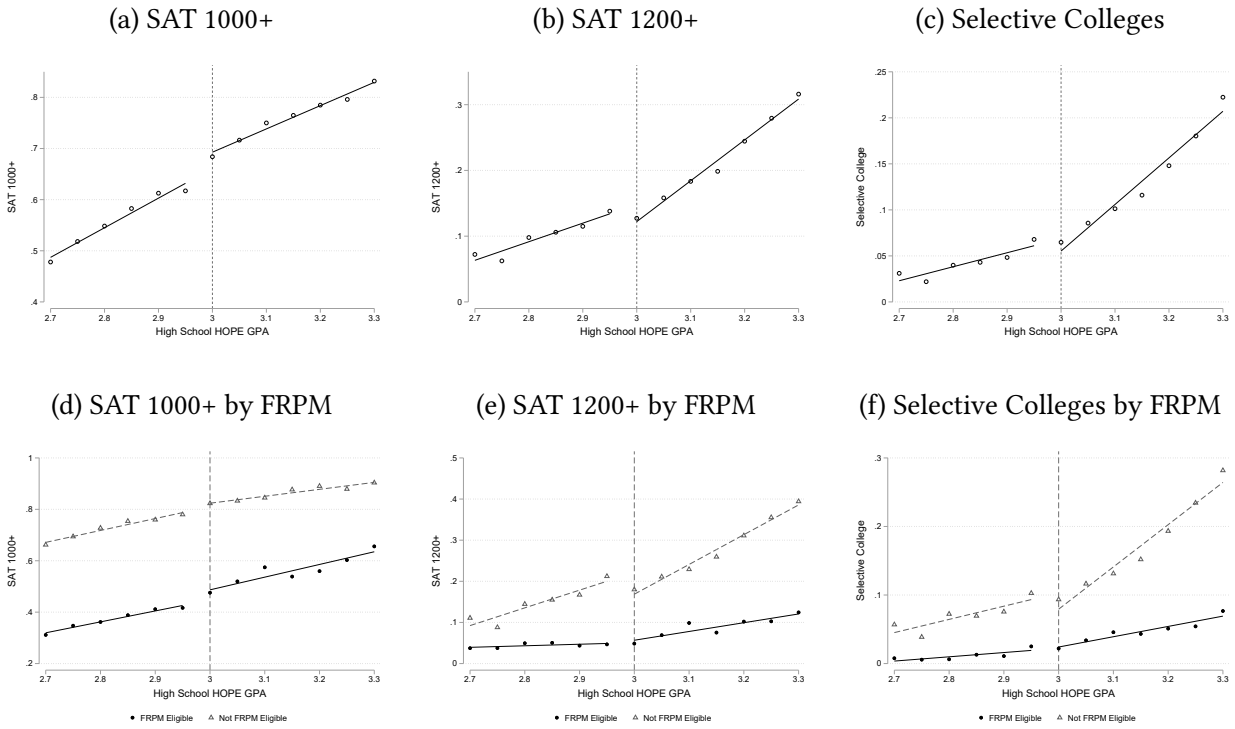
Figures

Figure 1: The Impacts of HOPE Scholarship on College Enrollment by Ever-FRPM Status



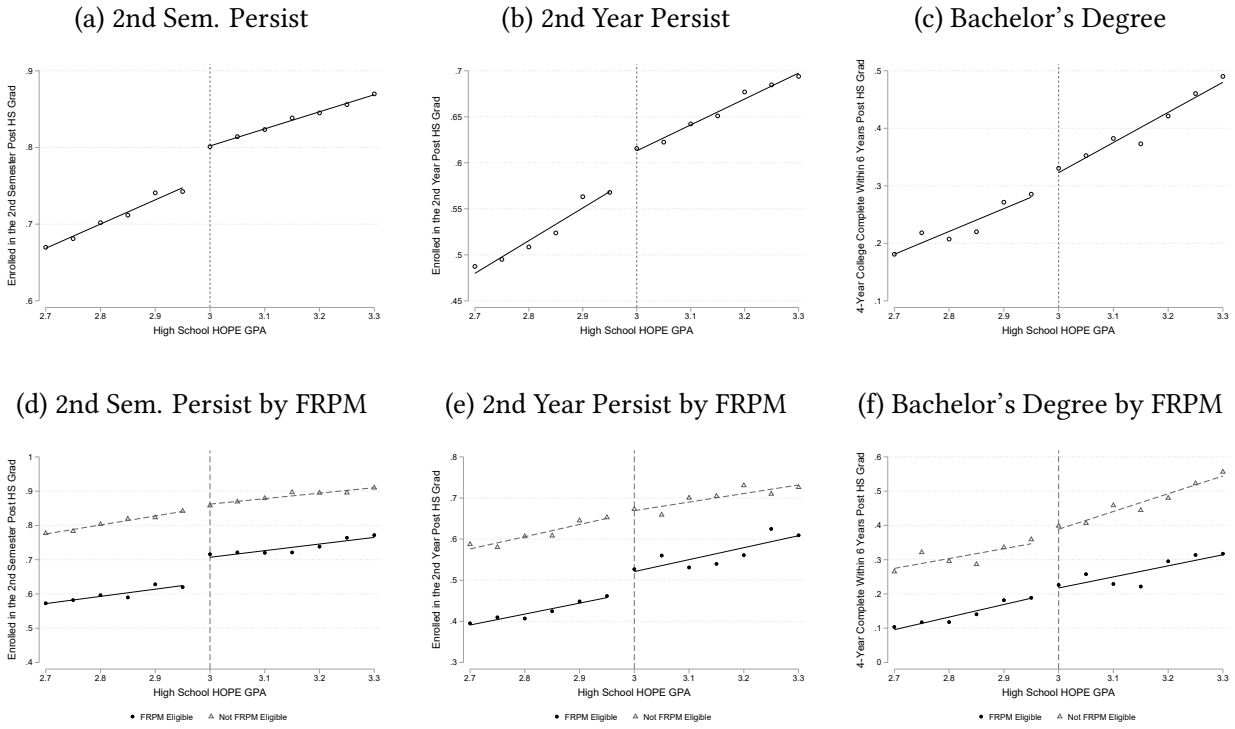
Source: National Student Clearinghouse.
Note: Each figure displays the regression discontinuity for college enrollment outcomes by full student sample (Panel A-C), and by ever-FRPM eligibility (Panel D-F). "FRPM Eligible" indicates students who were ever eligible for free or reduced-price meals during K12 enrollment, while "Not FRPM Eligible" indicates students who were never eligible. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. The bandwidth is set to the optimal calculation of 0.3 based on the on-time college enrollment outcome variable.

Figure 2: The Impacts of HOPE Scholarship on College Choice by Selectivity and by Ever-FRPM Status



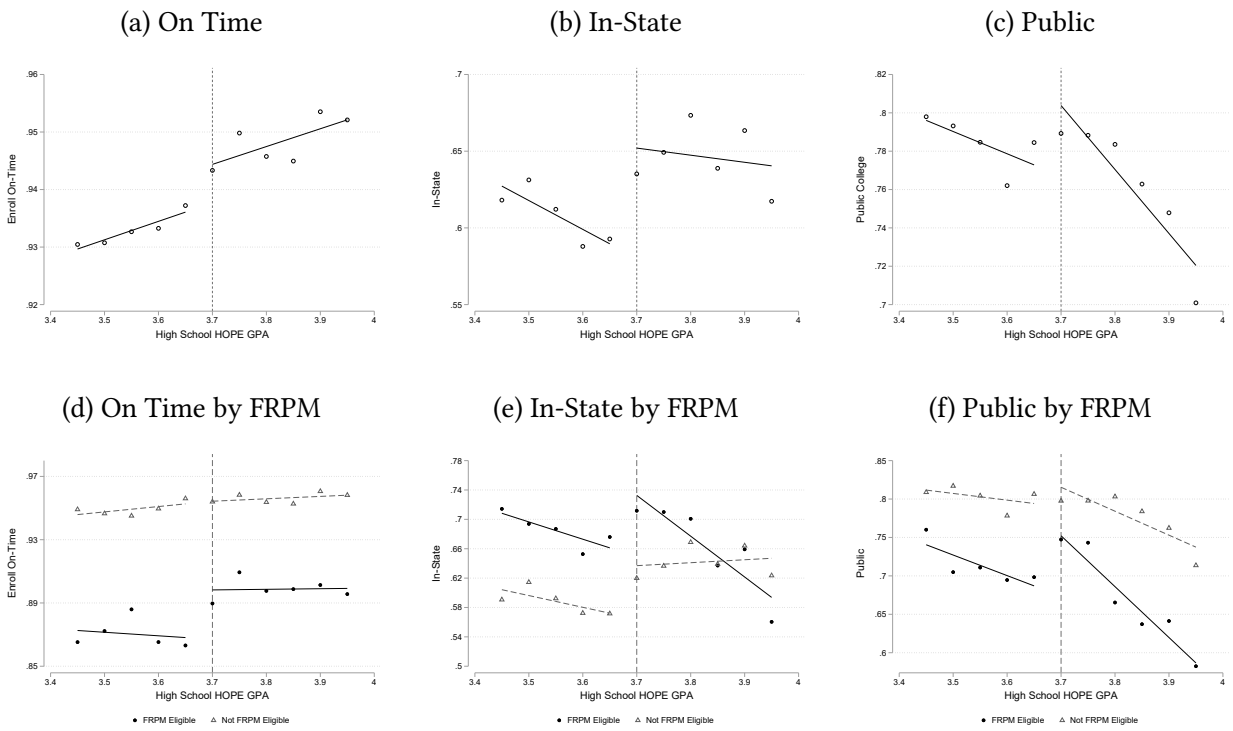
Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.
Note: Each figure displays the regression discontinuity for college choice by selectivity outcomes in the full student sample (Panel A-C) and by ever-FRPM eligibility (Panel D-F). "FRPM Eligible" indicates students who were ever eligible for free or reduced-price meals during K12 enrollment, while "Not FRPM Eligible" indicates students who were never eligible. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. Selective colleges indicate colleges ranking at or above "Very Competitive Plus" under the 2009 Barron's selectivity rating. The bandwidth is set to the optimal calculation of 0.3 based on the on-time college enrollment outcome variable.

Figure 3: The Impacts of HOPE Scholarship on College Persistence and Completion by Ever-FRPM Status



Source: National Student Clearinghouse.
Note: Each figure shows the regression discontinuity for college persistence and completion outcomes by the full student sample (Panel A-C) and by ever-FRPM eligibility (Panel D-F). "FRPM Eligible" indicates students who were ever eligible for free or reduced-price meals during K12 enrollment, while "Not FRPM Eligible" indicates students who were never eligible. The sample includes high school graduates who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. The bandwidth is set to the optimal calculation of 0.3 based on the on-time college enrollment outcome variable.

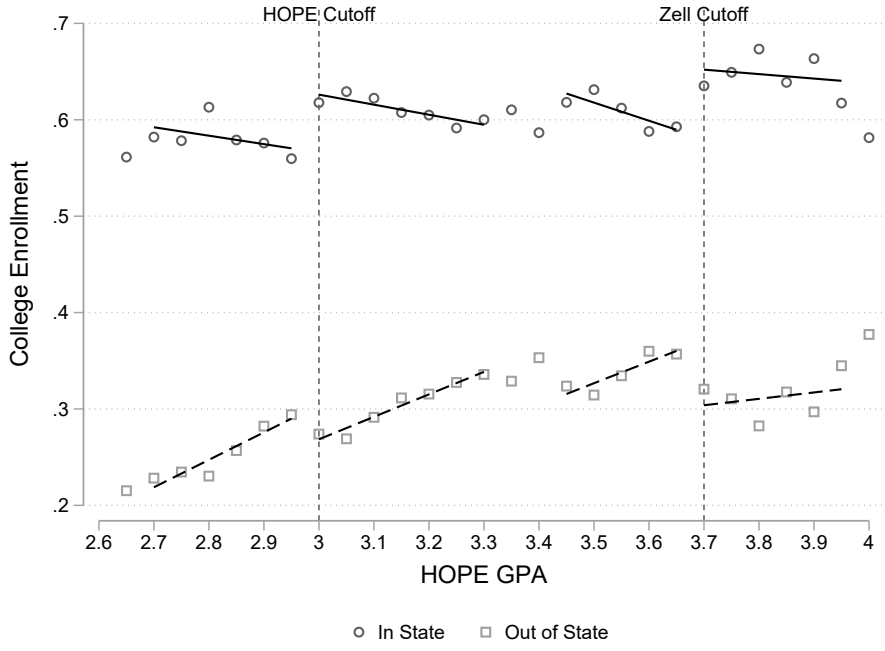
Figure 4: The Impacts of Zell Miller Scholarship on College Enrollment by Ever-FRPM Status



Source: National Student Clearinghouse.

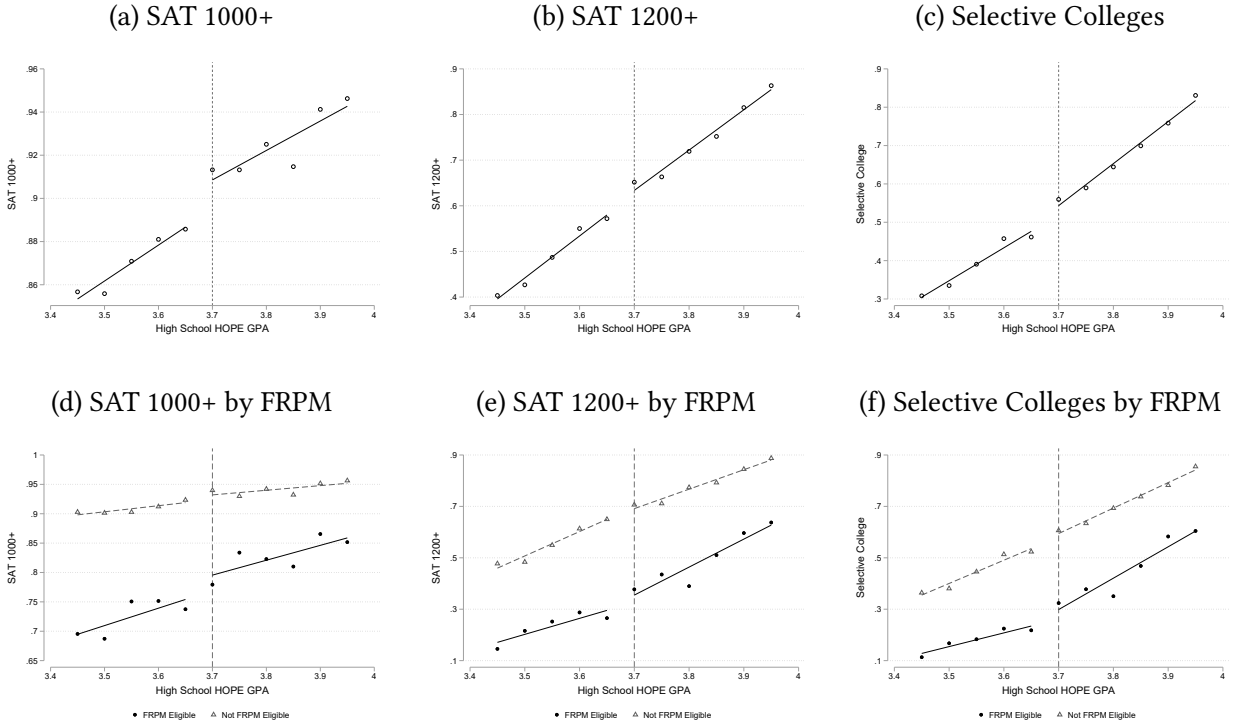
Note: Each figure displays the regression discontinuity for college enrollment outcomes by full student sample (Panel A-C), and by ever-FRPM eligibility (Panel D-F). "FRPM Eligible" indicates students who were ever eligible for free or reduced-price meals during K12 enrollment, while "Not FRPM Eligible" indicates students who were never eligible. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. The bandwidth is set to the optimal calculation of 0.25 based on the on-time college enrollment outcome variable.

Figure 5: In-State and Out-of-State Enrollment Patterns at the HOPE and Zell Miller Scholarship Eligibility Cutoffs



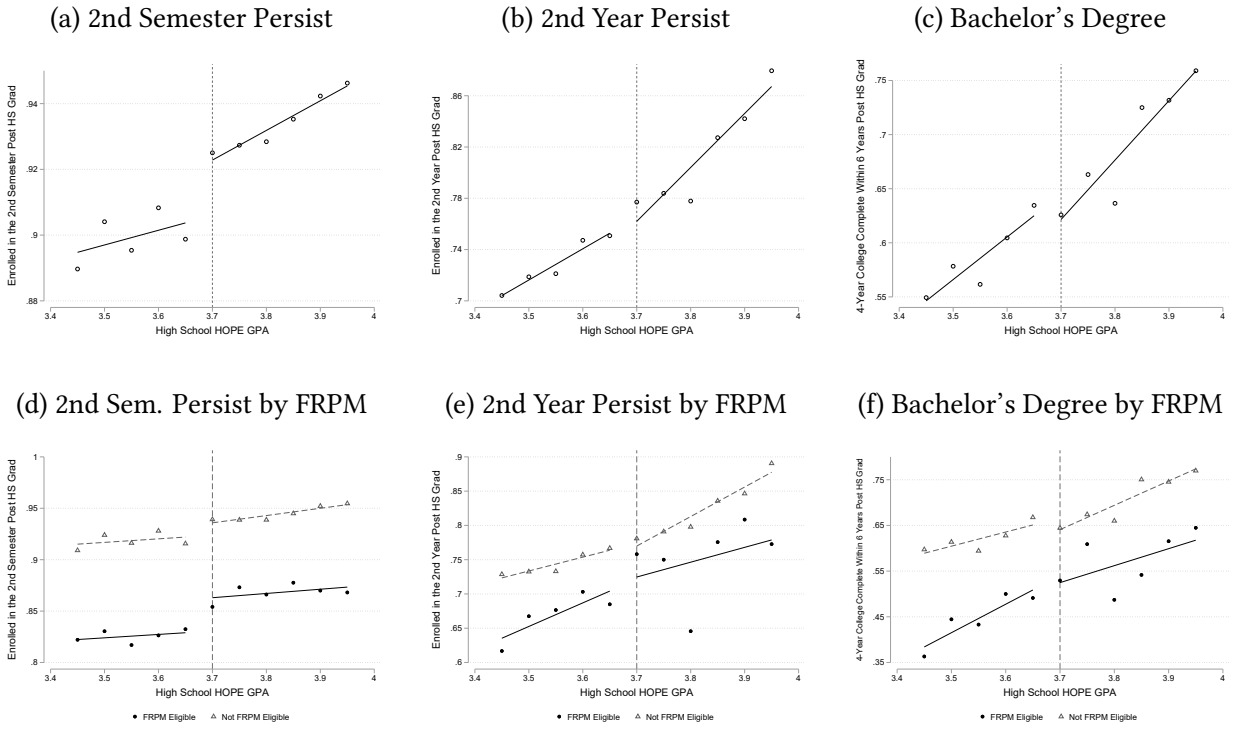
Source: National Student Clearinghouse.
Note: The figure presents the share of high school graduates who enroll at in-state and out-of-state colleges at the HOPE eligibility cutoff (3.0) and the Zell Miller eligibility cutoff (3.7). The sample includes high school graduates from the 2012–2023 cohorts who lived in Georgia for at least 12 consecutive months and met the academic rigor requirements.

Figure 6: The Impacts of Zell Miller Scholarship on College Choice by Selectivity and by Ever-FRPM Status



Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.
Note: Each figure shows the main regression discontinuity for college choice by selectivity outcomes in the full student sample (Panel A-C) and by ever-FRPM eligibility (Panel D-F). "FRPM Eligible" indicates students who were ever eligible for free or reduced-price meals during K12 enrollment, while "Not FRPM Eligible" indicates students who were never eligible. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. Selective colleges indicate colleges ranking at or above "Very Competitive Plus" under the 2009 Barron's selectivity rating. The bandwidth is set to the optimal calculation of 0.25 based on the on-time college enrollment outcome variable.

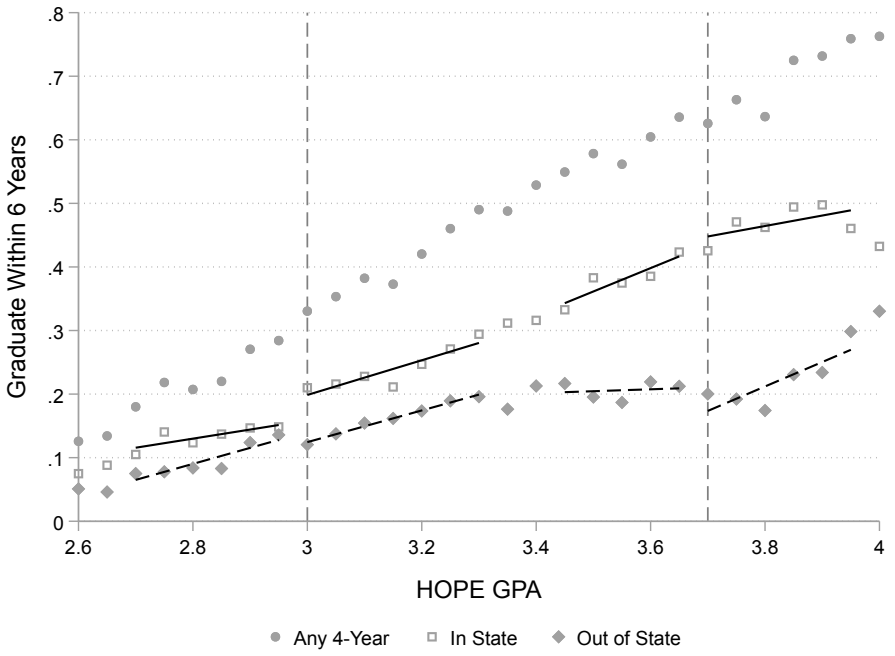
Figure 7: The Impacts of Zell Miller Scholarship on College Persistence and Completion by Ever-FRPM Status



Source: National Student Clearinghouse.

Note: Each figure shows the main regression discontinuity for college persistence and completion outcomes by the full student sample (Panel A-C) and by ever-FRPM eligibility (Panel D-F). "FRPM Eligible" indicates students who were ever eligible for free or reduced-price meals during K12 enrollment, while "Not FRPM Eligible" indicates students who were never eligible. The sample includes high school graduates who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. The bandwidth is set to the optimal calculation of 0.25 based on the on-time college enrollment outcome variable.

Figure 8: HOPE and Zell Miller Scholarships Impact on College Completion Within 6 Years



Source: National Student Clearinghouse.
Note: The figure presents the graduation rate within six years for students from any four-year, in-state four-year, and out-of-state four-year colleges at HOPE cutoff (3.0) and Zell cutoff (3.7). The sample includes high school graduates from the 2012-2018 cohorts who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements.

