Working Paper:

The Impact of Partial and Full Merit Scholarships on College Entry and Success: Evidence from the Florida Bright Futures Scholarship Program

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I capitalize on a unique two-tiered merit-based scholarship program in Florida, the Bright Futures Scholarship, to investigate the effect of partial and full scholarships on students' college entry, credit accumulation and degree receipt. Using difference-in-differences estimation and rich student-level data, I find little impact of offering students a 75 percent scholarship relative to no merit aid, but substantial effects of offering students a 100 percent scholarship relative to a 75 percent scholarship on students' attainment at Florida public institutions. Students who were eligible for the 100 percent scholarship completed over three additional courses at the end of four years after high school at Florida public colleges and universities than students who were eligible for the 75 percent scholarship, and they were ten percentage points more likely to earn a bachelor's degree within seven years from a Florida public university. I explore different hypotheses that might explain this pattern of results.

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THE IMPACT OF PARTIAL AND FULL MERIT SCHOLARSHIPS ON COLLEGE ENTRY AND SUCCESS: EVIDENCE FROM THE FLORIDA BRIGHT FUTURES SCHOLARSHIP PROGRAM

By Benjamin L. Castleman

1. INTRODUCTION

In 1991 Arkansas Governor Bill Clinton ushered in a new era of financial aid for college. Arkansas became the first state to offer a large-scale merit-based grant program for its residents. In the years since Arkansas established its scholarship program at least 14 states have started their own programs. State spending on merit-based aid represents the most rapid growth in financial aid spending over the last 20 years, increasing from under $50 per full-time equivalent (FTE) undergraduate student in 1981-1982 to nearly $200 per FTE undergraduate in 2010-2011 (The College Board, 2012). Researchers have found merit-based programs to increase enrollment, increase degree attainment and the stock of college-educated labor in the state, and to prevent brain drain of talented students out of the state (Cornwall, Mustard, & Sridhar, 2006; Dynarski, 2000; Dynarski, 2008; Scott-Clayton, 2011; Zhang & Ness, 2010). Not surprisingly, the programs have been widely popular among state residents. They have also placed considerable strain on state revenues; these financial woes have only been exacerbated since the financial crisis of 2008. A host of states have considered cutting grant aid to address looming revenue shortages (Supiano, 2009; Tomsho, 2009).

In evaluating future investments in grant programs, of particular interest to policy makers is whether merit-based aid increases the probability that students not only enter college, but also accumulate credits and earn a degree. While the monetary and non-pecuniary benefits associated with a college degree are well-documented (Goldin & Katz, 2008), there is increasing public skepticism about the returns to college without a degree, particularly as students amass larger amounts of debt (Martin & Lehren, 2012). Nor is the existing research on the long-term impacts of merit-based grant aid conclusive: while Dynarski (2008) and Scott-Clayton (2011) found a positive impact of merit-based programs on degree attainment, Cohodes and Goodman (2012) found that eligibility for a state merit-based grant induced students to attend a lower quality college and substantially reduced the probability of on-time degree completion. State policy makers would therefore benefit from additional evidence about whether (and which) state merit-based programs positively impact students' probability of earning a degree.

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The Florida Bright Futures Scholarship (BFS) provides a valuable opportunity to contribute additional evidence in this policy arena. Florida established the BFS program in May 1997 and maintains detailed longitudinal records that track students throughout their attendance at Florida public colleges and universities. While the focal states in Dynarski (2008), Scott-Clayton (2011), and Cohodes and Goodman's (2012) analyses offer only one scholarship tier, the BFS is comprised of two tiers. Students who completed 15 core academic credits, maintained a cumulative weighted high school GPA of 3.0 or higher, and who had a composite SAT score of 970 or higher or a composite ACT score of 20 or higher qualified for the Florida Medallion Scholars (FMS) award. FMS paid 75 percent of tuition & fees at public colleges and universities (or the monetary equivalent at Florida private institutions).[2] Students who had a GPA of 3.5 or higher and a composite SAT score of 1270 or higher or a composite ACT score of 28 or higher qualified for the Florida Academic Scholars (FAS) award, which paid 100 percent of tuition & fees, plus a small living stipend, at public colleges and universities (or the monetary equivalent at Florida private institutions). Both awards were renewable so long as students achieved annual academic benchmarks, including completion of 12 credits and a 2.75 GPA for BFS-FMS, and a 3.0 GPA for BFS-FAS.