Tables

Table 1: Summary Statistics of High School Graduating Cohort 2012 - 2023

	Full Sample		State-Wide	Scholarship Eligible		HOPE RD		Zell RD	
	Mean	SD	Mean	Mean	SD	Mean	SD	Mean	SD
Baseline Characteristics									
Female	0.521	0.500	0.493	0.576	0.494	0.526	0.499	0.602	0.489
Asian	0.128	0.334	0.048	0.193	0.394	0.090	0.287	0.242	0.428
Black	0.342	0.475	0.407	0.199	0.399	0.356	0.479	0.137	0.344
Hispanic	0.116	0.320	0.172	0.085	0.279	0.114	0.318	0.075	0.264
White	0.405	0.491	0.363	0.514	0.500	0.429	0.495	0.538	0.499
Free/Reduced-Price Meal	0.406	0.491	0.675	0.238	0.426	0.404	0.491	0.179	0.383
English Learner	0.109	0.312	0.076	0.087	0.282	0.107	0.309	0.084	0.278
Student with Disability	0.141	0.348	0.132	0.104	0.306	0.134	0.340	0.093	0.290
High School HOPE GPA	3.052	0.606		3.499	0.298	3.015	0.173	3.697	0.145
College Enrollment									
Enroll On-Time College	0.790	0.407	0.644	0.921	0.269	0.847	0.360	0.940	0.237
Enroll In-State College	0.564	0.496		0.618	0.486	0.598	0.490	0.631	0.483
Enroll Four-Year College	0.715	0.452		0.893	0.309	0.771	0.420	0.924	0.266
Enroll Full-Time College	0.701	0.458		0.866	0.341	0.749	0.434	0.898	0.302
Enroll Public College	0.687	0.464		0.771	0.420	0.745	0.436	0.780	0.415
College Choice by Selectivity									
Enroll Avg SAT 900+	0.656	0.475		0.864	0.343	0.714	0.452	0.905	0.294
Enroll Avg SAT 1000+	0.617	0.486		0.844	0.363	0.665	0.472	0.895	0.306
Enroll Avg SAT 1100+	0.572	0.495		0.811	0.392	0.601	0.490	0.876	0.330
Enroll Avg SAT 1200+	0.278	0.448		0.457	0.498	0.154	0.361	0.602	0.489
Enroll Selective College	0.218	0.413		0.375	0.484	0.083	0.276	0.519	0.500
College Persistence and Completion									
Persist Second Semester	0.726	0.446		0.885	0.319	0.776	0.417	0.915	0.278
Persist Second Year	0.562	0.496		0.726	0.446	0.593	0.491	0.764	0.425
Persist Third Year	0.467	0.499		0.626	0.484	0.460	0.498	0.682	0.466
Four-Year Graduate Within 6	0.316	0.465		0.465	0.499	0.314	0.464	0.627	0.484
Two-Year Graduate Within 3	0.013	0.115		0.009	0.092	0.015	0.123	0.006	0.080
N	69,566			38,791		21,681		18,009	

Source: Governor's Office of Education and Workforce Strategy, National Student Clearinghouse, and Integrated Postsecondary Education Data System.

Note: The full sample includes high school graduates from the 2012–2023 cohorts. Scholarship-eligible students meet the GPA threshold ($\geq$ 3.0), reside in Georgia for at least 12 consecutive months prior to enrollment, and meet the academic rigor requirements. HOPE RD and Zell RD samples are estimated within bandwidths of 0.30 and 0.25 around the 3.0 and 3.7 GPA cutoffs, respectively; bandwidths are optimized for on-time college enrollment.

Table 2: Covariate Balance Test for Regression Discontinuity Design

	Female	Asian	Black	Hispanic	White	FRPM Eligible	Student With Disability	English Learners
HOPE Cutoff Full Sample								
GPA $\geq$ 3.0	-0.023	0.003	-0.001	-0.011	0.009	-0.018	-0.001	-0.009
	(0.015)	(0.010)	(0.009)	(0.008)	(0.011)	(0.012)	(0.011)	(0.007)
$\bar{Y}$	0.513	0.071	0.412	0.128	0.378	0.476	0.149	0.119
N	21,678	21,678	21,678	21,678	21,678	21,678	21,678	21,678
FRPM Students								
GPA $\geq$ 3.0	-0.011	0.009	0.025	-0.020	-0.014		-0.009	-0.008
	(0.021)	(0.007)	(0.018)	(0.015)	(0.012)		(0.013)	(0.016)
$\bar{Y}$	0.591	0.037	0.655	0.204	0.098		0.124	0.187
N	8,748	8,748	8,748	8,748	8,748		8,748	8,748
Non-FRPM Students								
GPA $\geq$ 3.0	-0.024	0.001	-0.009	0.001	0.012		0.003	-0.003
	(0.020)	(0.015)	(0.010)	(0.007)	(0.017)		(0.015)	(0.008)
$\bar{Y}$	0.442	0.102	0.190	0.059	0.633		0.173	0.056
N	12,927	12,927	12,927	12,927	12,927		12,927	12,927
Zell Miller Cutoff Full Sample								
GPA $\geq$ 3.7	-0.009	-0.001	0.006	0.001	0.002	-0.009	-0.000	0.004
	(0.015)	(0.013)	(0.008)	(0.008)	(0.014)	(0.009)	(0.008)	(0.008)
$\bar{Y}$	0.599	0.197	0.168	0.083	0.541	0.208	0.101	0.088
N	18,009	18,009	18,009	18,009	18,009	18,009	18,009	18,009
FRPM Students								
GPA $\geq$ 3.7	-0.013	0.008	-0.005	0.001	0.014		-0.009	0.003
	(0.034)	(0.024)	(0.028)	(0.026)	(0.027)		(0.016)	(0.031)
$\bar{Y}$	0.692	0.120	0.496	0.206	0.172		0.069	0.221
N	3,216	3,216	3,216	3,216	3,216		3,216	3,216
Non-FRPM Students								
GPA $\geq$ 3.7	-0.006	-0.007	0.011	0.004	-0.004		0.002	0.006
	(0.017)	(0.014)	(0.008)	(0.007)	(0.016)		(0.009)	(0.008)
$\bar{Y}$	0.576	0.217	0.082	0.051	0.638		0.109	0.052
N	14,783	14,783	14,783	14,783	14,783		14,783	14,783

Note: The sample includes high school graduates from the 2012-2023 cohorts who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. The control mean is reported as $\bar{Y}$ below the coefficients. The regression discontinuity bandwidth is set to the optimal calculations of 0.3 for HOPE and 0.25 for the Zell Miller cutoff, based on the on-time college enrollment outcome variable. Standard errors are clustered at the HOPE GPA level presented in the parentheses.

Table 3: Impacts of HOPE Scholarship on College Enrollment by Ever-FRPM Status

		Georgia		Sector		In-State 4-Year		Type	
	(1) Any	(2) In	(3) Out	(4) Public	(5) Private	(6) Any	(7) Public	(8) 4-Year	(9) 2-Year
Panel A. All Students									
GPA $\geq$ 3.0	0.027**	0.064***	-0.041**	0.038***	-0.014*	0.075***	0.073***	0.034***	-0.010
	(0.011)	(0.014)	(0.013)	(0.012)	(0.008)	(0.014)	(0.014)	(0.014)	(0.008)
$\bar{Y}$	0.798	0.582	0.254	0.711	0.125	0.439	0.400	0.680	0.151
N	21,678	21,678	21,678	21,678	21,678	21,678	21,678	21,678	21,678
Panel B. FRPM Students									
GPA $\geq$ 3.0	0.063***	0.076***	-0.029	0.052***	-0.003	0.085***	0.076***	0.057***	-0.008
	(0.018)	(0.024)	(0.018)	(0.018)	(0.015)	(0.023)	(0.021)	(0.019)	(0.014)
$\bar{Y}$	0.697	0.567	0.183	0.628	0.122	0.392	0.353	0.563	0.182
N	8,748	8,748	8,748	8,748	8,748	8,748	8,748	8,748	8,748
Panel C. Non-FRPM Students									
GPA $\geq$ 3.0	0.000	0.055***	-0.051**	0.028**	-0.024**	0.070***	0.072***	0.015	-0.011
	(0.011)	(0.017)	(0.018)	(0.013)	(0.011)	(0.017)	(0.017)	(0.017)	(0.012)
$\bar{Y}$	0.889	0.595	0.318	0.786	0.127	0.482	0.443	0.786	0.123
N	12,927	12,927	12,927	12,927	12,927	12,927	12,927	12,927	12,927

Source: National Student Clearinghouse.

Note: The sample includes high school graduates from the 2012–2023 cohorts who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. The regression discontinuity bandwidth is set to the optimal calculation of 0.3 based on the on-time college enrollment outcome variable. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Each column represents a separate regression. $\bar{Y}$ denotes the control mean. Standard errors are clustered at the HOPE GPA level, as shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 4: Impacts of HOPE Scholarship on College Choice by Selectivity by Ever-FRPM Status

	SAT Measures				Barron's Rating
	(1) SAT 900+	(2) SAT 1,000+	(3) SAT 1,100+	(4) SAT 1,200+	(5) Selective College
Panel A. All Students					
GPA $\geq$ 3.0	0.033**	0.032**	0.036**	-0.033***	-0.016**
	(0.014)	(0.013)	(0.015)	(0.009)	(0.007)
$\bar{Y}$	0.620	0.559	0.487	0.097	0.041
N	21,678	21,678	21,678	21,678	21,678
Panel B. FRPM Students					
GPA $\geq$ 3.0	0.052**	0.052**	0.058***	0.002	0.003
	(0.020)	(0.021)	(0.020)	(0.009)	(0.006)
$\bar{Y}$	0.473	0.369	0.287	0.044	0.011
N	8,748	8,748	8,748	8,748	8,748
Panel C. Non-FRPM Students					
GPA $\geq$ 3.0	0.026*	0.023	0.031*	-0.055**	-0.027**
	(0.014)	(0.015)	(0.016)	(0.015)	(0.010)
$\bar{Y}$	0.755	0.731	0.670	0.146	0.069
N	12,927	12,927	12,927	12,927	12,927

Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.

Note: The sample includes high school graduates from the 2012–2023 cohorts who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. Selective colleges are those ranked at or above "Very Competitive Plus" under the 2009 Barron's selectivity rating. The regression discontinuity bandwidth is set to the optimal calculation of 0.3 based on the on-time college enrollment outcome variable. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Each column represents a separate regression. $\bar{Y}$ denotes the control mean. Standard errors are clustered at the HOPE GPA level, as shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 5: Impacts of HOPE Scholarship on College Persistence and Completion by Ever-FRPM Status

	College Persistence Post HS Grad			Bachelor's Degree Post HS Grad		
	(1)	(2)	(3)	(4)	(5)	(6)
	2nd Sem. Enrolled	2nd Year Enrolled	3rd Year Enrolled	Any 4-Year Within 6 Years	In-State 4-Year Within 6 Years	In-State 4-Year Public Within 6 Years
Panel A. All Students						
GPA $\geq$ 3.0	0.037***	0.020	0.007	0.018	0.037***	0.036***
	(0.014)	(0.015)	(0.015)	(0.013)	(0.011)	(0.011)
$\bar{Y}$	0.708	0.482	0.386	0.226	0.130	0.117
N	21,678	19,931	16,175	13,919	13,919	13,919
Panel B. FRPM Students						
GPA $\geq$ 3.0	0.072***	0.050**	0.017	0.003	0.037**	0.034**
	(0.022)	(0.024)	(0.024)	(0.018)	(0.016)	(0.016)
$\bar{Y}$	0.597	0.422	0.286	0.135	0.093	0.080
N	8,748	7,945	5,963	5,553	5,553	5,553
Panel C. Non-FRPM Students						
GPA $\geq$ 3.0	0.010	-0.004	-0.000	0.029	0.039**	0.039***
	(0.014)	(0.019)	(0.020)	(0.018)	(0.016)	(0.015)
$\bar{Y}$	0.809	0.614	0.466	0.308	0.164	0.151
N	12,927	11,983	10,206	8,354	8,354	8,354

Source: National Student Clearinghouse.

Note: The sample includes high school graduates who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. The regression discontinuity bandwidth is set to the optimal calculation of 0.3 based on the on-time college enrollment outcome variable. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Each column represents a separate regression. $\bar{Y}$ denotes the control mean. Standard errors are clustered at the HOPE GPA level, as shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 6: Impacts of Zell Miller Scholarship on College Enrollment by Ever-FRPM Status

		Georgia		Sector		In-State 4-Year		Type	
	(1) Any	(2) In	(3) Out	(4) Public	(5) Private	(6) Any	(7) Public	(8) 4-Year	(9) 2-Year
Panel A. All Students									
GPA $\geq$ 3.7	0.005	0.056***	-0.051***	0.032**	-0.026**	0.061***	0.064***	0.012	-0.005
	(0.007)	(0.014)	(0.013)	(0.012)	(0.011)	(0.015)	(0.015)	(0.007)	(0.005)
$\bar{Y}$	0.933	0.609	0.337	0.785	0.162	0.571	0.520	0.903	0.041
N	18,009	18,009	18,009	18,009	18,009	18,009	18,009	18,009	18,009
Panel B. FRPM Students									
GPA $\geq$ 3.7	0.032	0.064*	-0.046	0.071**	-0.052**	0.059	0.080**	0.018	0.005
	(0.026)	(0.036)	(0.031)	(0.034)	(0.029)	(0.039)	(0.040)	(0.029)	(0.019)
$\bar{Y}$	0.871	0.686	0.209	0.714	0.181	0.620	0.546	0.809	0.082
N	3,216	3,216	3,216	3,216	3,216	3,216	3,216	3,216	3,216
Panel C. Non-FRPM Students									
GPA $\geq$ 3.7	-0.001	0.056***	-0.053***	0.022*	-0.020	0.060***	0.058***	0.010	-0.006
	(0.006)	(0.016)	(0.016)	(0.013)	(0.012)	(0.017)	(0.017)	(0.007)	(0.005)
$\bar{Y}$	0.949	0.589	0.371	0.803	0.157	0.561	0.516	0.928	0.030
N	14,783	14,783	14,783	14,783	14,783	14,783	14,783	14,783	14,783

Source: National Student Clearinghouse.

Note: The sample includes high school graduates from the 2012–2023 cohorts who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. The regression discontinuity bandwidth is set to the optimal calculation of 0.25 based on the on-time college enrollment outcome variable. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Each column represents a separate regression. $\bar{Y}$ denotes the control mean. Standard errors are clustered at the HOPE GPA level, as shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 7: Impacts of Zell Miller Scholarship on College Choice by Selectivity by Ever-FRPM Status

	SAT Measures				Barron's Rating
	(1) SAT 900+	(2) SAT 1,000+	(3) SAT 1,100+	(4) SAT 1,200+	(5) Selective College
Panel A. All Students					
GPA $\geq$ 3.7	0.012	0.015	0.018*	0.006	0.020
	(0.008)	(0.009)	(0.009)	(0.017)	(0.018)
$\bar{Y}$	0.883	0.869	0.842	0.486	0.389
N	18,009	18,009	18,009	18,009	18,009
Panel B. FRPM Students					
GPA $\geq$ 3.7	0.016	0.029	0.032	0.029	0.025
	(0.032)	(0.033)	(0.031)	(0.031)	(0.029)
$\bar{Y}$	0.769	0.722	0.657	0.231	0.189
N	3,216	3,216	3,216	3,216	3,216
Panel C. Non-FRPM Students					
GPA $\geq$ 3.7	0.011	0.011	0.013	0.001	0.018
	(0.008)	(0.008)	(0.009)	(0.018)	(0.019)
$\bar{Y}$	0.913	0.908	0.891	0.553	0.444
N	14,783	14,783	14,783	14,783	14,783

Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.

Note: The sample includes high school graduates from the 2012–2023 cohorts who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. The regression discontinuity bandwidth is set to the optimal calculation of 0.25 based on the on-time college enrollment outcome variable. Selective colleges are colleges rated "Very Competitive Plus" or above in Barron's college selectivity classifications. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Each column represents a separate regression. $\bar{Y}$ denotes the control mean. Standard errors are clustered at the HOPE GPA level, as shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 8: Impacts of Zell Miller Scholarship on College Persistence and Completion by Ever-FRPM Status

	College Persistence Post HS Grad			Bachelor's Degree Post HS Grad		
	(1)	(2)	(3)	(4)	(5)	(6)
	2nd Sem. Enrolled	2nd Year Enrolled	3rd Year Enrolled	Any 4-Year Within 6 Years	In-State 4-Year Within 6 Years	In-State 4-Year Public Within 6 Years
Panel A. All Students						
GPA $\geq$ 3.7	0.016*	0.001	-0.009	-0.014	0.009	0.011
	(0.008)	(0.012)	(0.016)	(0.015)	(0.018)	(0.019)
$\bar{Y}$	0.899	0.728	0.632	0.583	0.378	0.348
N	18,009	16,034	13,548	9,187	9,187	9,187
Panel B. FRPM Students						
GPA $\geq$ 3.7	0.027	0.023	0.053	0.019	0.061	0.069
	(0.025)	(0.034)	(0.040)	(0.046)	(0.053)	(0.051)
$\bar{Y}$	0.826	0.668	0.555	0.437	0.309	0.276
N	3,216	2,802	2,170	1,544	1,544	1,544
Panel C. Non-FRPM Students						
GPA $\geq$ 3.7	0.013	-0.003	-0.020	-0.018	0.001	-0.000
	(0.008)	(0.013)	(0.017)	(0.016)	(0.020)	(0.020)
$\bar{Y}$	0.919	0.743	0.649	0.619	0.395	0.366
N	14,783	13,222	11,370	7,616	7,616	7,616

Source: National Student Clearinghouse.

Note: The sample includes high school graduates who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. The regression discontinuity bandwidth is set to the optimal calculation of 0.25 based on the on-time college enrollment outcome variable. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Each column represents a separate regression. $\bar{Y}$ denotes the control mean. Standard errors are clustered at the HOPE GPA level, as shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 9: Effects of HOPE and Zell Miller Scholarship Eligibility on STEM Degree Attainment

	HOPE (GPA $\geq$ 3.0)		Zell Miller (GPA $\geq$ 3.7)	
	Any STEM	In-State STEM	Any STEM	In-State STEM
Panel A. All Students				
GPA $\geq$ Cutoff	-0.006	0.001	0.024	0.041**
	(0.014)	(0.012)	(0.022)	(0.020)
$\bar{Y}$	0.054	0.039	0.204	0.150
N	5,633	5,633	4,494	4,494
Panel B. FRPM Students				
GPA $\geq$ Cutoff	0.004	0.013	0.066	0.047
	(0.017)	(0.014)	(0.055)	(0.054)
$\bar{Y}$	0.030	0.022	0.150	0.117
N	2,539	2,539	760	760
Panel C. Non-FRPM Students				
GPA $\geq$ Cutoff	-0.008	-0.001	0.017	0.040*
	(0.023)	(0.018)	(0.026)	(0.024)
$\bar{Y}$	0.084	0.060	0.219	0.159
N	3,081	3,081	3,706	3,706

Source: National Student Clearinghouse and the 2020 U.S. Department of Homeland Security STEM Designated Degree Program List.

Note: The sample includes high school graduates from the 2012–2018 cohorts who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. The sample size is smaller than for the degree attainment outcomes because of missingness in the NSC major code. The regression discontinuity bandwidth is set to the optimal bandwidth of 0.3 for HOPE and 0.25 for Zell, calculated based on the on-time college enrollment outcome. All specifications control for student demographics (sex, race/ethnicity, ever eligible for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Each column represents a separate regression. $\bar{Y}$ denotes the control mean. Standard errors are clustered at the HOPE GPA level and are reported in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 10: High School Course-Taking Behavior by HOPE and Zell Miller Scholarship Eligibility

	HOPE				Zell Miller			
	(1) Rigor	(2) AP	(3) IB	(4) Dual	(5) Rigor	(6) AP	(7) IB	(8) Dual
Ever During HS		-0.016	-0.001	0.004		-0.001	0.001	0.030
		(0.025)	(0.004)	(0.016)		(0.020)	(0.005)	(0.026)
$\bar{Y}$	1.00	0.62	0.02	0.14	1.00	0.73	0.03	0.35
During 10th	0.001	-0.027	-	-	-0.077	-0.018	-	-
	(0.103)	(0.031)	-	-	(0.117)	(0.042)	-	-
$\bar{Y}$	3.49	0.32	0.00	0.00	5.32	0.57	0.00	0.00
During 11th	-0.162	-0.071	-0.008	-0.012	-0.104	-0.065	0.003	0.045
	(0.115)	(0.072)	(0.015)	(0.012)	(0.129)	(0.105)	(0.023)	(0.034)
$\bar{Y}$	5.50	1.30	0.06	0.02	5.74	2.04	0.09	0.07
During 12th	-0.095	-0.042	-0.029	0.014	-0.054	0.002	0.022	0.057
	(0.099)	(0.084)	(0.020)	(0.049)	(0.147)	(0.114)	(0.029)	(0.086)
$\bar{Y}$	4.53	1.42	0.07	0.37	4.32	1.89	0.11	0.86
N	11,885	11,885	11,885	11,885	6,155	6,155	6,155	6,155

Note: The sample includes high school graduates from the 2012–2017 cohorts who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. The regression discontinuity bandwidth is set to the optimal calculation of 0.3 for HOPE and 0.25 for Zell based on the on-time college enrollment outcome variable. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Each column represents a separate regression. $\bar{Y}$ denotes the control mean. Standard errors are clustered at the HOPE GPA level, as shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 11: Effects of HOPE Scholarship on College Outcomes by Measures of Socioeconomic Status

	Non-FRPM	By FRPM Measures			By HS Poverty		
	(1)	(2) Ever	(3) Persistently	(4) Only Free	(5) High	(6) Medium	(7) Low
Enrollment	0.000	0.063***	0.056***	0.066***	0.087***	0.002	0.009
	(0.011)	(0.018)	(0.021)	(0.019)	(0.024)	(0.016)	(0.013)
In-State	0.055***	0.076***	0.076***	0.082***	0.084***	0.052**	0.058***
	(0.017)	(0.024)	(0.028)	(0.027)	(0.027)	(0.023)	(0.022)
Full-Time	0.013	0.046***	0.026	0.050**	0.067**	0.011	0.014
	(0.013)	(0.021)	(0.024)	(0.023)	(0.030)	(0.018)	(0.017)
4-Year	0.015	0.057***	0.058***	0.067***	0.051	0.019	0.029*
	(0.017)	(0.019)	(0.023)	(0.021)	(0.032)	(0.022)	(0.016)
Public	0.028**	0.052***	0.049**	0.059***	0.071***	0.028	0.021
	(0.013)	(0.018)	(0.022)	(0.019)	(0.025)	(0.019)	(0.018)
SAT 900+	0.026*	0.052**	0.048**	0.058***	0.058**	0.012	0.033*
	(0.014)	(0.020)	(0.023)	(0.020)	(0.028)	(0.020)	(0.018)
SAT 1000+	0.023	0.052**	0.050**	0.060***	0.065***	0.008	0.030
	(0.015)	(0.021)	(0.022)	(0.020)	(0.024)	(0.021)	(0.019)
SAT 1100+	0.031*	0.058***	0.049**	0.059***	0.051**	0.028	0.030
	(0.016)	(0.020)	(0.024)	(0.021)	(0.023)	(0.022)	(0.020)
SAT 1200+	-0.055**	0.002	0.001	0.002	-0.001	-0.037**	-0.047***
	(0.015)	(0.009)	(0.009)	(0.008)	(0.011)	(0.015)	(0.016)
2nd Sem. Persist	0.010	0.072***	0.068***	0.077***	0.086***	0.015	0.023
	(0.014)	(0.022)	(0.025)	(0.023)	(0.033)	(0.017)	(0.017)
2nd Year Persist	-0.004	0.050**	0.042	0.051**	0.064*	0.014	-0.004
	(0.019)	(0.024)	(0.026)	(0.023)	(0.032)	(0.021)	(0.022)
3rd Year Persist	-0.000	0.017	0.024	0.035	0.044	0.006	-0.013
	(0.020)	(0.024)	(0.021)	(0.018)	(0.024)	(0.019)	(0.021)
Any	0.029	0.003	0.021	0.008	0.003	0.012	0.042*
4-Year Grad	(0.018)	(0.018)	(0.020)	(0.019)	(0.025)	(0.021)	(0.022)
In-State	0.039**	0.037**	0.047**	0.041**	0.028	0.029	0.056**
4-Year Grad	(0.016)	(0.016)	(0.020)	(0.018)	(0.021)	(0.022)	(0.023)
In-State Public	0.039**	0.034**	0.045**	0.041**	0.018	0.034*	0.053***
4-Year Grad	(0.015)	(0.016)	(0.019)	(0.016)	(0.019)	(0.020)	(0.019)
N	12,927	8,748	6,931	8,041	5,167	7,894	8,613

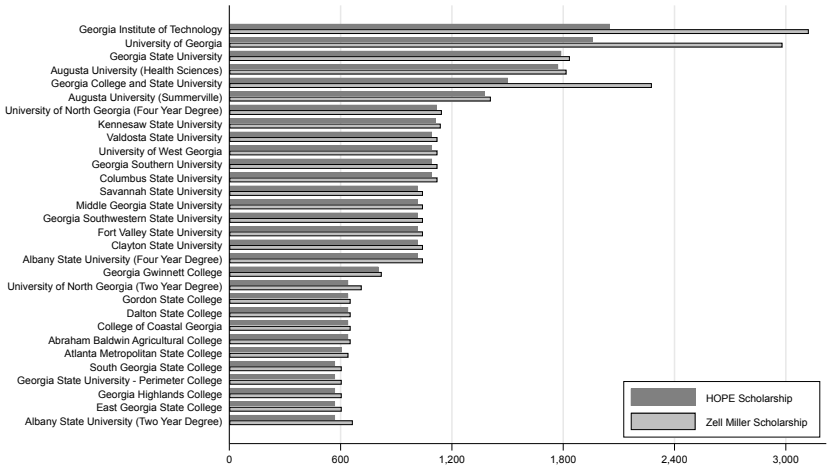
Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.
Note: The sample includes high school graduates who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. The regression discontinuity bandwidth is set to the optimal calculation of 0.3 based on the on-time college enrollment outcome variable. All specifications control for student demographics (sex, race/ethnicity, English Learner status, and disability status for all Columns, plus ever FRPM eligibility for Columns 5-7) and include high school-by-cohort fixed effects. Each column represents a separate regression. Standard errors are clustered at the HOPE GPA level, as shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Online Appendix

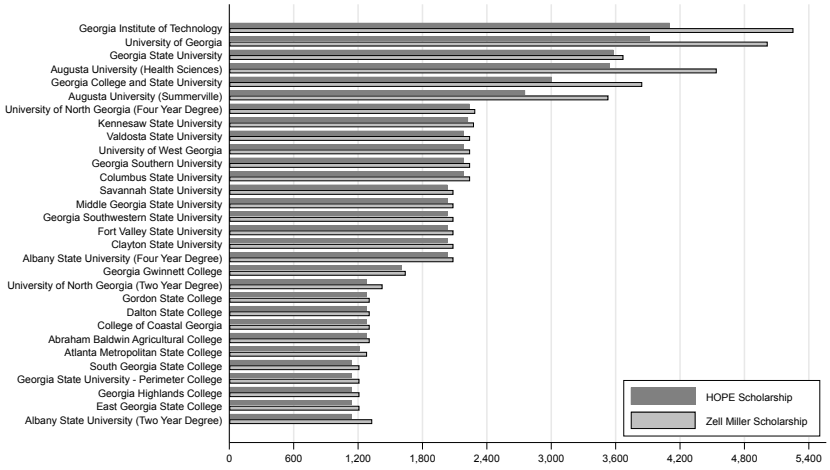
A Supplementary Figures and Tables

Figure A1: Scholarship Award Amounts by Institution in the University System of Georgia

(a) 6 Credit Hours

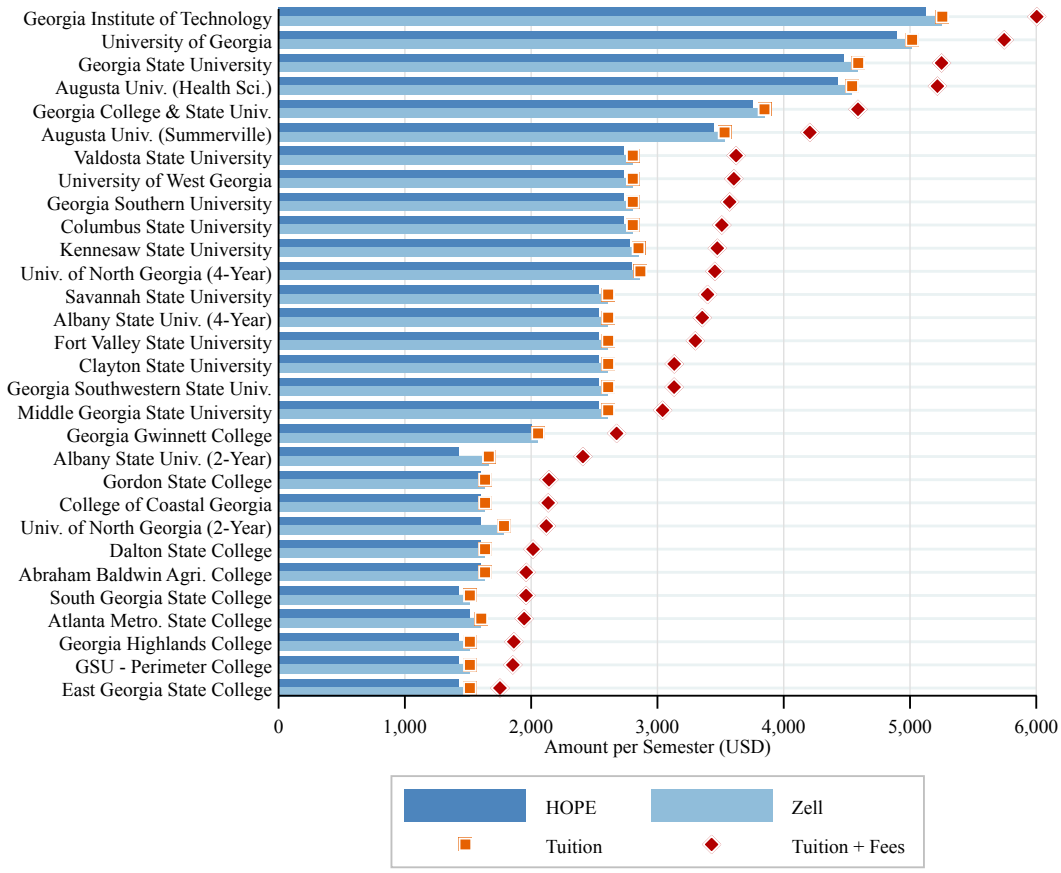


(b) 12 Credit Hours



Source: Georgia Student Finance Commission (2025).
Note: Panel A shows award amounts at University System of Georgia institutions for students attempting 6 credit hours, and Panel B shows award amounts for students attempting 12 credit hours in Fiscal Year 2025.

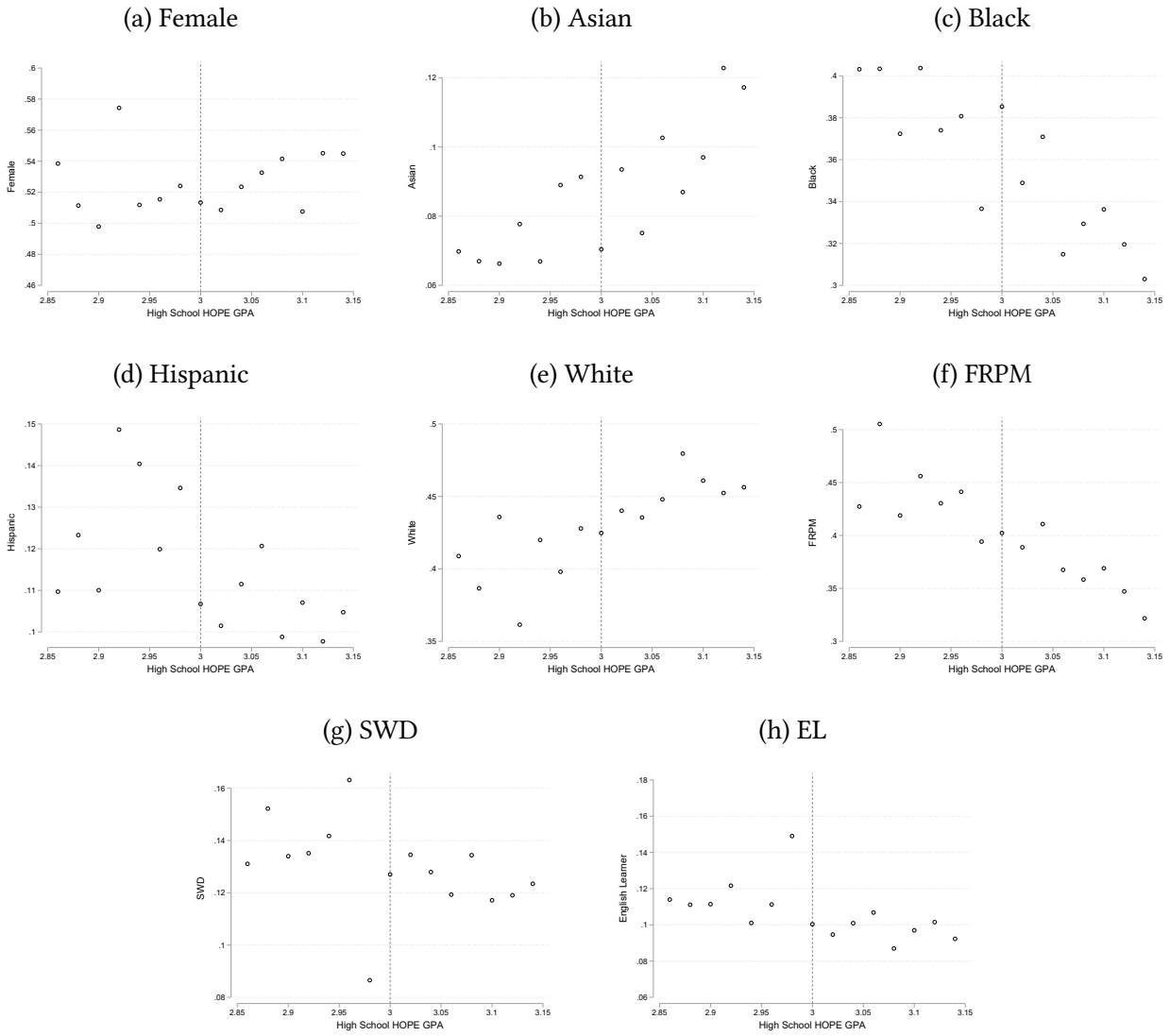
Figure A2: HOPE and Zell Miller Scholarship Amount Differences



Source: Georgia Student Finance Commission (FY 2025) and University System of Georgia (https://www.usg.edu/fiscal-affairs/tuition-and-fees/)

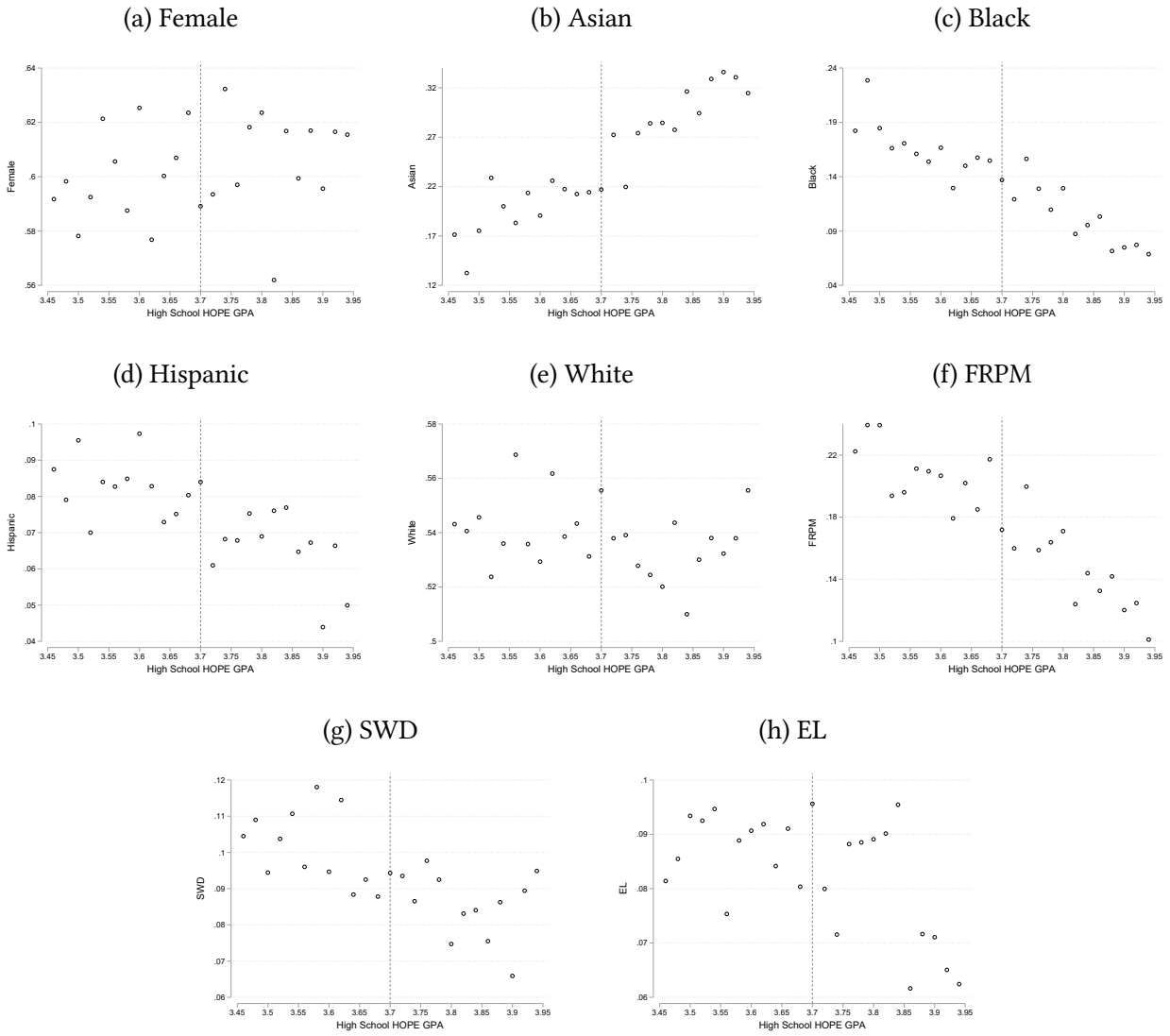
Note: The figure plots scholarship amounts for HOPE Scholarship and Zell Miller Scholarship recipients enrolled in Fall 2025 with 15 credit hours at institutions within the University System of Georgia. "Tuition" includes tuition only, while "Tuition + Fees" includes both tuition and fees for one academic semester in Fall 2025. The Zell Miller award equals tuition, whereas neither scholarship covers fees.

Figure A3: HOPE Scholarship Covariate Balance Check by Student Demographics



Note: The figures show the covariate balance test for student demographic characteristics. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. Each figure shows the fraction of student subgroups that fall within the scholarship eligibility threshold, grouped into 0.05 GPA bins.

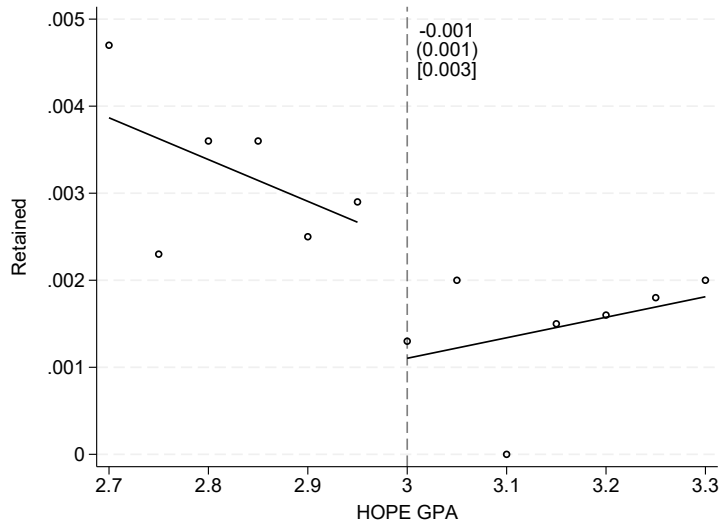
Figure A4: Zell Miller Scholarship Covariate Balance Check by Student Demographics



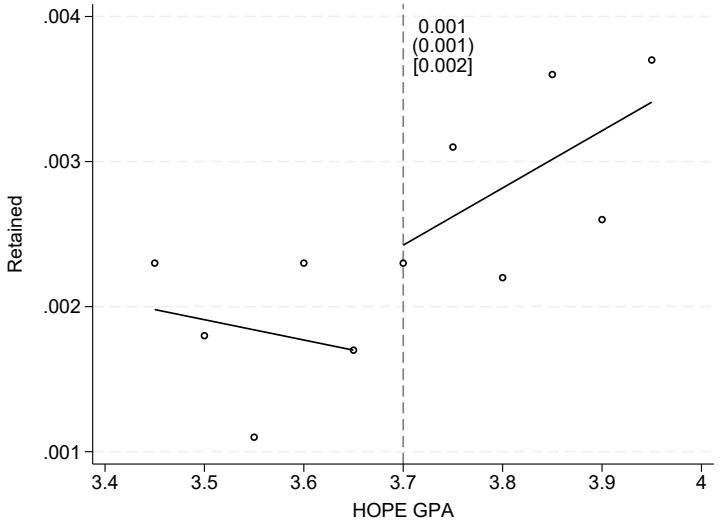
Note: The figures show the covariate balance test for student demographic characteristics. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. Each figure shows the fraction of student subgroups that fall within the scholarship eligibility threshold, grouped into 0.05 GPA bins.

Figure A5: Grade Retention Rate During High School Around Scholarship Cutoff

(a) HOPE



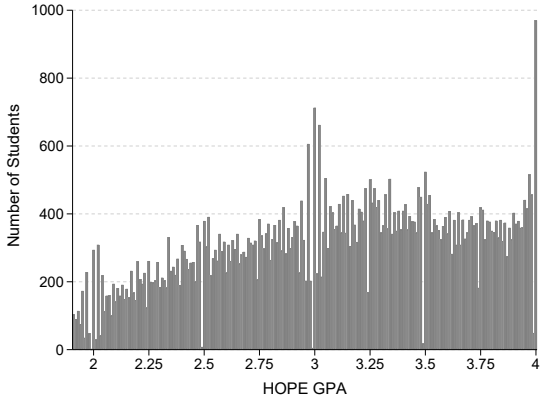
(b) Zell Miller



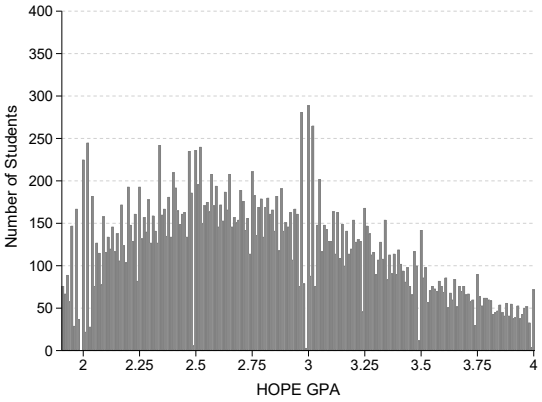
Note: Each figure shows the regression discontinuity for high school grade retention around each HOPE (3.0, Panel A) and Zell (3.7, Panel B) cutoff, over the final HOPE GPA. The RD coefficient in each cutoff is reported in text, with standard errors clustered on HOPE GPA in parentheses and the control mean in brackets. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements.

Figure A6: HOPE Cutoff GPA Density Histogram

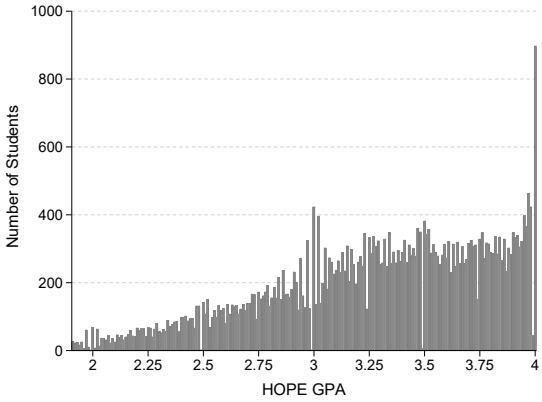
(a) Observed GPA Density



(b) GPA Density Among FRPM



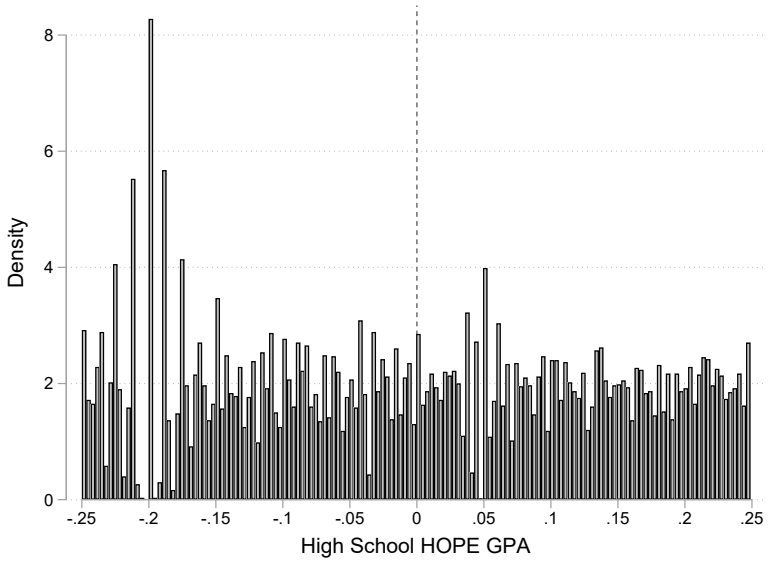
(c) GPA Density Among Non-FRPM



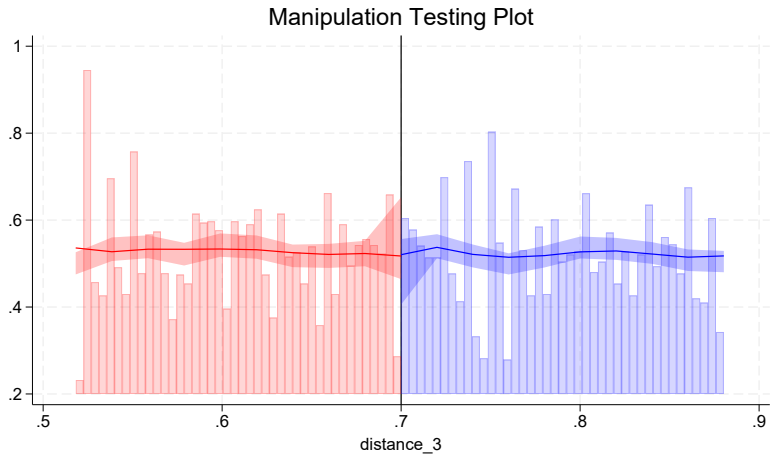
Note: The graphs display density histograms of students' high school HOPE GPA. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. Panel (a) shows the distribution of observed HOPE GPAs for the full sample. Panel (b) presents the GPA distribution for students eligible for free or reduced-price meals (FRPM), while Panel (c) shows the distribution for students who are not FRPM-eligible.

Figure A7: McCrary Density Test

(a) Zell Density Plot



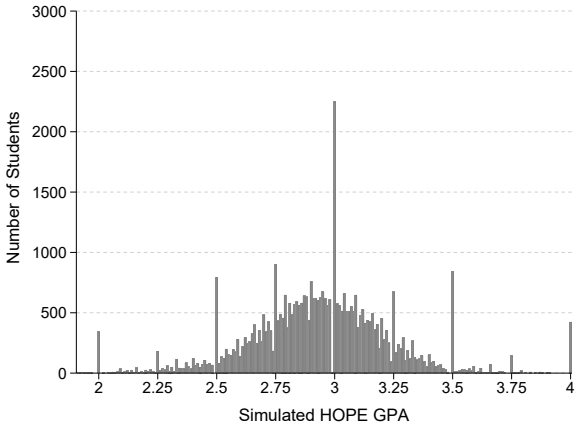
(b) Zell Density Test



Note: The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months prior to enrolling in college and met the academic rigor requirements. Panel (a) shows the full density of HOPE GPAs, with the 3.7 threshold normalized to zero. Panel (b) presents a density test (p-value = 0.211, t = −1.251) around the cutoff of 3.7 following McCrary (2008).

Figure A8: GPA Density Histogram

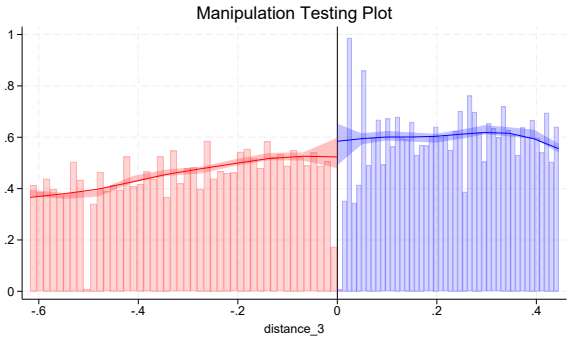
(a) Simulated GPA Density



(b) McCrary Density with 3.0

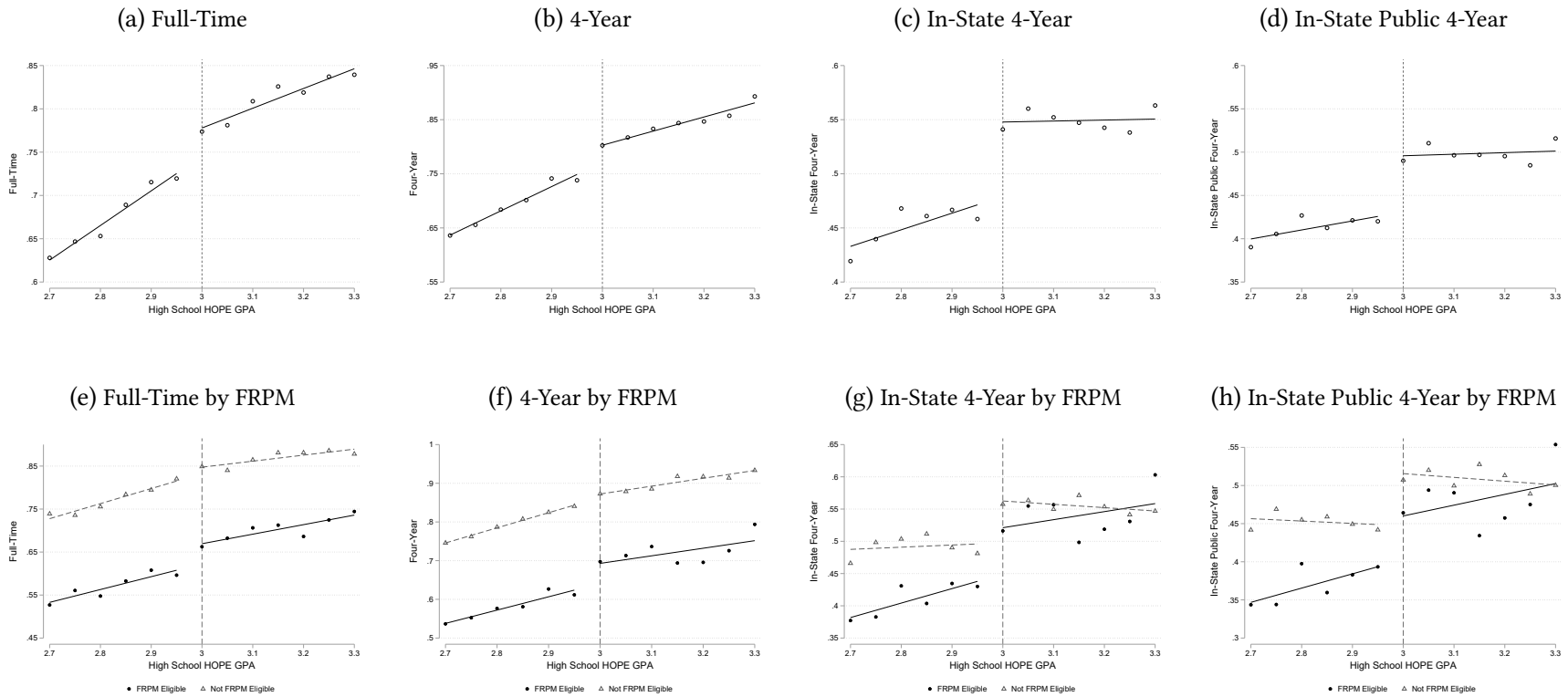


(c) McCrary Density without 3.0



Note: The graphs display density histograms of students' high school HOPE GPA. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. Panel (a) displays a simulated GPA distribution constructed by randomly assigning course grades to students. Panel (b) presents the GPA density test with 3.0 values, and Panel (c) presents the GPA density test without 3.0 values following McCrary (2008).

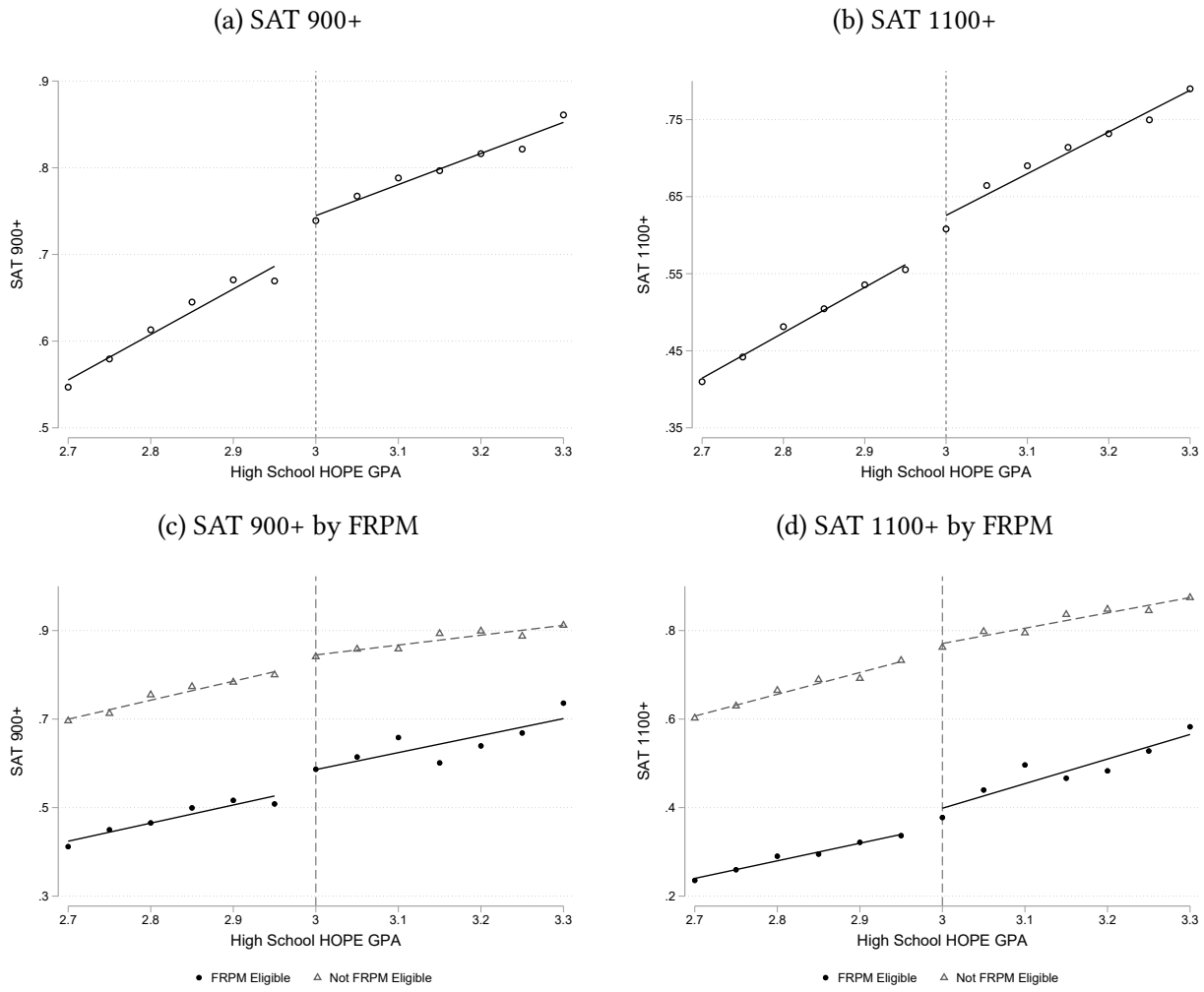
Figure A9: HOPE Scholarship Impacts on College Enrollment



Source: National Student Clearinghouse.

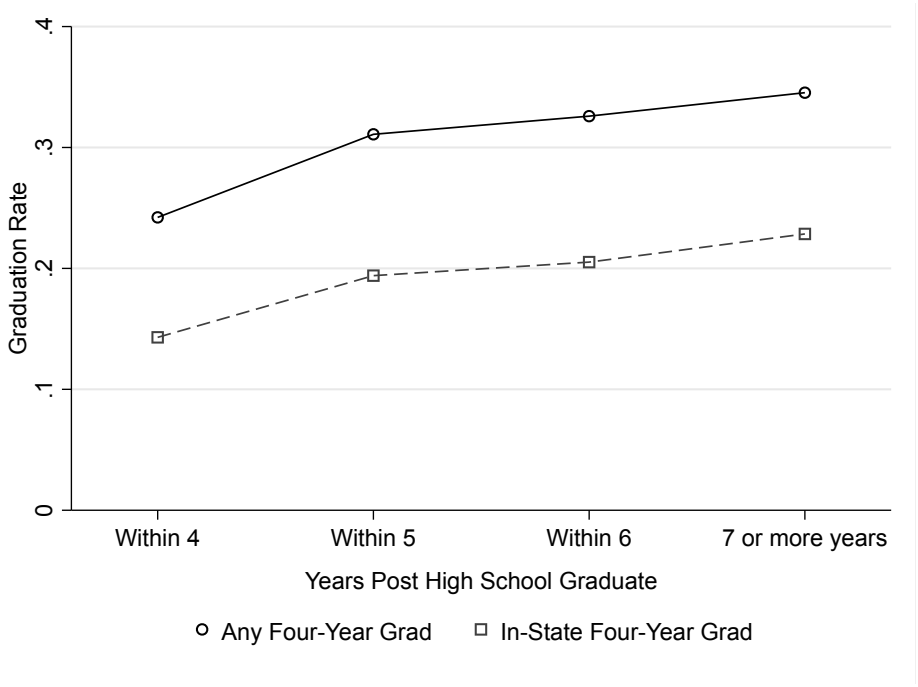
Note: Each figure displays the main regression discontinuity for college enrollment outcomes. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. "FRPM Eligible" indicates students who were ever eligible for free or reduced-price meals during K12 enrollment, while "Not FRPM Eligible" indicates students who were never eligible. The regression discontinuity bandwidth is set to the optimal calculation of 0.3 based on the on-time college enrollment outcome.

Figure A10: HOPE Scholarship Impacts on College Choice by Selectivity



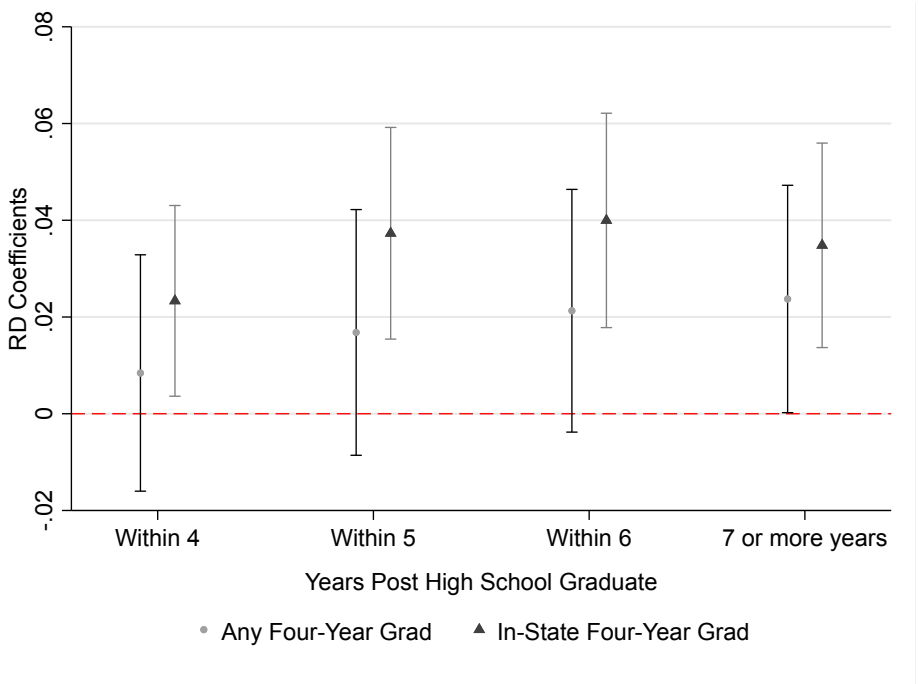
Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.
Note: Each figure displays the main regression discontinuity for college choice by selectivity outcomes. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. "FRPM Eligible" indicates students who were ever eligible for free or reduced-price meals during K12 enrollment, while "Not FRPM Eligible" indicates students who were never eligible. The regression discontinuity bandwidth is set to the optimal calculation of 0.3 based on on-time college enrollment outcome.

Figure A11: Graduation Rate by Year by Institution



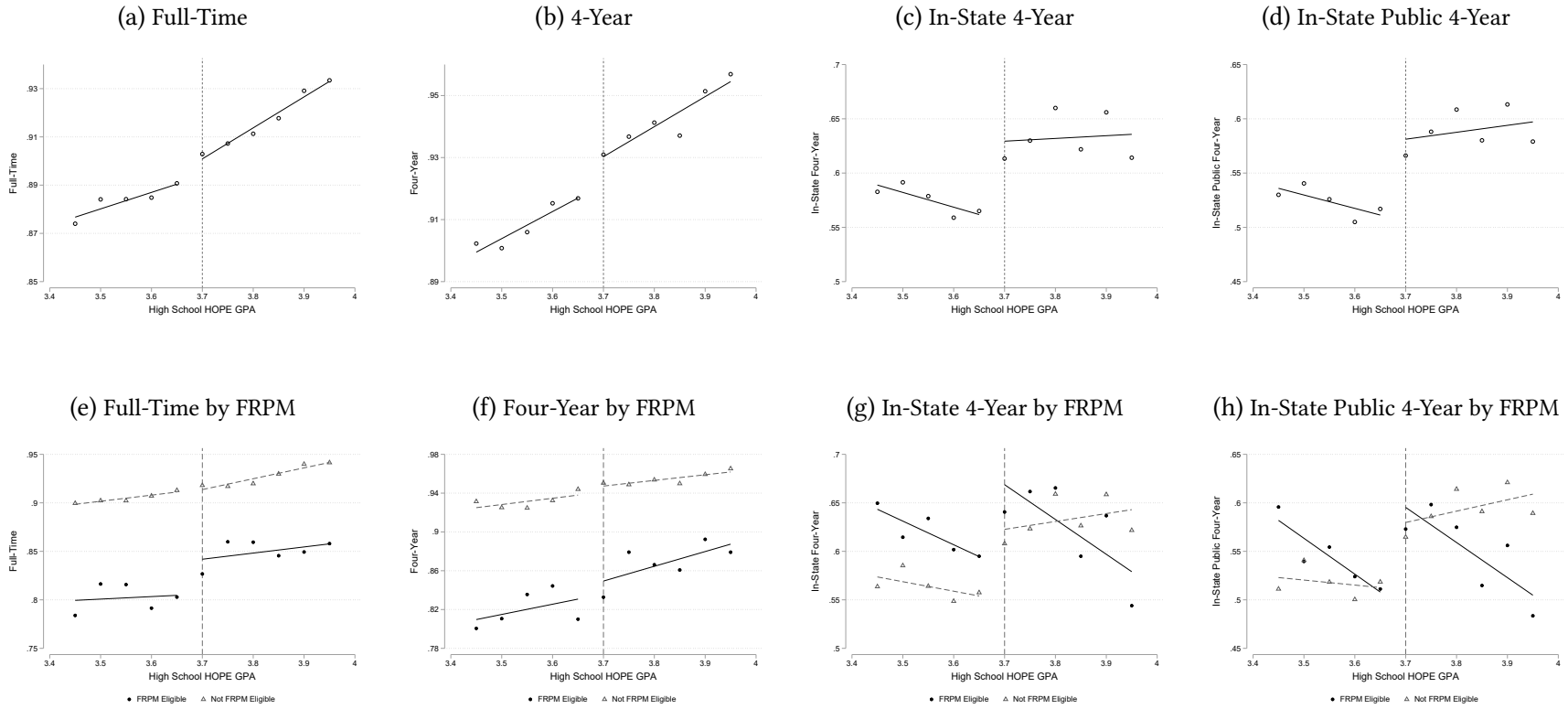
Source: National Student Clearinghouse.
Note: The figure presents the graduation rate for students attending any four-year and in-state four-year college by years: within 4 years, within 5 years, within 6 years, and 7 or more years. The sample includes high school graduates from the 2012-2018 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements.

Figure A12: HOPE Scholarship Impacts on Graduation by Years



Source: National Student Clearinghouse.
Note: The figure shows regression discontinuity estimates of graduation rates for students attending any four-year college and in-state four-year colleges, measured at 4, 5, 6, and 7 or more years after high school. The sample includes high school graduates from the 2012–2018 cohorts who resided in Georgia for at least 12 consecutive months prior to graduation and met the academic rigor requirements. College enrollment data are drawn from the National Student Clearinghouse. All specifications control for student demographics (sex, race/ethnicity, eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Each line with coefficients represents a 95 percent confidence interval, and the optimal RD bandwidth is 0.3.

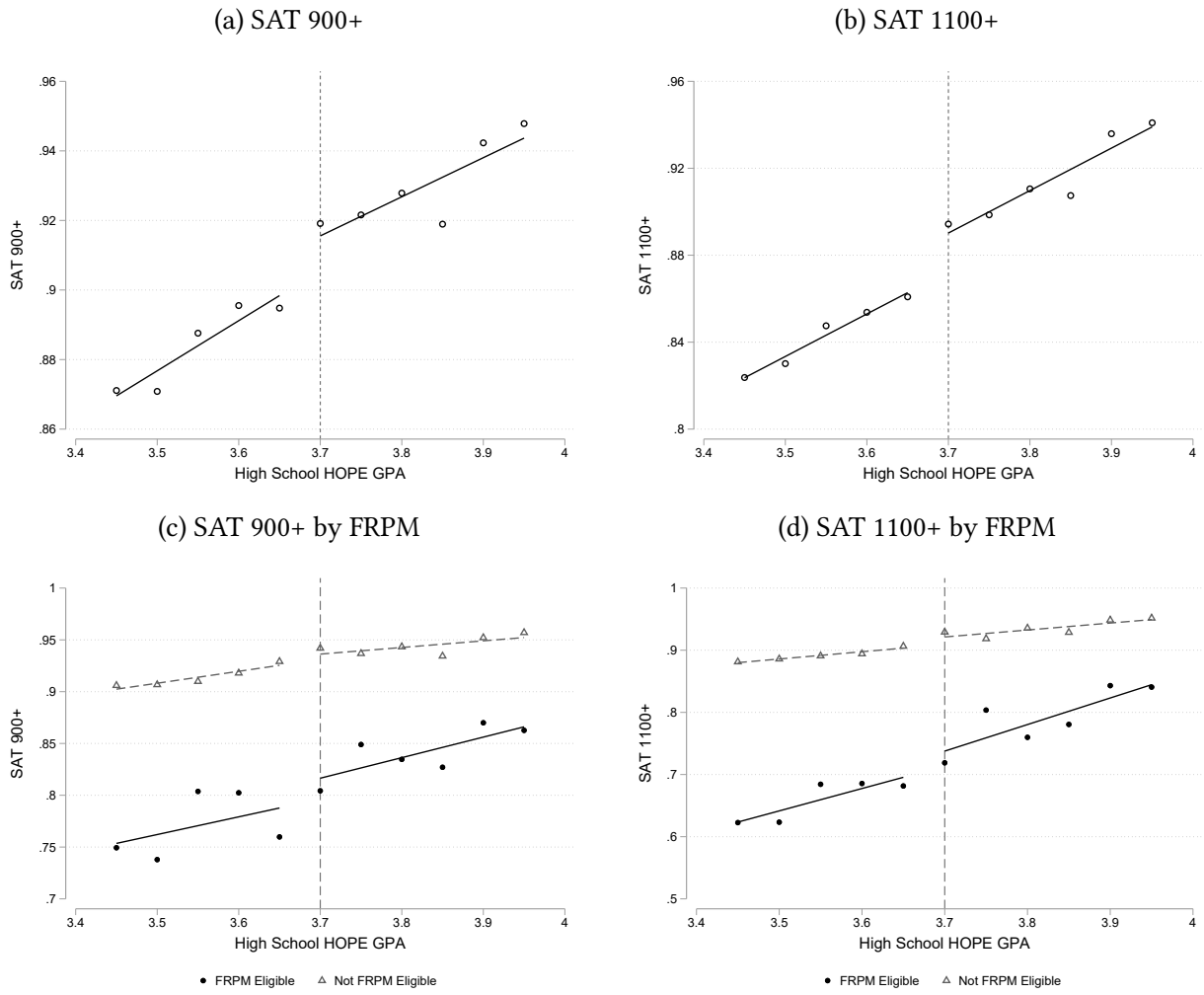
Figure A13: Zell Miller Scholarship Impacts on College Enrollment



Source: National Student Clearinghouse.

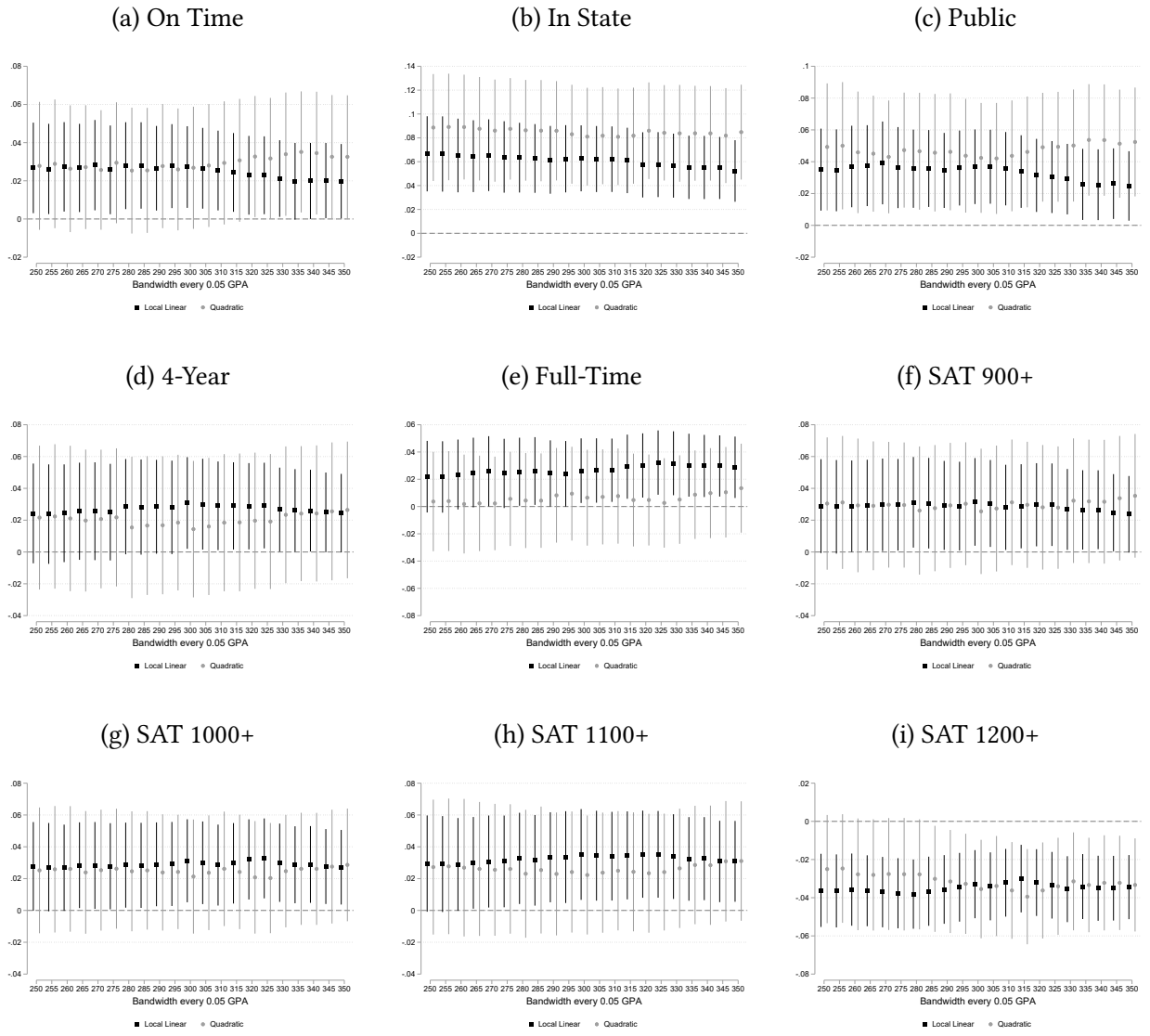
Note: Each figure displays the main regression discontinuity for college enrollment outcomes. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. "FRPM Eligible" indicates students who were ever eligible for free or reduced-price meals during K12 enrollment, while "Not FRPM Eligible" indicates students who were never eligible. The regression discontinuity bandwidth is set to the optimal calculation of 0.25 based on on-time college enrollment outcome.

Figure A14: Zell Miller Scholarship Impacts on College Choice by Selectivity



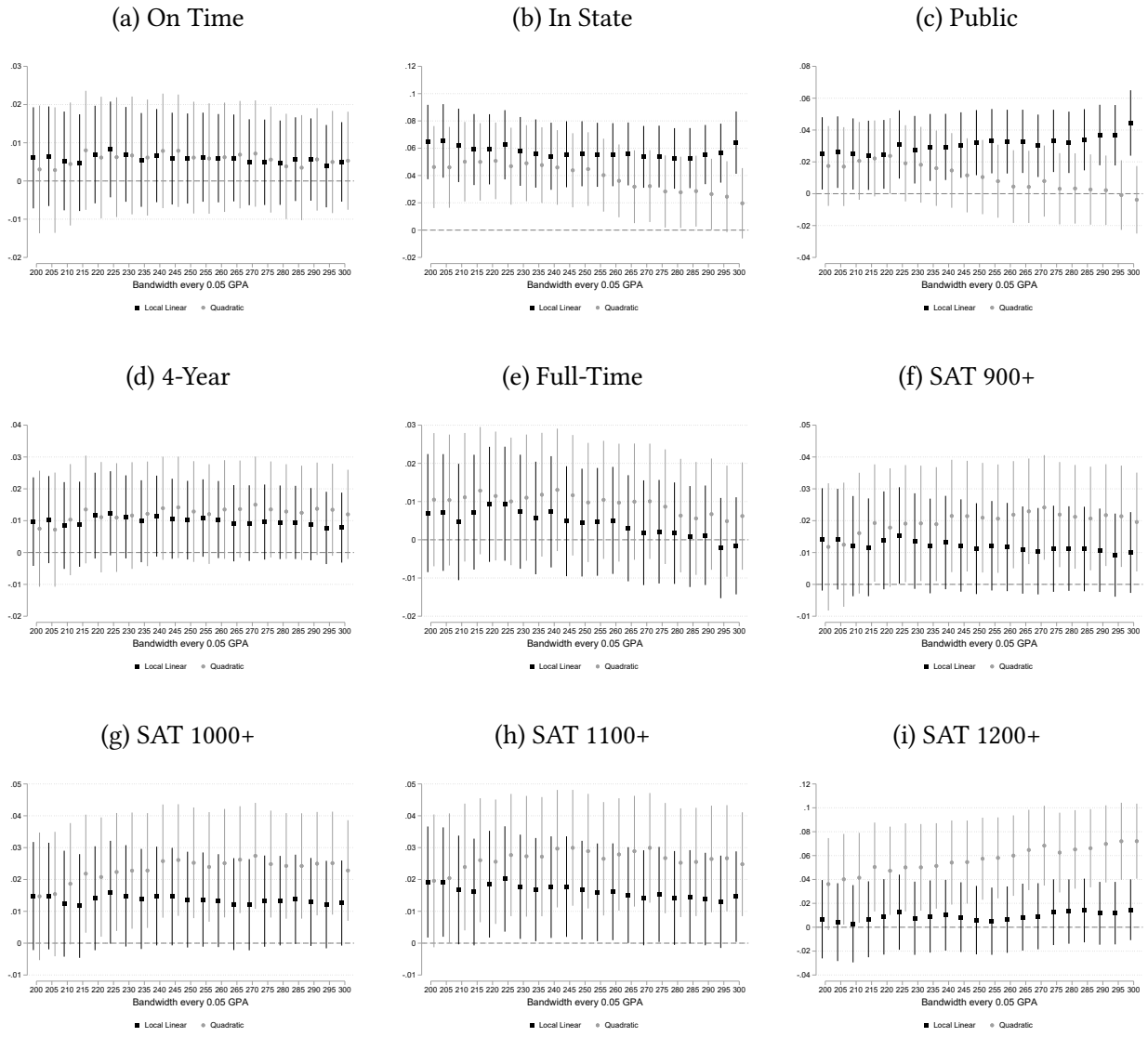
Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.
Note: Each figure displays the main regression discontinuity for college choice by selectivity outcomes. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. "FRPM Eligible" indicates students who were ever eligible for free or reduced-price meals during K12 enrollment, while "Not FRPM Eligible" indicates students who were never eligible. The regression discontinuity bandwidth is set to the optimal calculation of 0.25 based on on-time college enrollment outcome.

Figure A15: HOPE Scholarship Different Bandwidth Selection Test by Functional Form for College Enrollment Outcomes



Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.
Note: Each figure displays a different bandwidth selection test by functional form of linear and quadratic regression for college enrollment outcomes. Each figure presents point estimates and 95 percent confidence intervals from linear and quadratic specifications estimated using bandwidths from 0.25 to 0.35 in 0.005 increments; "300" denotes the optimal bandwidth of 0.3. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects.

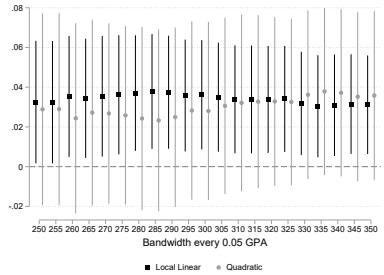
Figure A16: Zell Miller Scholarship Different Bandwidth Selection Test by Functional Form for College Enrollment Outcomes



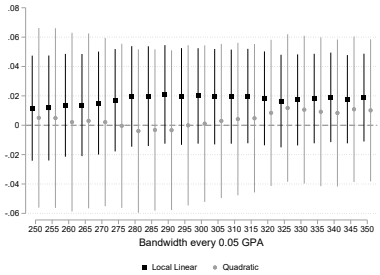
Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.
Note: Each figure displays a different bandwidth selection test by functional form of linear and quadratic regression for college enrollment outcomes. Each figure presents point estimates and 95 percent confidence intervals from linear and quadratic specifications estimated using bandwidths from 0.20 to 0.30 in 0.005 increments; "250" denotes the optimal bandwidth of 0.25. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects.

Figure A17: HOPE Scholarship Different Bandwidth Selection Test by Functional Form for College Persistence and Completion Outcomes

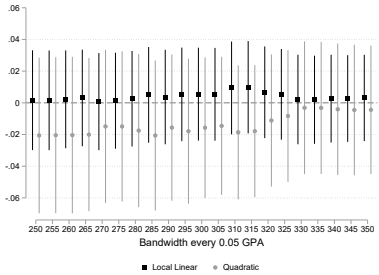
(a) Second Semester Persist



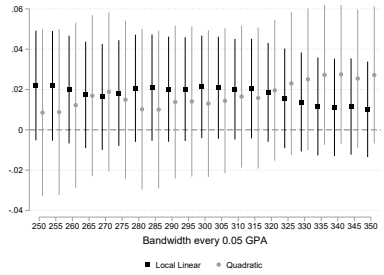
(b) Second Year Persist



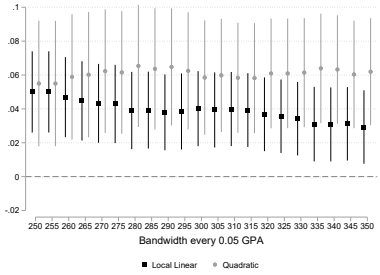
(c) Third Year Persist



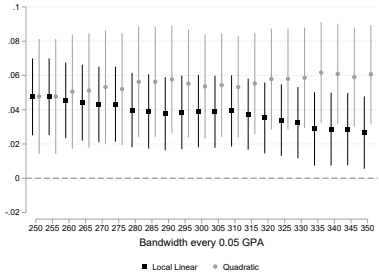
(d) 4-Year Grad



(e) In-State 4-Year Grad



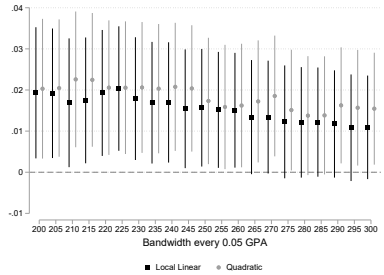
(f) In-State Public 4-Year Grad



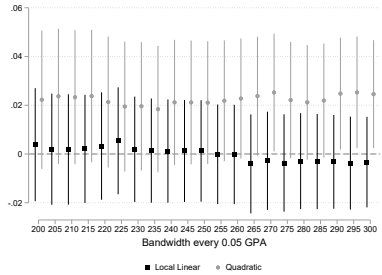
Source: National Student Clearinghouse.
Note: Each figure displays a different bandwidth selection test by functional form of linear and quadratic regression for college persistence and completion outcomes. Each figure presents point estimates and 95 percent confidence intervals from linear and quadratic specifications estimated using bandwidths from 0.25 to 0.35 in 0.005 increments; "300" denotes the optimal bandwidth of 0.3. The sample includes high school graduates who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects.

Figure A18: Zell Miller Scholarship Different Bandwidth Selection Test by Functional Form for College Persistence and Completion Outcomes

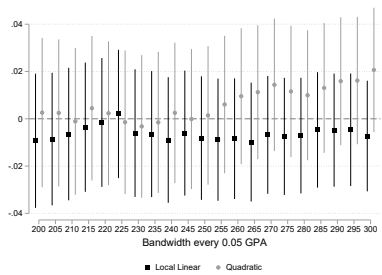
(a) Second Semester Persist



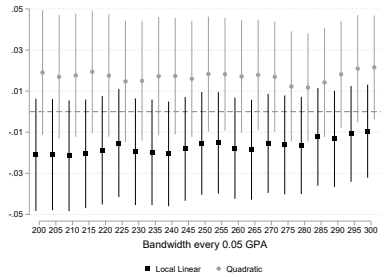
(b) Second Year Persist



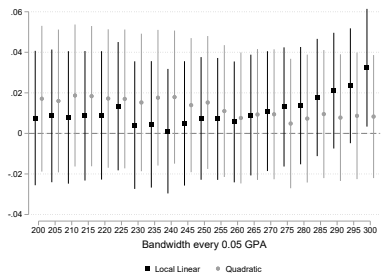
(c) Third Year Persist



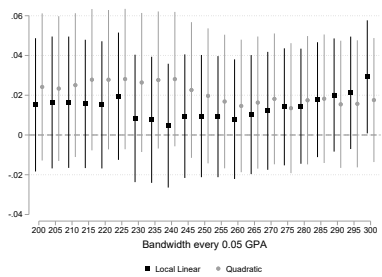
(d) 4-Year Grad



(e) In-State 4-Year Grad

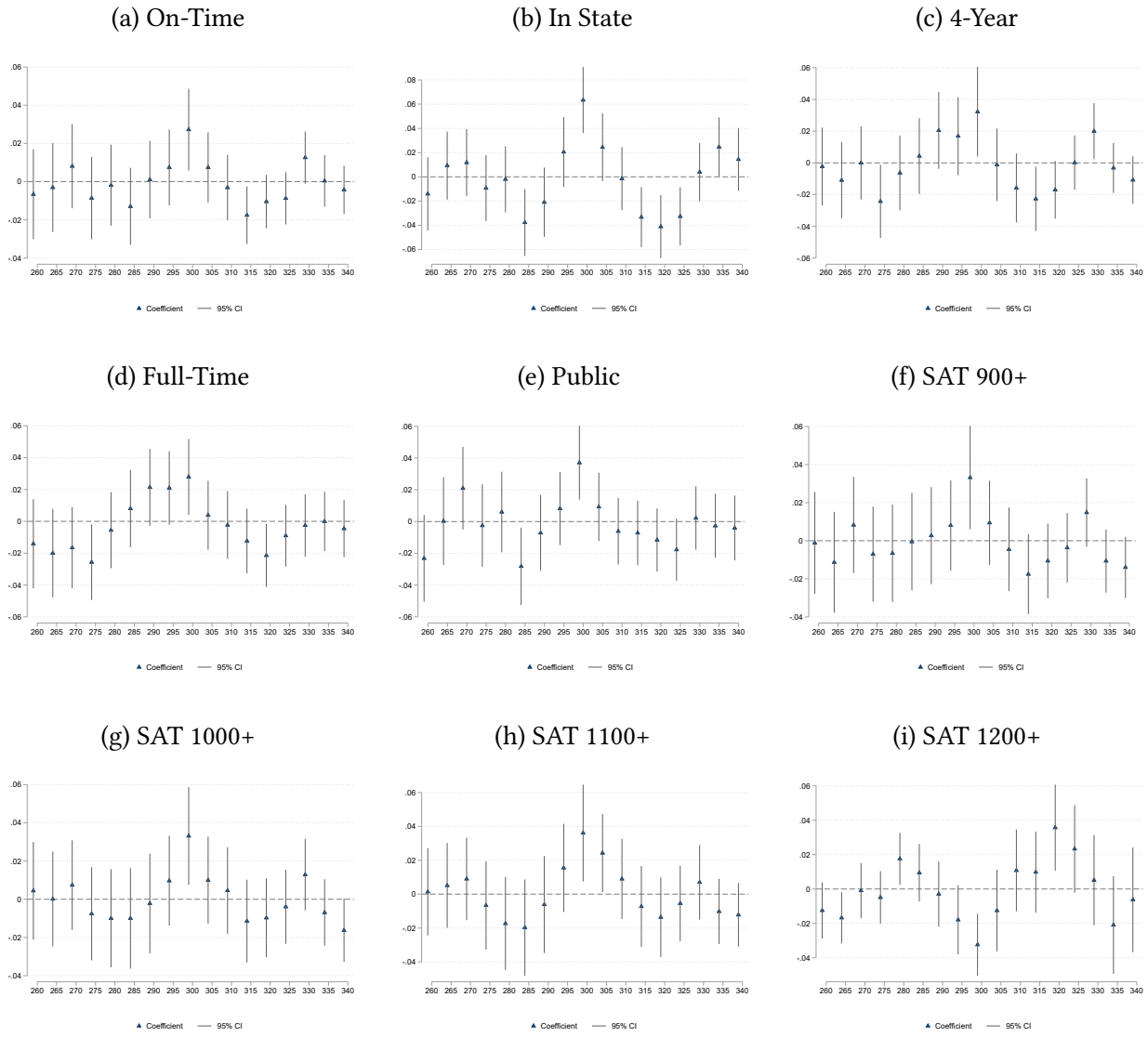


(f) In-State Public 4-Year Grad



Source: National Student Clearinghouse.
Note: Each figure displays a different bandwidth selection test by functional form of linear and quadratic regression for college persistence and completion outcomes. Each figure presents point estimates and 95 percent confidence intervals from linear and quadratic specifications estimated using bandwidths from 0.20 to 0.30 in 0.005 increments; "250" denotes the optimal bandwidth of 0.25. The sample includes high school graduates who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects.

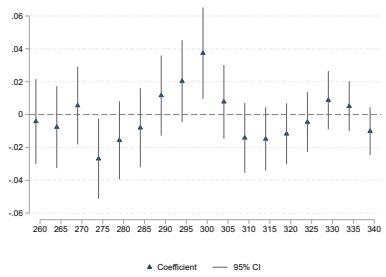
Figure A19: HOPE Scholarship Random Cutoff Trial for College Enrollment Outcomes



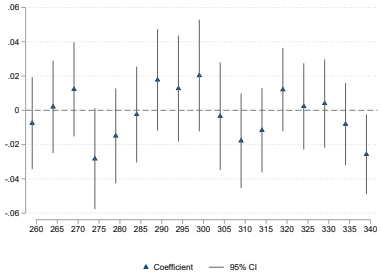
Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.
Note: Each figure displays random cutoff falsification tests for college enrollment outcomes. Each figure presents point estimates and 95 percent confidence intervals on each cutoff; "300" denotes the actual cutoff of 3.0. The regression discontinuity bandwidth is set to the optimal calculation of 0.3. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects.

Figure A20: HOPE Scholarship Random Cutoff Trial for College Persistence and Completion Outcomes

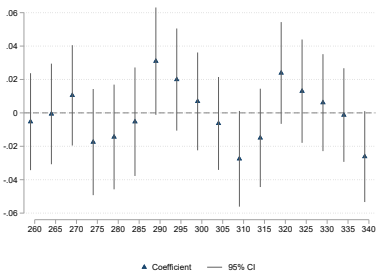
(a) Second Semester Persist



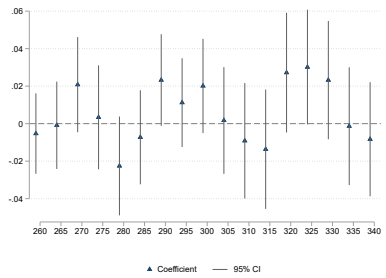
(b) Second Year Persist



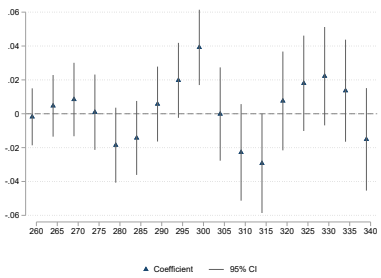
(c) Third Year Persist



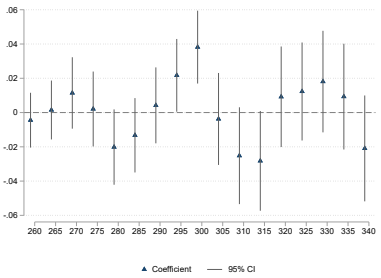
(d) 4-Year Grad



(e) In-State 4-Year Grad

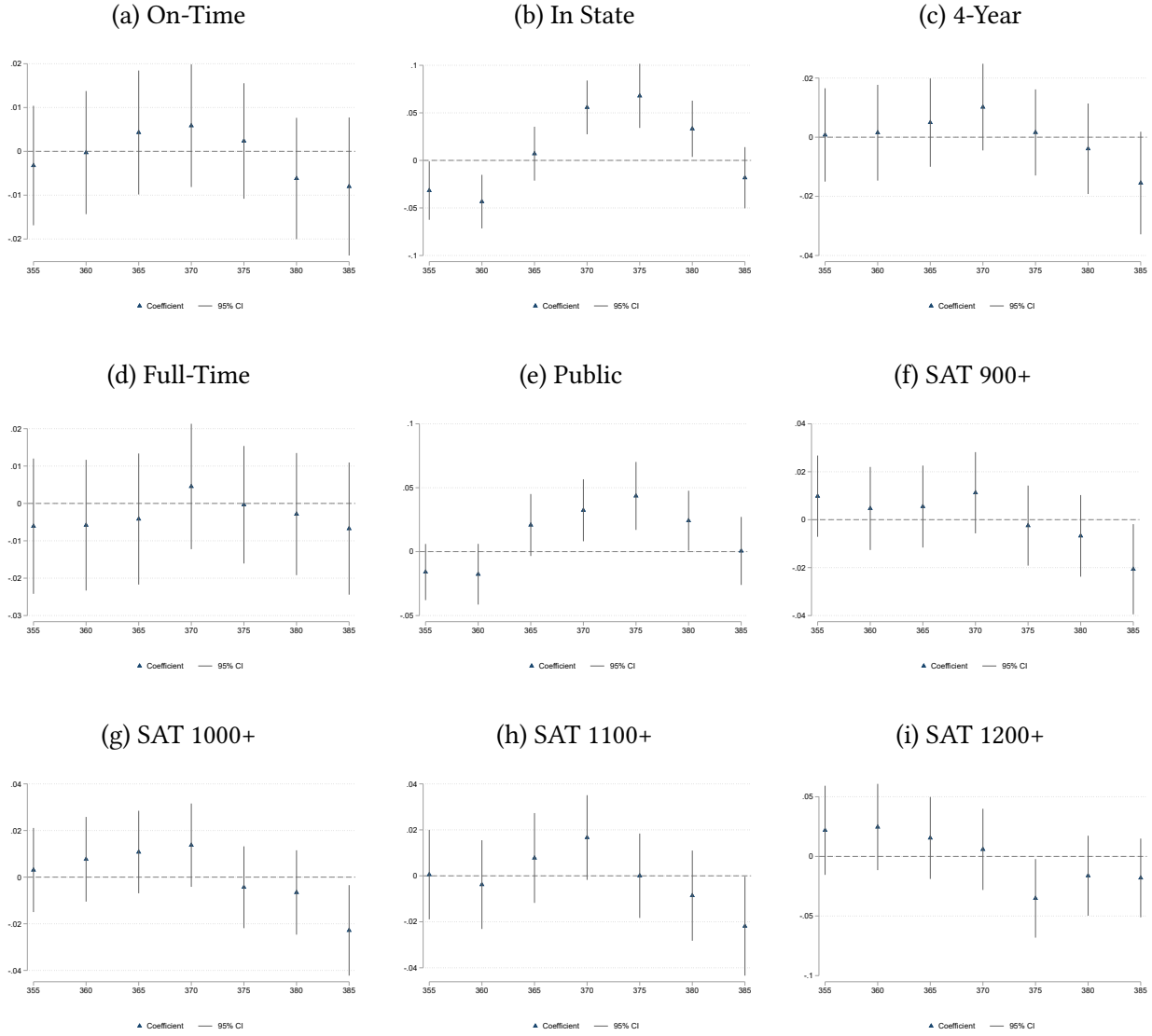


(f) In-State Public 4-Year Grad



Source: National Student Clearinghouse.
Note: Each figure displays random cutoff falsification tests for college persistence and completion outcomes. Each figure presents point estimates and 95 percent confidence intervals on each cutoff; "300" denotes the actual cutoff of 3.0. The regression discontinuity bandwidth is set to the optimal calculation of 0.3. The sample includes high school graduates who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects.

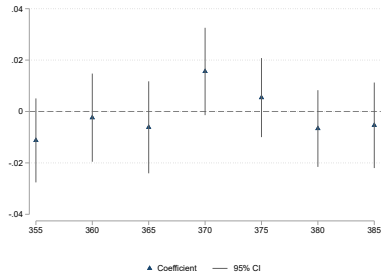
Figure A21: Zell Miller Scholarship Random Cutoff Trial for College Enrollment Outcomes



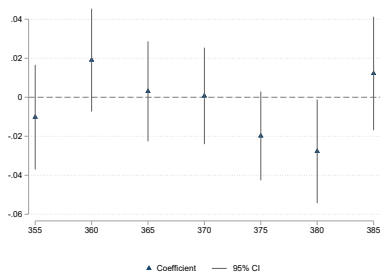
Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.
Note: Each figure displays random cutoff falsification tests for college enrollment outcomes. Each figure presents point estimates and 95 percent confidence intervals on each cutoff; "370" denotes the actual cutoff of 3.7. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects.

Figure A22: Zell Miller Scholarship Random Cutoff Trial for College Persistence and Completion Outcomes

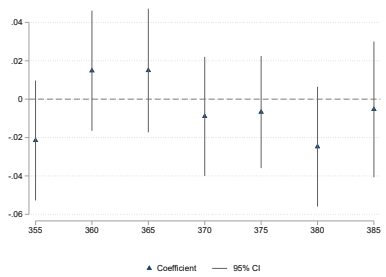
(a) Second Semester Persist



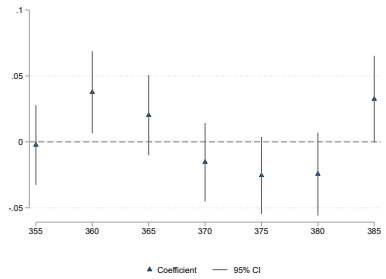
(b) Second Year Persist



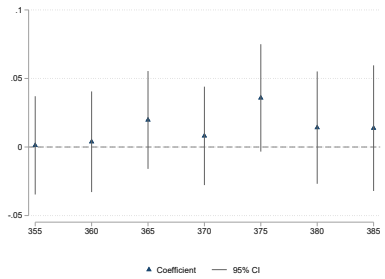
(c) Third Year Persist



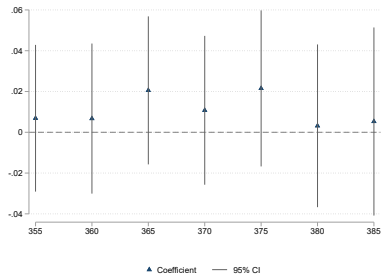
(d) 4-Year Graduate



(e) In-State 4-Year Grad



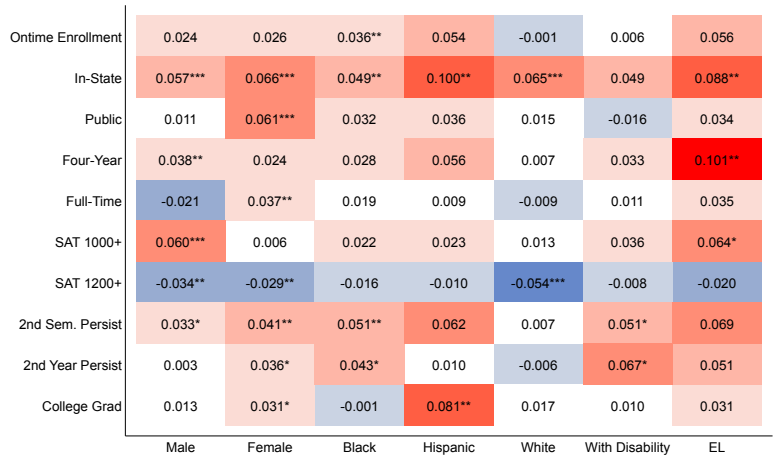
(f) In-State Public 4-Year Grad



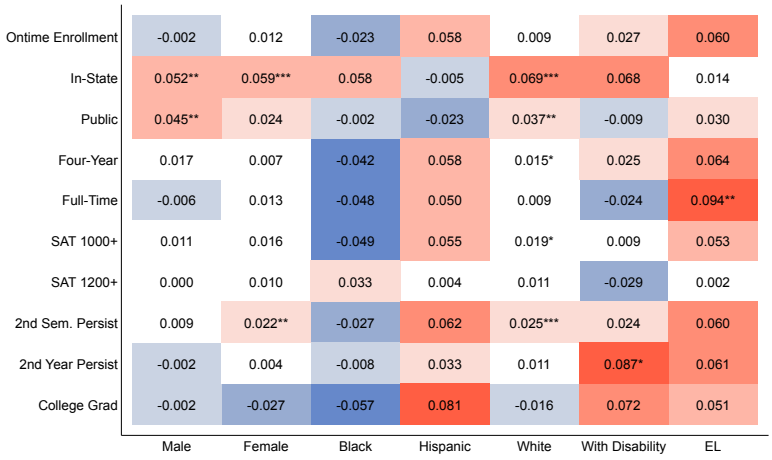
Source: National Student Clearinghouse.
Note: Each figure displays random cutoff falsification tests for college persistence and completion outcomes. Each figure presents point estimates and 95 percent confidence intervals on each cutoff; "370" denotes the actual cutoff of 3.7. The sample includes high school graduates who resided in Georgia for at least 12 consecutive months before enrolling in college and who met the academic rigor requirements. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects.

Figure A23: Scholarship Impacts on College Outcomes by Student Demographics

(a) HOPE



(b) Zell Miller



Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.
Note: The heatmap displays college enrollment, persistence, and completion outcomes by student demographic characteristics. The sample consists of high school graduates who lived in Georgia for at least 12 consecutive months before college enrollment and met academic rigor requirements. Each cell represents a separate regression that includes high school-by-cohort fixed effects. The regression discontinuity bandwidth is set to the optimal calculation of 0.3 for HOPE and 0.25 for Zell. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

Table A1: Scholarship Impacts on College Enrollment from Predicted High School Graduation Date

	HOPE (GPA $\geq$ 3.0)	Zell Miller (GPA $\geq$ 3.7)
Panel A. All Students		
Enroll College Within 16 Months	0.026**	0.005
From Predicted HS Grad Date	(0.011)	(0.007)
$\bar{Y}$	0.821	0.941
Panel B. FRPM Students		
Enroll College Within 16 Months	0.054***	0.029
From Predicted HS Grad Date	(0.018)	(0.024)
$\bar{Y}$	0.739	0.884
Panel C. Non-FRPM Students		
Enroll College Within 16 Months	0.005	0.000
From Predicted HS Grad Date	(0.011)	(0.007)
$\bar{Y}$	0.904	0.955

Source: National Student Clearinghouse.

Note: The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months prior to college enrollment and met the academic rigor requirements. College enrollment within 16 months is defined relative to the predicted high school graduation date, which is assumed to be June 30, four years after the student's enrollment in ninth grade. The regression discontinuity bandwidths are set to the optimal values of 0.30 for HOPE and 0.25 for Zell, based on the on-time college enrollment outcome. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Each column represents a separate regression. $\bar{Y}$ denotes the control mean. Heteroskedasticity-robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table A2: Scholarship Impacts on College Enrollment by Timing Post High School Graduation

	HOPE (GPA $\geq$ 3.0)	Zell Miller (GPA $\geq$ 3.7)
Panel A. All Students		
Within 6 Months Post HS Grad	0.046***	0.012
	(0.011)	(0.008)
$\bar{Y}$	0.713	0.904
Within 12 Months Post HS Grad	0.026***	0.005
	(0.010)	(0.007)
$\bar{Y}$	0.766	0.923
Within 16 Months Post HS Grad	0.027***	0.006
	(0.010)	(0.007)
$\bar{Y}$	0.798	0.933
Anytime Post HS Grad	0.023***	0.005
	(0.009)	(0.006)
$\bar{Y}$	0.836	0.946
Panel B. FRPM Students		
Within 6 Months Post HS Grad	0.085***	0.041
	(0.019)	(0.026)
$\bar{Y}$	0.591	0.811
Within 12 Months Post HS Grad	0.059***	0.027
	(0.018)	(0.024)
$\bar{Y}$	0.657	0.852
Within 16 Months Post HS Grad	0.063***	0.032
	(0.018)	(0.023)
$\bar{Y}$	0.697	0.871
Anytime Post HS Grad	0.048***	0.019
	(0.017)	(0.021)
$\bar{Y}$	0.751	0.894
Panel C. Non-FRPM Students		
Within 6 Months Post HS Grad	0.016	0.004
	(0.013)	(0.008)
$\bar{Y}$	0.824	0.929
Within 12 Months Post HS Grad	0.001	0.000
	(0.011)	(0.007)
$\bar{Y}$	0.865	0.942
Within 16 Months Post HS Grad	0.000	-0.000
	(0.010)	(0.007)
$\bar{Y}$	0.889	0.949
Anytime Post HS Grad	0.004	0.003
	(0.009)	(0.006)
$\bar{Y}$	0.913	0.960

Source: National Student Clearinghouse.

Note: The sample includes high school graduates from the 2012–2023 cohorts who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. The regression discontinuity bandwidth is set to the optimal calculation of 0.3 for HOPE and 0.25 for Zell based on the on-time college enrollment outcome variable. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Each column represents a separate regression. $\bar{Y}$ denotes the control mean. Heteroskedasticity-robust standard errors are in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table A3: Impacts of Scholarship Eligibility on College Enrollment Intensity by Ever-FRPM Status

	HOPE (GPA $\geq$ 3.0)		Zell Miller (GPA $\geq$ 3.7)	
	(1) Full-Time	(2) Part-Time	(3) Full-Time	(4) Part-Time
Panel A. All Students				
GPA $\geq$ Cutoff	0.028**	-0.004	0.004	0.002
	(0.012)	(0.008)	(0.009)	(0.006)
$\bar{Y}$	0.675	0.157	0.883	0.062
N	21,255	21,255	17,721	17,721
Panel B. FRPM Students				
GPA $\geq$ Cutoff	0.046**	0.001	0.032	-0.015
	(0.021)	(0.013)	(0.028)	(0.021)
$\bar{Y}$	0.569	0.177	0.803	0.089
N	8,581	8,581	3,141	3,141
Panel C. Non-FRPM Students				
GPA $\geq$ Cutoff	0.013	-0.008	-0.003	0.006
	(0.013)	(0.010)	(0.009)	(0.007)
$\bar{Y}$	0.772	0.139	0.904	0.055
N	12,630	12,630	14,570	14,570

Source: National Student Clearinghouse.

Note: The sample includes high school graduates from the 2012–2023 cohorts who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. In the NSC data, 11.47% in enrollment intensity (full-time, three-quarter-time, half-time, or less than half-time) is missing, resulting in a smaller sample size for analyses involving full-time college enrollment. The regression discontinuity bandwidth is set to the optimal calculation of 0.3 for HOPE and 0.25 for Zell based on the on-time college enrollment outcome variable. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Each column represents a separate regression. $\bar{Y}$ denotes the control mean. Standard errors are clustered at the HOPE GPA level, as shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table A4: Impacts of HOPE Scholarship on In-State/Out-of-State College Choice by Selectivity by Ever-FRPM Status

	SAT 900+		SAT 1000+		SAT 1100+		SAT 1200+		Selective	
	(1) In State	(2) Out of State	(3) In State	(4) Out of State	(5) In State	(6) Out of State	(7) In State	(8) Out of State	(9) In State	(10) Out of State
Panel A. All Students										
GPA $\geq$ 3.0	0.074***	-0.040***	0.073***	-0.039***	0.069***	-0.032***	-0.007*	-0.025***	-0.007*	-0.009
	(0.015)	(0.011)	(0.014)	(0.011)	(0.015)	(0.011)	(0.004)	(0.008)	(0.004)	(0.006)
$\bar{Y}$	0.411	0.210	0.371	0.188	0.326	0.161	0.020	0.078	0.006	0.035
R-Squared	0.061	0.086	0.087	0.102	0.109	0.113	0.049	0.083	0.064	0.049
Panel B. FRPM Students										
GPA $\geq$ 3.0	0.077***	-0.023	0.071***	-0.017	0.067***	-0.014	0.008	-0.006	0.005	-0.002
	(0.024)	(0.016)	(0.021)	(0.014)	(0.021)	(0.011)	(0.005)	(0.006)	(0.004)	(0.005)
$\bar{Y}$	0.347	0.126	0.279	0.091	0.223	0.063	0.021	0.023	0.002	0.008
R-Squared	0.094	0.055	0.125	0.058	0.143	0.062	0.034	0.058	0.046	0.049
Panel C. Non-FRPM Students										
GPA $\geq$ 3.0	0.073***	-0.055***	0.073***	-0.057***	0.071***	-0.048***	-0.017***	-0.040***	-0.012**	-0.015
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.017)	(0.006)	(0.014)	(0.005)	(0.010)
$\bar{Y}$	0.469	0.286	0.455	0.276	0.420	0.250	0.019	0.128	0.010	0.059
R-Squared	0.045	0.059	0.049	0.061	0.059	0.066	0.073	0.052	0.076	0.036

Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.

Note: The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months prior to enrolling in college and met the academic rigor requirements. The regression discontinuity bandwidth is set to the optimal calculation of 0.3 based on the on-time college enrollment outcome variable. Selective colleges are colleges rated "Very Competitive Plus" or above in Barron's college selectivity classifications. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Each column represents a separate regression. $\bar{Y}$ denotes the control mean. Standard errors are clustered at the HOPE GPA level presented in the parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table A5: Impacts of Scholarships on Two-Year College Completion Within 3 Years, by Ever-FRPM Status

	(1) HOPE (GPA $\geq$ 3.0)	(2) Zell Miller (GPA $\geq$ 3.7)
Panel A. All Students		
Two-Year Grad Within 3 Years	-0.008**	0.002
	(0.004)	(0.002)
$\bar{Y}$	0.019	0.009
N	18,594	14,071
Panel B. FRPM Students		
Two-Year Grad Within 3 Years	-0.012*	0.010
	(0.006)	(0.012)
$\bar{Y}$	0.025	0.019
N	7,421	2,397
Panel C. Non-FRPM Students		
Two-Year Grad Within 3 Years	-0.005	0.001
	(0.004)	(0.002)
$\bar{Y}$	0.014	0.007
N	11,169	11,659

Source: National Student Clearinghouse.

Note: The sample includes high school graduates from the 2012–2021 cohorts who resided in Georgia for at least 12 consecutive months prior to enrolling in college and met the academic rigor requirements. Each column represents a separate regression. The regression discontinuity bandwidth is set to the optimal calculation (0.3 for HOPE, 0.25 for Zell Miller) based on the on-time college enrollment outcome variable. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. $\bar{Y}$ denotes the control mean. Standard errors are clustered at the HOPE GPA level and presented in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table A6: Top College Destinations by Zell Miller Eligibility Status

Zell-Eligible			Zell-Ineligible		
College	*N*	%	College	*N*	%
University of Georgia	2,399	35.1	University of Georgia	1,705	25.7
Georgia Institute of Technology	1,556	22.8	Georgia State University	918	13.9
Georgia State University	488	7.1	Kennesaw State University	768	11.6
Kennesaw State University	392	5.7	Georgia Institute of Technology	321	4.8
Emory University	145	2.1	Georgia College & State University	321	4.8
Auburn University	138	2.0	Georgia Southern University	238	3.6
Georgia College & State University	134	2.0	Auburn University	223	3.5
Georgia State University - Decatur	97	1.5	Georgia State University - Decatur	213	3.3
University of Alabama at Tuscaloosa	94	1.5	University of North Georgia	183	2.9

Note: The table reports the most frequent college destinations for Zell-eligible and ineligible students around the Zell cutoff of 3.7. Percentages are shares of each group's total enrollment at the margin.

Table A7: Alternative Specifications for HOPE Scholarship Impacts on College Enrollment

	On-Time	GA College	Full-Time	Four-Year	Public	SAT 900+	SAT 1000+	SAT 1100+	SAT 1200+
All Students									
Donut	0.035***	0.069***	0.034**	0.044**	0.045***	0.044***	0.042***	0.048***	-0.031***
	(0.010)	(0.014)	(0.012)	(0.011)	(0.012)	(0.012)	(0.012)	(0.012)	(0.010)
Trends in Heaps	0.035***	0.070***	0.035**	0.045***	0.045***	0.044***	0.042***	0.047***	-0.030***
	(0.010)	(0.014)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.013)	(0.011)
No Controls	0.031***	0.062***	0.032**	0.038**	0.040***	0.040***	0.039***	0.042***	-0.029***
	(0.011)	(0.014)	(0.013)	(0.014)	(0.012)	(0.014)	(0.014)	(0.015)	(0.009)
Triangular	0.026**	0.071***	0.019	0.024	0.039***	0.031**	0.029**	0.032**	-0.034***
	(0.012)	(0.015)	(0.013)	(0.016)	(0.013)	(0.015)	(0.014)	(0.015)	(0.009)
FRPM Students									
Donut	0.073***	0.095***	0.057**	0.073***	0.058***	0.059***	0.057***	0.060***	0.002
	(0.018)	(0.022)	(0.021)	(0.021)	(0.020)	(0.021)	(0.021)	(0.021)	(0.009)
Trends in Heaps	0.073***	0.097***	0.056**	0.074***	0.058***	0.059***	0.058***	0.060***	0.002
	(0.018)	(0.022)	(0.021)	(0.021)	(0.020)	(0.021)	(0.022)	(0.021)	(0.010)
No Controls	0.068***	0.078***	0.051**	0.071***	0.055***	0.060***	0.058***	0.056***	0.002
	(0.018)	(0.025)	(0.021)	(0.021)	(0.018)	(0.020)	(0.021)	(0.020)	(0.008)
Triangular	0.067***	0.076***	0.037	0.052**	0.060***	0.049**	0.043**	0.042**	0.001
	(0.021)	(0.029)	(0.024)	(0.024)	(0.020)	(0.023)	(0.022)	(0.021)	(0.008)
Non-FRPM Students									
Donut	0.006	0.052***	0.018	0.023*	0.036***	0.031*	0.027*	0.035**	-0.054***
	(0.010)	(0.018)	(0.014)	(0.013)	(0.013)	(0.015)	(0.015)	(0.017)	(0.016)
Trends in Heaps	0.006	0.052***	0.017	0.023*	0.036***	0.030**	0.027*	0.034**	-0.054***
	(0.010)	(0.018)	(0.014)	(0.013)	(0.014)	(0.015)	(0.015)	(0.017)	(0.016)
No Controls	0.001	0.056***	0.013	0.009	0.029**	0.018	0.017	0.024	-0.056***
	(0.011)	(0.017)	(0.014)	(0.016)	(0.014)	(0.017)	(0.017)	(0.019)	(0.014)
Triangular	-0.006	0.064***	0.002	0.004	0.024*	0.016	0.018	0.022	-0.058***
	(0.011)	(0.018)	(0.014)	(0.018)	(0.014)	(0.018)	(0.017)	(0.020)	(0.015)

Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.
Note: The sample includes high school graduates from the 2012–2023 cohorts who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. "Donut" excludes students with a HOPE GPA exactly equal to 3.0, and "Trends in Heaps" controls for indicators for heaped GPA values and their interactions with a quadratic function of distance from the cutoff. All specifications other than "No Controls" control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table A8: Alternative Specifications for Zell Miller Scholarship Impacts on College Enrollment

	On-Time	GA College	Full-Time	Four-Year	Public	SAT 900+	SAT 1000+	SAT 1100+	SAT 1200+
All Students									
Donut	0.006	0.047***	0.001	0.011	0.029**	0.009	0.010	0.016	0.005
	(0.008)	(0.016)	(0.009)	(0.008)	(0.013)	(0.009)	(0.009)	(0.010)	(0.019)
No Controls	0.006	0.054***	0.004	0.011	0.032**	0.012	0.015	0.018*	0.007
	(0.007)	(0.015)	(0.008)	(0.007)	(0.013)	(0.009)	(0.009)	(0.010)	(0.018)
Triangular	0.005	0.057***	0.005	0.008	0.022	0.013	0.014	0.017	0.009
	(0.008)	(0.016)	(0.009)	(0.008)	(0.014)	(0.010)	(0.010)	(0.011)	(0.019)
FRPM Students									
Donut	0.023	0.060	0.018	0.003	0.074**	0.003	0.011	0.022	0.015
	(0.026)	(0.041)	(0.030)	(0.031)	(0.037)	(0.034)	(0.033)	(0.032)	(0.034)
No Controls	0.036	0.070*	0.035	0.015	0.077**	0.020	0.034	0.037	0.030
	(0.026)	(0.037)	(0.029)	(0.028)	(0.034)	(0.032)	(0.033)	(0.032)	(0.031)
Triangular	0.031	0.047	0.019	0.012	0.043	0.021	0.026	0.025	0.061*
	(0.029)	(0.040)	(0.031)	(0.032)	(0.040)	(0.036)	(0.037)	(0.035)	(0.033)
Non-FRPM Students									
Donut	0.001	0.047**	-0.005	0.011	0.019	0.009	0.009	0.012	0.002
	(0.008)	(0.018)	(0.010)	(0.008)	(0.015)	(0.009)	(0.010)	(0.010)	(0.020)
No Controls	-0.001	0.054***	-0.004	0.009	0.021	0.009	0.010	0.012	-0.001
	(0.007)	(0.017)	(0.009)	(0.007)	(0.014)	(0.008)	(0.009)	(0.009)	(0.019)
Triangular	-0.002	0.059***	0.000	0.006	0.014	0.011	0.011	0.013	-0.003
	(0.008)	(0.018)	(0.009)	(0.008)	(0.015)	(0.009)	(0.009)	(0.010)	(0.020)

Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.
Note: The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months prior to enrolling in college and met the academic rigor requirements. "Donut" excludes students with a HOPE GPA between 3.69 and 3.71. All specifications other than "No Controls" control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table A9: Alternative Specifications for HOPE Scholarship Impacts on College Persistence and Completion

	College Persistence			Bachelor's Degree Post HS Grad		
	Second Semester	Second Year	Third Year	Any 4-Year	In-State 4-Year	In-State Public 4-Year
All Students						
Donut	0.050***	0.034**	0.010	0.021	0.038***	0.035***
	(0.011)	(0.015)	(0.016)	(0.015)	(0.013)	(0.012)
Trends in Heaps	0.050***	0.034**	0.011	0.020	0.038***	0.036***
	(0.011)	(0.015)	(0.016)	(0.015)	(0.013)	(0.012)
No Controls	0.041***	0.023	0.007	0.020	0.038***	0.037***
	(0.015)	(0.017)	(0.015)	(0.013)	(0.011)	(0.011)
Triangular	0.034*	0.020	0.006	0.021	0.040***	0.038***
	(0.017)	(0.017)	(0.015)	(0.013)	(0.011)	(0.011)
FRPM Students						
Donut	0.090***	0.067***	0.026	0.003	0.043**	0.036**
	(0.021)	(0.024)	(0.026)	(0.021)	(0.020)	(0.018)
Trends in Heaps	0.091***	0.067***	0.025	0.002	0.042**	0.035*
	(0.021)	(0.023)	(0.026)	(0.021)	(0.020)	(0.018)
No Controls	0.082***	0.054***	0.019	0.009	0.043***	0.039**
	(0.022)	(0.024)	(0.024)	(0.018)	(0.017)	(0.016)
Triangular	0.074***	0.051**	0.018	0.010	0.043***	0.037**
	(0.027)	(0.024)	(0.024)	(0.018)	(0.017)	(0.016)
Non-FRPM Students						
Donut	0.020	0.007	0.000	0.031	0.036**	0.037**
	(0.013)	(0.019)	(0.022)	(0.020)	(0.018)	(0.017)
Trends in Heaps	0.020	0.007	0.000	0.031	0.037**	0.037**
	(0.013)	(0.019)	(0.022)	(0.020)	(0.018)	(0.017)
No Controls	0.010	-0.005	-0.002	0.025	0.036**	0.037**
	(0.015)	(0.019)	(0.020)	(0.018)	(0.015)	(0.015)
Triangular	0.005	-0.004	-0.001	0.028	0.038**	0.039**
	(0.016)	(0.019)	(0.020)	(0.018)	(0.016)	(0.015)

Source: National Student Clearinghouse.

Note: The sample includes high school graduates who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. "Donut" excludes students with a HOPE GPA exactly equal to 3.0, and "Trends in Heaps" controls for indicators for heaped GPA values and their interactions with a quadratic function of distance from the cutoff. All specifications other than "No Controls" control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table A10: Alternative Specifications for Zell Miller Scholarship Impacts on College Persistence and Completion

	College Persistence			Bachelor's Degree Post HS Grad		
	Second Semester	Second Year	Third Year	Any 4-Year	In-State 4-Year	In-State Public 4-Year
All Students						
Donut	0.018*	0.003	-0.002	-0.002	0.006	0.011
	(0.010)	(0.013)	(0.017)	(0.017)	(0.020)	(0.021)
No Controls	0.016*	0.001	-0.009	-0.016	0.007	0.009
	(0.008)	(0.013)	(0.016)	(0.015)	(0.018)	(0.019)
Triangular	0.017*	0.003	-0.019	-0.021	0.002	0.009
	(0.009)	(0.014)	(0.017)	(0.016)	(0.019)	(0.019)
FRPM Students						
Donut	0.027	0.018	0.050	0.018	0.049	0.072
	(0.027)	(0.037)	(0.045)	(0.050)	(0.055)	(0.055)
No Controls	0.032	0.024	0.053	0.009	0.050	0.060
	(0.026)	(0.034)	(0.040)	(0.044)	(0.053)	(0.050)
Triangular	0.017	0.056	0.068*	0.031	0.037	0.047
	(0.028)	(0.036)	(0.041)	(0.047)	(0.056)	(0.053)
Non-FRPM Students						
Donut	0.015	-0.001	-0.011	-0.003	0.001	0.002
	(0.009)	(0.014)	(0.018)	(0.018)	(0.021)	(0.022)
No Controls	0.011	-0.003	-0.021	-0.019	-0.001	-0.002
	(0.008)	(0.014)	(0.017)	(0.016)	(0.020)	(0.020)
Triangular	0.016*	-0.007	-0.033*	-0.026	-0.004	-0.002
	(0.009)	(0.015)	(0.018)	(0.017)	(0.022)	(0.022)

Source: National Student Clearinghouse.

Note: The sample includes high school graduates who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. "Donut" excludes students with a HOPE GPA between 3.69 and 3.71. All specifications other than "No Controls" control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table A11: Effects of Zell Miller Scholarship Eligibility on College Outcomes by Measures of Socioeconomic Status

	Non-FRPM	By FRPM Measures			By HS Poverty		
	(1)	(2) Ever	(3) Persistently	(4) Only Free	(5) High	(6) Medium	(7) Low
Enrollment	-0.001	0.032	0.053*	0.026	-0.004	0.011	0.004
	(0.006)	(0.026)	(0.030)	(0.028)	(0.039)	(0.012)	(0.008)
In-State	0.056***	0.064*	0.072*	0.065	0.052	0.041*	0.066***
	(0.016)	(0.036)	(0.041)	(0.040)	(0.055)	(0.022)	(0.021)
Full-Time	-0.003	0.032	0.069**	0.031	0.009	-0.005	0.008
	(0.009)	(0.028)	(0.034)	(0.031)	(0.042)	(0.015)	(0.010)
4-Year	0.010	0.018	0.022	0.004	-0.008	0.011	0.013
	(0.007)	(0.029)	(0.033)	(0.030)	(0.039)	(0.014)	(0.009)
Public	0.022*	0.071**	0.095**	0.061*	-0.009	0.055***	0.025
	(0.013)	(0.034)	(0.038)	(0.036)	(0.052)	(0.020)	(0.016)
SAT 900+	0.011	0.016	0.021	0.009	-0.017	0.018	0.013
	(0.008)	(0.032)	(0.037)	(0.033)	(0.044)	(0.016)	(0.010)
SAT 1000+	0.011	0.029	0.053	0.028	0.012	0.018	0.013
	(0.008)	(0.033)	(0.038)	(0.034)	(0.051)	(0.016)	(0.010)
SAT 1100+	0.013	0.032	0.025	0.018	0.057	0.017	0.012
	(0.009)	(0.031)	(0.037)	(0.033)	(0.052)	(0.017)	(0.010)
SAT 1200+	0.001	0.029	-0.003	0.015	0.044	0.004	-0.000
	(0.018)	(0.031)	(0.037)	(0.032)	(0.043)	(0.025)	(0.022)
2nd Sem. Persist	0.013	0.027	0.061**	0.029	0.015	0.022	0.012
	(0.008)	(0.025)	(0.031)	(0.028)	(0.040)	(0.014)	(0.010)
2nd Year Persist	-0.003	0.023	0.061	0.015	0.031	0.002	-0.002
	(0.013)	(0.034)	(0.042)	(0.037)	(0.052)	(0.021)	(0.017)
3rd Year Persist	-0.020	0.053	0.071	0.027	0.006	-0.000	-0.015
	(0.017)	(0.040)	(0.049)	(0.044)	(0.060)	(0.027)	(0.021)
Any	-0.018	0.019	0.050	0.029	-0.047	0.029	-0.038*
4-Year Grad	(0.016)	(0.046)	(0.052)	(0.049)	(0.063)	(0.029)	(0.020)
In-State	0.001	0.061	0.034	0.048	-0.030	0.030	0.001
4-Year Grad	(0.020)	(0.053)	(0.061)	(0.058)	(0.070)	(0.032)	(0.024)
In-State Public	-0.000	0.069	0.050	0.055	-0.042	0.034	0.003
4-Year Grad	(0.020)	(0.051)	(0.058)	(0.054)	(0.067)	(0.033)	(0.024)
N	14,783	3,216	2,472	2,812	1,494	6,247	10,267

Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.
Note: The sample includes high school graduates from the 2012–2023 cohorts who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. The regression discontinuity bandwidth is set to the optimal calculation of 0.25 based on the on-time college enrollment outcome variable. All specifications control for student demographics (sex, race/ethnicity, English Learner status, and disability status for all Columns, plus ever FRPM eligibility for Columns 5-7) and include high school-by-cohort fixed effects. Each column represents a separate regression. Standard errors are clustered at the HOPE GPA level presented in the parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table A12: Impacts of HOPE Scholarship on College Choice by Tuition Level and Ever-FRPM Status

	All Institutions			In-State Institutions		
	(1) $\geq$ 25th	(2) $\geq$ 50th	(3) $\geq$ 75th	(4) $\geq$ 25th	(5) $\geq$ 50th	(6) $\geq$ 75th
Panel A. All Students						
GPA $\geq$ 3.0	-0.015	-0.046***	-0.035***	0.071***	0.003	-0.002
	(0.014)	(0.014)	(0.012)	(0.015)	(0.008)	(0.006)
$\bar{Y}$	0.410	0.325	0.205	0.507	0.068	0.046
N	18,503	18,503	18,503	18,503	18,503	18,503
Panel B. FRPM Students						
GPA $\geq$ 3.0	0.002	-0.044*	-0.025	0.073***	0.013	0.001
	(0.023)	(0.022)	(0.016)	(0.028)	(0.013)	(0.012)
$\bar{Y}$	0.339	0.254	0.121	0.504	0.069	0.050
N	6,785	6,785	6,785	6,785	6,785	6,785
Panel C. Non-FRPM Students						
GPA $\geq$ 3.0	-0.029	-0.050***	-0.043**	0.073***	-0.002	-0.004
	(0.018)	(0.018)	(0.016)	(0.018)	(0.011)	(0.008)
$\bar{Y}$	0.463	0.379	0.269	0.508	0.068	0.044
N	11,712	11,712	11,712	11,712	11,712	11,712

Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.

Note: Outcomes in Columns 1–3 are indicators for enrolling at an institution with sticker tuition and fees at or above the 25th, 50th, and 75th percentiles of the annual IPEDS distribution across all institutions, and Columns 4–6 use the distribution across Georgia institutions only. The sample includes high school graduates from the 2012–2023 cohorts who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. The sample size is smaller than for the college enrollment outcome because IPEDS data are missing tuition and fee information for some colleges. The regression discontinuity bandwidth is set to the optimal bandwidth of 0.3 based on the on-time college enrollment outcome. All specifications control for student demographics (sex, race/ethnicity, ever eligible for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Each column represents a separate regression. $\bar{Y}$ denotes the control mean. Standard errors are clustered at the HOPE GPA level and are reported in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table A13: Impacts of the Zell Miller Scholarship Eligibility on College Choice by Tuition Level and Ever-FRPM Status

	All Institutions			In-State Institutions		
	(1) $\geq$ 25th	(2) $\geq$ 50th	(3) $\geq$ 75th	(4) $\geq$ 25th	(5) $\geq$ 50th	(6) $\geq$ 75th
Panel A. All Students						
GPA $\geq$ 3.7	-0.005	-0.056***	-0.045***	0.058***	0.044**	-0.002
	(0.013)	(0.014)	(0.014)	(0.015)	(0.017)	(0.006)
$\bar{Y}$	0.721	0.400	0.328	0.601	0.322	0.054
N	17,013	17,013	17,013	17,013	17,013	17,013
Panel B. FRPM Students						
GPA $\geq$ 3.7	0.013	-0.083**	-0.060*	0.045	0.047	-0.025
	(0.034)	(0.037)	(0.035)	(0.038)	(0.034)	(0.021)
$\bar{Y}$	0.526	0.303	0.217	0.679	0.221	0.081
N	2,884	2,884	2,884	2,884	2,884	2,884
Panel C. Non-FRPM Students						
GPA $\geq$ 3.7	-0.010	-0.051***	-0.042**	0.062***	0.043**	0.004
	(0.013)	(0.017)	(0.017)	(0.017)	(0.018)	(0.007)
$\bar{Y}$	0.769	0.424	0.356	0.582	0.347	0.047
N	14,119	14,119	14,119	14,119	14,119	14,119

Source: National Student Clearinghouse and Integrated Postsecondary Education Data System.

Note: Outcomes in Columns 1–3 are indicators for enrolling at an institution with sticker tuition and fees at or above the 25th, 50th, and 75th percentiles of the annual IPEDS distribution across all institutions, and Columns 4–6 use the distribution across Georgia institutions only. The sample includes high school graduates from the 2012–2023 cohorts who lived in Georgia for at least 12 consecutive months before enrolling in college and met the academic rigor requirements. The sample size is smaller than for the college enrollment outcome because IPEDS data are missing tuition and fee information for some colleges. The regression discontinuity bandwidth is set to the optimal calculation of 0.25 based on the on-time college enrollment outcome variable. All specifications control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Each column represents a separate regression. $\bar{Y}$ denotes the control mean. Standard errors are clustered at the HOPE GPA level, as shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

B Details for HOPE and Zell Miller Scholarships

This appendix provides a comprehensive overview of the eligibility requirements and award structures for the HOPE and Zell Miller Scholarships. Both programs are restricted to students enrolled in institutions within the University System of Georgia (USG), the Technical College System of Georgia (TCSG), and eligible in-state private postsecondary institutions as defined by the Georgia Student Finance Commission (GSFC).

Eligibility and Residency

Both scholarships require Georgia residency; students must have resided in Georgia for at least 12 consecutive months prior to college enrollment and must graduate from an eligible Georgia high school. Initial academic eligibility is determined by the High School HOPE GPA and the completion of a rigorous curriculum. As summarized in Table B1, the HOPE Scholarship requires a minimum high school HOPE GPA of 3.0. The Zell Miller Scholarship carries more stringent requirements, including a minimum 3.7 HOPE GPA and a qualifying standardized test score (at least 1200 SAT Math/ERW or 26 ACT). Neither program imposes an income requirement; both operate as purely merit-based forms of financial aid.

Rigor Requirement

Starting with the graduating class of 2016, Georgia implemented a rigor requirement to discourage students from selecting easier coursework to inflate their HOPE GPA. Seniors graduating after May 2016 were required to complete at least 3 credits in advanced academic courses; those graduating after May 2017 were required to complete at least 4 credits. Eligible rigor courses include AP, IB, and dual enrollment courses, as well as designated advanced courses in core subjects.[21]

Maintenance Requirements

Continued receipt of both scholarships depends on satisfactory academic progress. HOPE recipients must maintain a cumulative college GPA of at least 3.0, while Zell Miller recipients must maintain a cumulative GPA of at least 3.3. Compliance is evaluated at credit-hour checkpoints of 30, 60, and 90 attempted hours and at the conclusion of each spring semester. Students who fall below the Zell Miller maintenance threshold but remain above 3.0 may revert to HOPE funding. While scholarships can be lost at these checkpoints, students may regain eligibility at subsequent 30-hour intervals if their GPA returns to the required level (Ribar and Rubenstein, 2021). Eligibility for both programs expires after a fixed time window: students who first received either scholarship between summer 2011 and spring 2019 faced a seven-year limit, while those who first received either scholarship in summer 2019 or later face a ten-year limit.

[21] The full list of rigor courses as of school year 2024–25 is available at: https://www.gafutures.org/media/apofcfmn/rigor-list-september-2025.pdf.

Table B1: Eligibility and Maintenance Requirements: HOPE vs. Zell Miller

Requirement	**HOPE Scholarship**	**Zell Miller Scholarship**
GA Residency	12 months prior to enrollment	12 months prior to enrollment
HOPE GPA	Minimum 3.0	Minimum 3.7
Standardized Test	None required	1200 SAT (ERW + Math) or 26 ACT
Academic Rigor	4 credits from approved rigor list (3 credits for the class of 2016)	4 credits from approved rigor list (3 credits for the class of 2016)
Maintenance GPA	Minimum 3.0 college GPA	Minimum 3.3 college GPA
Checkpoints	End of Spring; 30, 60, 90 attempted hours	End of Spring; 30, 60, 90 attempted hours

Source: Georgia Student Finance Commission (GSFC).

Award Structure

Both scholarships are applied as first-dollar awards, covering tuition before other grants or scholarships, and both exclude mandatory fees from coverage. Award amounts scale with credit hours and vary significantly by institutional type. At USG institutions, award amounts are institution-specific. The HOPE Scholarship typically covers 95 to 100 percent of tuition for students enrolled in 15 credit hours, whereas the Zell Miller Scholarship covers 100 percent of tuition regardless of credit-hour load. In contrast, for TCSG and private institutions, both programs provide fixed dollar awards that scale with enrollment intensity but are uniform across all participating schools. For students at private institutions such as Emory University, both awards represent only a small fraction of total tuition costs.

The difference between the two awards varies by institution. Currently, 12 of the 30 USG institutions maintain distinct award tiers for the two programs. For a student enrolled in 12 credit hours, this disparity ranges from a minimum of $24 to a maximum of $1,051.20 per semester, with a system-wide average difference of $173 per semester. Detailed breakdowns of award amounts by institution and credit-hour load are provided in Table B2 and Table B3.

Table B2: HOPE Scholarship Award Amounts for Fiscal Year 2026 (6+ Credit Hours)

	Rate	6	7	8	9	10	11	12	13	14	15
University System of Georgia											
Abraham Baldwin Agricultural College	109.00	654.00	763.00	872.00	981.00	1090.00	1199.00	1308.00	1417.00	1526.00	1635.00
Albany State University (4-Year)	174.00	1044.00	1218.00	1392.00	1566.00	1740.00	1914.00	2088.00	2262.00	2436.00	2610.00
Albany State University (2-Year)	111.00	666.00	777.00	888.00	999.00	1110.00	1221.00	1332.00	1443.00	1554.00	1665.00
Atlanta Metropolitan State College	107.00	642.00	749.00	856.00	963.00	1070.00	1177.00	1284.00	1391.00	1498.00	1605.00
Augusta University (Health Sciences)	303.00	1818.00	2121.00	2424.00	2727.00	3030.00	3333.00	3636.00	3939.00	4242.00	4545.00
Augusta University (Summerville)	235.00	1410.00	1645.00	1880.00	2115.00	2350.00	2585.00	2820.00	3055.00	3290.00	3525.00
Clayton State University	174.00	1044.00	1218.00	1392.00	1566.00	1740.00	1914.00	2088.00	2262.00	2436.00	2610.00
College of Coastal Georgia	109.00	654.00	763.00	872.00	981.00	1090.00	1199.00	1308.00	1417.00	1526.00	1635.00
Columbus State University	187.00	1122.00	1309.00	1496.00	1683.00	1870.00	2057.00	2244.00	2431.00	2618.00	2805.00
Dalton State College	109.00	654.00	763.00	872.00	981.00	1090.00	1199.00	1308.00	1417.00	1526.00	1635.00
East Georgia State College	101.00	606.00	707.00	808.00	909.00	1010.00	1111.00	1212.00	1313.00	1414.00	1515.00
Fort Valley State University	174.00	1044.00	1218.00	1392.00	1566.00	1740.00	1914.00	2088.00	2262.00	2436.00	2610.00
Georgia College and State University	256.54	1539.24	1795.78	2052.32	2308.86	2565.40	2821.94	3078.48	3335.02	3591.56	3848.00
Georgia Gwinnett College	137.00	822.00	959.00	1096.00	1233.00	1370.00	1507.00	1644.00	1781.00	1918.00	2055.00
Georgia Highlands College	101.00	606.00	707.00	808.00	909.00	1010.00	1111.00	1212.00	1313.00	1414.00	1515.00
Georgia Institute of Technology	350.40	2102.40	2452.80	2803.20	3153.60	3504.00	3854.40	4204.80	4555.20	4905.60	5256.00
Georgia Southern University	187.00	1122.00	1309.00	1496.00	1683.00	1870.00	2057.00	2244.00	2431.00	2618.00	2805.00
Georgia Southwestern State University	174.00	1044.00	1218.00	1392.00	1566.00	1740.00	1914.00	2088.00	2262.00	2436.00	2610.00
Georgia State University	306.00	1836.00	2142.00	2448.00	2754.00	3060.00	3366.00	3672.00	3978.00	4284.00	4590.00
Georgia State University - Perimeter College	101.00	606.00	707.00	808.00	909.00	1010.00	1111.00	1212.00	1313.00	1414.00	1515.00
Gordon State College	109.00	654.00	763.00	872.00	981.00	1090.00	1199.00	1308.00	1417.00	1526.00	1635.00
Kennesaw State University	190.00	1140.00	1330.00	1520.00	1710.00	1900.00	2090.00	2280.00	2470.00	2660.00	2850.00
Middle Georgia State University	174.00	1044.00	1218.00	1392.00	1566.00	1740.00	1914.00	2088.00	2262.00	2436.00	2610.00
Savannah State University	174.00	1044.00	1218.00	1392.00	1566.00	1740.00	1914.00	2088.00	2262.00	2436.00	2610.00
South Georgia State College	101.00	606.00	707.00	808.00	909.00	1010.00	1111.00	1212.00	1313.00	1414.00	1515.00
University of Georgia	334.47	2006.82	2341.29	2675.76	3010.23	3344.70	3679.17	4013.64	4348.11	4682.58	5017.00
University of North Georgia (Four Year Degree)	191.00	1146.00	1337.00	1528.00	1719.00	1910.00	2101.00	2292.00	2483.00	2674.00	2865.00
University of North Georgia (Two Year Degree)	119.00	714.00	833.00	952.00	1071.00	1190.00	1309.00	1428.00	1547.00	1666.00	1785.00
University of West Georgia	187.00	1122.00	1309.00	1496.00	1683.00	1870.00	2057.00	2244.00	2431.00	2618.00	2805.00
Valdosta State University	187.00	1122.00	1309.00	1496.00	1683.00	1870.00	2057.00	2244.00	2431.00	2618.00	2805.00
Technical College System of Georgia											
All TCSG Institutions	107.00	642.00	749.00	856.00	963.00	1070.00	1177.00	1284.00	1391.00	1498.00	1605.00
Eligible Private Postsecondary Institutions											
Semester	N/A	1493.00	1493.00	1493.00	1493.00	1493.00	1493.00	2985.00	2985.00	2985.00	2985.00
Quarter	N/A	1017.00	1017.00	1017.00	1017.00	1017.00	1017.00	2034.00	2034.00	2034.00	2034.00

Source: Georgia Student Finance Commission.
Note: Award amounts at private institutions may vary during the term a student reaches the paid or attempted hours cap. See state program regulations at gsfc.georgia.gov for more information. Georgia Law requires that HOPE Scholarship at TCSG and USG institutions pay at an hourly rate up to 15 credit hours per term.

Table B3: Zell Miller Scholarship Award Amounts for Fiscal Year 2026 (6+ Credit Hours)

	Rate	6	7	8	9	10	11	12	13	14	15
University System of Georgia											
Abraham Baldwin Agricultural College	109.00	654.00	763.00	872.00	981.00	1090.00	1199.00	1308.00	1417.00	1526.00	1635.00
Albany State University (4-Year)	174.00	1044.00	1218.00	1392.00	1566.00	1740.00	1914.00	2088.00	2262.00	2436.00	2610.00
Albany State University (2-Year)	132.00	792.00	924.00	1056.00	1188.00	1320.00	1452.00	1584.00	1716.00	1848.00	1980.00
Atlanta Metropolitan State College	109.00	654.00	763.00	872.00	981.00	1090.00	1199.00	1308.00	1417.00	1526.00	1635.00
Augusta University (Health Sciences)	303.00	1818.00	2121.00	2424.00	2727.00	4542.00	4542.00	4542.00	4542.00	4542.00	4542.00
Augusta University (Summerville)	235.00	1410.00	1645.00	1880.00	2115.00	3532.00	3532.00	3532.00	3532.00	3532.00	3532.00
Clayton State University	174.00	1044.00	1218.00	1392.00	1566.00	1740.00	1914.00	2088.00	2262.00	2436.00	2610.00
College of Coastal Georgia	109.00	654.00	763.00	872.00	981.00	1090.00	1199.00	1308.00	1417.00	1526.00	1635.00
Columbus State University	187.00	1122.00	1309.00	1496.00	1683.00	1870.00	2057.00	2244.00	2431.00	2618.00	2805.00
Dalton State College	109.00	654.00	763.00	872.00	981.00	1090.00	1199.00	1308.00	1417.00	1526.00	1635.00
East Georgia State College	105.00	630.00	735.00	840.00	945.00	1050.00	1155.00	1260.00	1365.00	1470.00	1575.00
Fort Valley State University	174.00	1044.00	1218.00	1392.00	1566.00	1740.00	1914.00	2088.00	2262.00	2436.00	2610.00
Georgia College and State University	–	2278.00	2278.00	2278.00	2278.00	2278.00	2278.00	3848.00	3848.00	3848.00	3848.00
Georgia Gwinnett College	137.00	822.00	959.00	1096.00	1233.00	1370.00	1507.00	1644.00	1781.00	1918.00	2055.00
Georgia Highlands College	105.00	630.00	735.00	840.00	945.00	1050.00	1155.00	1260.00	1365.00	1470.00	1575.00
Georgia Institute of Technology	–	3124.00	3124.00	3124.00	3124.00	3124.00	3124.00	5256.00	5256.00	5256.00	5256.00
Georgia Southern University	187.00	1122.00	1309.00	1496.00	1683.00	1870.00	2057.00	2244.00	2431.00	2618.00	2805.00
Georgia Southwestern State University	174.00	1044.00	1218.00	1392.00	1566.00	1740.00	1914.00	2088.00	2262.00	2436.00	2610.00
Georgia State University	306.00	1836.00	2142.00	2448.00	2754.00	3060.00	3366.00	3672.00	3978.00	4284.00	4590.00
Georgia State University - Perimeter College	105.00	630.00	735.00	840.00	945.00	1050.00	1155.00	1260.00	1365.00	1470.00	1575.00
Gordon State College	109.00	654.00	763.00	872.00	981.00	1090.00	1199.00	1308.00	1417.00	1526.00	1635.00
Kennesaw State University	190.00	1140.00	1330.00	1520.00	1710.00	1900.00	2090.00	2280.00	2470.00	2660.00	2850.00
Middle Georgia State University	174.00	1044.00	1218.00	1392.00	1566.00	1740.00	1914.00	2088.00	2262.00	2436.00	2610.00
Savannah State University	174.00	1044.00	1218.00	1392.00	1566.00	1740.00	1914.00	2088.00	2262.00	2436.00	2610.00
South Georgia State College	105.00	630.00	735.00	840.00	945.00	1050.00	1155.00	1260.00	1365.00	1470.00	1575.00
University of Georgia	–	2982.00	2982.00	2982.00	2982.00	2982.00	2982.00	5017.00	5017.00	5017.00	5017.00
University of North Georgia (Four Year Degree)	191.00	1146.00	1337.00	1528.00	1719.00	1910.00	2101.00	2292.00	2483.00	2674.00	2865.00
University of North Georgia (Two Year Degree)	143.00	858.00	1001.00	1144.00	1287.00	1430.00	1573.00	1716.00	1859.00	2002.00	2145.00
University of West Georgia	187.00	1122.00	1309.00	1496.00	1683.00	1870.00	2057.00	2244.00	2431.00	2618.00	2805.00
Valdosta State University	187.00	1122.00	1309.00	1496.00	1683.00	1870.00	2057.00	2244.00	2431.00	2618.00	2805.00
Technical College System of Georgia											
All TCSG Institutions	107.00	642.00	749.00	856.00	963.00	1070.00	1177.00	1284.00	1391.00	1498.00	1605.00
Eligible Private Postsecondary Institutions											
Semester	N/A	1493.00	1493.00	1493.00	1493.00	1493.00	1493.00	2985.00	2985.00	2985.00	2985.00
Quarter	N/A	1017.00	1017.00	1017.00	1017.00	1017.00	1017.00	2034.00	2034.00	2034.00	2034.00

Source: Georgia Student Finance Commission.
Note: Award amounts at private institutions may vary during the term a student reaches the paid or attempted hours cap. See state program regulations at gsfc.georgia.gov for more information. Most award rates for University System of Georgia institutions are calculated by multiplying the Board of Regents' approved hourly rate by the number of hours enrolled; the exceptions are for institutions with flat rates and identified by –.

C Additional Details on Data Construction

C.1 High School Administrative Records

This appendix provides more details on data and variable constructions. The main dataset used in this study is based on administrative records from an anonymous public school district in Atlanta, Georgia, covering graduating cohorts from 2012 to 2023. Using school enrollment data (available from the 2003-04 through the 2023–24 school years), I define graduation status based on the exit date and withdrawal codes recorded during students' final year of high school (12th grade). Students who withdraw from the school system in 12th grade with the withdrawal reason coded as "High school graduation" and a non-missing withdrawal date are classified as high school graduates. Based on this definition, 89.56 percent of 12th-grade students are identified as graduating from high school.

Eligibility for the HOPE Scholarship requires students to have resided in Georgia for at least 12 consecutive months prior to college enrollment. I construct the residency eligibility indicator using entry codes and entry dates from the school enrollment data. Students who enter the school system during the 12th-grade school year after September 1 with entry reasons coded as "Entered from another state or U.S. territory," "Entered from another country," or "Entered from another state or country" are classified as not meeting the residency requirement for the scholarship. Information on eligibility for rigor requirements, final HOPE GPA, and final HOPE eligibility status is obtained directly from administrative records provided by the school district.

Student demographic characteristics are defined using the first available record in the student-year panel dataset. Student-year panel data is available from the 2003-04 through the 2023–24 school years. Race and ethnicity are categorized into five mutually exclusive groups: Black, White, Hispanic, Asian, and Other (Other includes American Indian, Pacific Islander, and students reporting multiple races). The free or reduced-price meal (FRPM) indicator identifies students who were eligible for the program in any observed school year. Disability status and English learner status are defined as indicators for students who were ever identified as participating in a special education program or classified as having limited English proficiency during the observation period.

C.2 NSC Data Details

The National Student Clearinghouse reports enrollment coverage of approximately 93 percent nationwide and 94.8 percent in Georgia as of Fall 2011 (Dynarski et al., 2015). Coverage is particularly high for the institution types most relevant to this study: more than 99 percent for public four-year colleges and approximately 96 percent for public two-year colleges. Because the majority of students in this sample enroll in these institution types (91 percent in four-year institutions and 86.2 percent in public colleges) the likelihood of missing enrollment records is minimal. As a result, NSC coverage is unlikely to pose a significant concern for this analysis.

The NSC data include multiple records per student because enrollment information is reported at the term level, and additional records may appear when students transfer institutions or change enrollment

intensity. To construct the analysis dataset, I collapse the NSC records into a student–institution-level dataset. Institution characteristics are assigned based on the first record associated with each student–institution pair.

C.3 Outcome Variable Construction

On-time college enrollment is defined for students matched to the NSC data who enroll in any postsecondary institution in the United States. Using the college start date and high school graduation date, I construct indicators for enrollment within specific time windows after high school graduation. Overall, 83.78 percent of students in the sample ever enroll in college after graduating from high school, 80.21 percent enroll within 16 months, and 77.82 percent enroll within 12 months. Indicators for enrollment in in-state, four-year, full-time, public institutions, as well as enrollment by institutional selectivity, are defined based on the first institution attended after high school graduation, regardless of enrollment timing.

Persistence measures are constructed based on the timing of college enrollment. I define two semesters per academic year: fall and spring. Students who are enrolled at any time in October are classified as enrolled in the fall semester, while those enrolled at any time in March are classified as enrolled in the spring semester. Using this classification, I count the number of consecutive semesters a student remains enrolled at the same institution.

Second-semester persistence is defined as enrollment for more than one consecutive semester, second-year persistence as more than two consecutive semesters, and third-year persistence as more than four consecutive semesters. Because students may begin college in either the fall or spring semester, second-semester persistence corresponds to appearing in the following spring term for students who initially enroll in the fall, or appearing in the following fall term for students who initially enroll in the spring. Bachelor's degree attainment is determined using the degree type and completion date reported in the NSC data.

D Cost-Benefit Analysis

Both programs encourage high-achieving students to remain in in-state colleges, but their impacts on completion differ. HOPE appears to improve graduation outcomes at in-state four-year colleges, whereas Zell Miller only improves in-state STEM degree attainment. To evaluate the scholarships' efficiency for social welfare and the State of Georgia, I conduct a welfare analysis using the Marginal Value of Public Funds (MVPF), following Hendren and Sprung-Keyser (2020). The MVPF is defined as the ratio of a marginal student's willingness to pay (WTP) for additional education to the net cost of providing the scholarship. I approximate WTP by the expected increase in lifetime earnings induced by the program.[22] These projected

[22]This approach assumes that marginal students are fully informed about the returns to college education and excludes non-pecuniary benefits, such as job amenities, health, or civic engagement. Including these benefits would likely increase the MVPF.

earnings gains reflect the value of increased educational attainment among students whose behavior is affected by the scholarship.

I first use reduced-form effects from the scholarship to estimate the impact on four-year college completion and on in-state four-year college completion. I then multiply this effect by the net present value of the college wage premium of $779,580. I estimate the college wage premium using Georgia-specific data from the 2017 American Community Survey (ACS) (Ruggles et al., 2025), following Bartik et al. (2016). I restrict the sample to Georgia residents aged 25–79 who report positive wage income and are currently employed. I define two education groups: high school graduates (HSG) with a regular high school diploma, a GED or alternative credential, or some college credit but no postsecondary degree; and bachelor's degree holders (BA), which includes individuals with a bachelor's degree or higher (including master's, professional, and doctoral degrees). Nominal wage income is converted to 2012 dollars using the annual CPI-U series.

For each education group, I estimate a quadratic age-earnings profile by regressing wage income on age and age^2, weighted by ACS person weights. I use the resulting coefficients to predict income at each age from 25 to 79 for both groups and calculate the age-specific college wage premium as the difference in predicted income between the BA and HSG groups. Following Bartik et al. (2016), I discount these age-specific premiums back to age 18 using a 3 percent annual discount rate and sum across ages to obtain the present discounted value (PDV) of the lifetime college wage premium. This approach yields a PDV of $779,580 in 2012 dollars.

I apply the same approach to estimate the wage premium associated with a STEM degree. I identify STEM fields using the ACS major code "degfield" and define STEM fields to include agriculture, environmental and natural resources, computer and information sciences, engineering, engineering technologies, biological and life sciences, mathematics and statistics, physical sciences, and nuclear, industrial radiology, and biological technologies. The resulting PDV of the STEM degree wage premium is $1,125,144 in 2012 dollars.

To convert earnings into after-tax income, I apply an effective federal marginal tax rate of 18.9 percent (based on estimates from the Congressional Budget Office and consistent with lifecycle averages used in Hendren and Sprung-Keyser (2020)) and Georgia's flat state income tax rate of 4.99 percent as of 2026, so that after-tax earnings equal pre-tax earnings multiplied by $(1 - 0.189)(1 - 0.0499) = 0.7705$.[23] For in-state four-year degree attainment, the 3.7 percentage point effect implies a pre-tax earnings gain of $0.037 \times \$779{,}580 = \$28{,}844.46$ and an after-tax gain of $22,225.55 per recipient. For any four-year degree attainment, the 1.8 percentage point effect implies an after-tax gain of $10,812.43. For Zell, the 4.1 percentage point effect on in-state STEM degree attainment implies an after-tax gain of $35,545.30.

The program's net cost includes both direct and indirect components, adjusted for fiscal externalities. The direct cost is the average HOPE and Zell Miller Scholarship award at four-year institutions: $14,223

[23] This assumes a time-invariant tax structure, that federal and state tax rates remain constant over the recipient's working life. Changes in tax policy would affect the after-tax earnings gain and, therefore, the MVPF. I also abstract from payroll taxes (Social Security and Medicare), which would further reduce net lifetime earnings but are excluded for consistency.

for 120 credit hours for HOPE and $15,803 for Zell (based on GSFC data) as of academic year 2012.[24] I subtract behavioral response costs associated with increased educational attainment (net of private tuition payments) estimated at $980 per student over four years, following Hendren and Sprung-Keyser (2020). The behavioral response cost assumes that students do not substitute away from labor market participation during their additional years of enrollment and does not include the opportunity cost of foregone wages. I assume that students do not transfer across institutions during the program.

I also account for increased future tax revenues by subtracting the present value of Georgia state income taxes (4.99 percent) on recipients' additional pre-tax earnings. For in-state four-year degree attainment, state tax revenue equals $0.037 \times \$779{,}580 \times 0.0499 = \$1{,}439.34$. The corresponding values are $700.22 for any four-year degree attainment and $2,301.93 for Zell's in-state STEM degree attainment.

Indirect costs arise from increased college enrollment. Using data from the Delta Cost Project, average state and local appropriations per student at Georgia four-year colleges are $6,201.40 annually (2012 dollars). A 6.4 percentage point increase in in-state enrollment implies an additional indirect cost of $396.86 per enrollee per year, or $1,587.45 over four years. For any four-year degree attainment, I apply appropriations to the 2.7 percentage point increase in overall enrollment, which implies an indirect cost of $0.027 \times \$6{,}201.40 \times 4 = \$669.75$ over four years. For Zell, the 5.6 percentage point increase in in-state enrollment implies an indirect cost of $1,389.02. This calculation assumes that state appropriations per student remain constant at their 2012 levels and that universities operate at constant returns to scale. That is, each additional enrolled student generates a proportional increase in public expenditure.[25]

Combining the components, the net cost per recipient is $\$14{,}223 - \$980 - \$1{,}439.34 + \$1{,}587.45 = \$13{,}391.11$ for in-state four-year degree attainment and $\$14{,}223 - \$980 - \$700.22 + \$669.75 = \$13{,}212.53$ for any four-year degree attainment under HOPE, and $13,910.09 for Zell. Dividing WTP by net cost yields an MVPF of 1.66 for in-state four-year degree attainment and 0.82 for any four-year degree attainment for the HOPE Scholarship, and 2.56 for in-state STEM degree attainment for the Zell Miller Scholarship. These estimates imply that each dollar of scholarship spending generates approximately $1.66 in social benefits for marginal students near the eligibility cutoff. By income background, the MVPF is 1.62 for students ever eligible for free or reduced-price meals and 1.79 for students never eligible. Table D1 summarizes the calculation, and Table D2 summarizes by student income background. This estimate is lower than the MVPF of 4.0 reported in Hendren and Sprung-Keyser (2020), which is based on earlier estimates from Cornwell et al. (2006a). The difference may reflect updated enrollment effects, changes in tuition levels, or differences in the sample and identification strategy.

The MVPF captures the broader social return to HOPE, while I separately estimate Georgia's fiscal return following Smith et al. (2025). State-level benefits are measured as the present value of additional Georgia state income tax revenues generated by increased degree attainment at in-state four-year institu-

[24] This calculation assumes students complete exactly 120 credit hours, the standard requirement for a bachelor's degree, and that the per-credit-hour award remains constant throughout enrollment. It does not account for students who take longer than 4 years to complete or who drop out after receiving partial funding, which would alter the average cost.

[25] If institutions face fixed costs or economies of scale, the marginal cost of an additional enrollee may be lower than the average cost used here, which would reduce the indirect cost estimate and raise the MVPF.

Table D1: Welfare Analysis: MVPF for Bachelor's Degree Attainment

	HOPE		Zell
	Any Four-Year	In-State Four-Year	In-State STEM
Inputs			
College wage premium (BA-HS)	\$779,580	\$779,580	\$1,125,144
Impact of program on degree attainment	0.018	0.037	0.041
Impact of program on enrollment	0.027	0.064	0.056
State tax rate	4.99%	4.99%	4.99%
Federal marginal tax rate	18.9%	18.9%	18.9%
Willingness to Pay (WTP)			
After-tax lifetime earnings gain per recipient	\$10,812.43	\$22,225.55	\$35,545.30
Program Costs			
Direct cost: Average Scholarship	\$14,223.00	\$14,223.00	\$15,803.00
Behavioral response cost	−\$980.00	−\$980.00	−\$980.00
State tax revenue	−\$700.22	−\$1,439.34	−\$2,301.93
Indirect cost: Increased enrollment	\$669.75	\$1,587.45	\$1,389.02
Total Net Cost	\$13,212.53	\$13,391.11	\$13,910.09
MVPF	0.82	1.66	2.56

Note: Willingness to pay (WTP) is calculated using after-tax lifetime earnings gains, applying a federal marginal tax rate of 18.9% and a Georgia state tax rate of 4.99% as $(1-\tau_{\text{fed}})(1-\tau_{\text{state}})$. I estimate the college wage premium using 2017 American Community Survey (ACS) data for Georgia, following the age range, discount rate, and educational group definitions in Bartik et al. (2016). State tax revenue applies the Georgia tax rate to the pre-tax earnings gain implied by each column's degree attainment effect. Indirect costs apply annual state and local appropriations per student (\$6,201.40, Delta Cost Project) over four years to each column's enrollment effect: overall enrollment for any four-year attainment and in-state enrollment for in-state attainment. Behavioral response costs and the federal marginal tax rate follow Hendren and Sprung-Keyser (2020). All monetary values are reported in 2012 dollars.

Table D2: Welfare Analysis of HOPE: MVPF for Bachelor's Degree Attainment by Income Background

	Ever FRPM	Never FRPM
Inputs		
College wage premium (BA-HS)	\$779,580	\$779,580
Impact of program on degree attainment	0.037	0.039
Impact of program on enrollment	0.076	0.055
State tax rate	4.99%	4.99%
Federal marginal tax rate	18.9%	18.9%
Willingness to Pay (WTP)		
After-tax lifetime earnings gain per recipient	\$22,225.55	\$23,426.93
Program Costs		
Direct cost: Average Scholarship	\$14,223.00	\$14,223.00
Behavioral response cost	−\$980.00	−\$980.00
State tax revenue	−\$1,439.34	−\$1,517.14
Indirect cost: Increased enrollment	\$1,885.10	\$1,364.22
Total Net Cost	\$13,688.76	\$13,090.08
MVPF	1.62	1.79

Note: Willingness to pay (WTP) is calculated using after-tax lifetime earnings gains, applying a federal marginal tax rate of 18.9% and a Georgia state tax rate of 4.99% as $(1-\tau_{\text{fed}})(1-\tau_{\text{state}})$. I estimate the college wage premium using 2017 American Community Survey (ACS) data for Georgia, following the age range, discount rate, and educational group definitions in Bartik et al. (2016). State tax revenue applies the Georgia tax rate to the pre-tax earnings gain implied by each column's degree attainment effect. Indirect costs apply annual state and local appropriations per student (\$6,201.40, Delta Cost Project) over four years to each column's in-state enrollment effect. Behavioral response costs and the federal marginal tax rate follow Hendren and Sprung-Keyser (2020). All monetary values are reported in 2012 dollars.

tions, while costs include both direct and indirect program expenditures. Assuming that graduates remain in Georgia and face the 4.99 percent state income tax rate, the state recovers its net costs approximately 15 years after initial enrollment. Because this assumption likely overstates graduate retention in Georgia, the estimated break-even point should be interpreted as an upper bound on the state's fiscal return. If some graduates migrate out of state, tax revenues would be lower, and the break-even horizon would be longer. Such migration would reduce the state's fiscal return without affecting the MVPF.

Over a 20-year horizon, HOPE generates an estimated net present value of approximately $6,800 per participant for the state, increasing to roughly $21,300 over a 30-year horizon. These estimates assume continuous full-time employment after graduation and are sensitive to the discount rate and the length of the earnings window. The estimated long-run fiscal benefits exceed those reported in earlier evaluations of returns to public four-year universities in Georgia, which estimated 20- and 30-year returns of approximately $6,000 and $9,000, respectively (Smith et al., 2025).

Among high-income students, the state recovers its net costs in 14.7 years after initial enrollment, compared with 15.2 years among low-income students. The break-even among low-income students reflects their large gains in four-year degree attainment and the associated increase in college wage premium and state tax revenues.[26] Among higher-income students, a larger share of the fiscal return instead comes from increased retention in Georgia's workforce. By increasing degree attainment and subsequent earnings among low-income students, and by retaining more higher-income students in the state's tax base, HOPE generates fiscal returns through different channels across income groups.

The welfare analysis does not explicitly account for changes in college quality or students' fields of study. As shown in Table 9, I find no evidence that HOPE eligibility reduces the likelihood of completing a STEM degree among marginal students, either for any four-year institution or for in-state four-year institutions. The null effects in this study suggest that the program increases in-state college completion without discouraging entry into high-demand fields. Overall, the HOPE Scholarship generates positive economic returns while supporting both student success and the state's long-term growth.

[26] Bartik et al. (2016) finds that the college wage premium varies substantially by students' income background, with a considerably larger premium among students from higher-income families. In my welfare calculation, however, I apply the average college wage premium across students.