I employ a difference-in-differences (DD) approach to estimate causal effects of the BFS program on students' college attainment. I run separate analyses to estimate the effect of FMS eligibility relative to no BFS eligibility and FAS eligibility relative to FMS eligibility. I also conduct a series of analyses to explore whether the impacts I observe are a function of overall improvements in college entry and success in Florida, or rather represent a diversionary effect where students attend and graduate from in-state public institutions instead of private or out-of-state institutions.

To preview my results, I find little impact of eligibility for a 75 percent merit scholarship on whether students entered, persisted or accumulated credits in, or ultimately graduated from a Florida public college or university. By contrast, I find pronounced impacts on all of the above outcomes for students who were eligible for a 100 percent scholarship relative to students who were eligible for the 75 percent scholarship, even though the monetary difference only amounted to about $600 (2000 dollars). The most pronounced impacts were on credit accumulation and degree attainment. Students who were eligible for the 100 percent scholarship completed over three additional courses at the end of four years after high school at Florida public colleges and universities than students who were eligible for the 75 percent scholarship, and they were ten percentage points more likely to earn a bachelor's degree within seven years from a Florida public university.

I structure the remainder of the paper into several sections. In Section II, I review the existing literature on college access and success pertinent to an examination of eligibility for merit-based grants. In Section III, I describe my research design. In Section IV, I present my results. Section V concludes and discusses the implications of the results for policy and research.

2. LITERATURE REVIEW

Human capital investment models suggest that students will pursue a college education if the present discounted value (PDV) of the benefits of higher education exceeds the PDV of the costs of going to college (Becker, 1964). By reducing the cost of going to college, financial aid may lower the cost of attendance to the point where students on the margin of enrolling decide to matriculate. The findings from the empirical literature are largely consistent with the prediction that initial grant eligibility should increase enrollment. Researchers have consistently found positive effects for grant programs that have transparent eligibility criteria and straightforward application processes (see Deming and Dynarski, 2009, for a review of these studies). Program impacts are particularly pronounced for state merit programs, such as Georgia HOPE, that were highly publicized and had clear, transparent rules for determining the amount of aid made available to eligible students (Dynarski, 2000; Dynarski, 2004).

While theory and the research literature suggest that financial aid can positively impact initial college enrollment, economic theory is more ambiguous about the effect of financial aid on whether students *succeed* in college (Dynarski, 2008). Among students who have already committed to enrolling in college, grant assistance may indirectly improve their academic outcomes by reducing the amount of time they need to work once they are enrolled. At the same time, aid may have no effect on students' collegiate success if the offer of aid sufficiently lowers costs to the point where students with a low probability of success choose to enroll.

Despite the volume of literature examining the impact of grant eligibility on whether students enroll in college, until recently there has been little research identifying the causal impact of grant eligibility on whether students accumulated credits and earned a degree. The lack of additional research on the long-term impacts of grant aid can be attributed to two intertwined challenges. First, little longitudinal data has been available until recently to track students' success in college beyond the point of initial enrollment. Second, aid is not awarded randomly, and so it is methodologically difficult to separate out the unique effect of grant eligibility from all of the other factors that

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influence whether students succeed in college. Without a source of exogenous variation in whether students are eligible for a merit-based grant, estimates of the effect of grant eligibility on degree attainment would likely be upwardly biased: Students who receive merit-based aid may be more likely to succeed in college because they were motivated and capable enough to achieve the academic benchmarks for grant eligibility in high school. These same characteristics are likely positively correlated with collegiate success, which would lead to overestimates of the impact of BFS eligibility.

Recently, several researchers have overcome these challenges by identifying a source of quasi-random variation in why some students qualified for merit-based aid while others did not. Dynarski (2008) found that the introduction of state merit scholarships in Arkansas and Georgia led to increases in the share of the population in each state with college degrees within 10 years of program inception. Scott-Clayton (2011) found that students who were just above an arbitrary cut-off in the ACT exam score that determined whether students were eligible for the West Virginia PROMISE scholarship were 4.5 percentage points more likely to earn a bachelor's degree within five years than students just below the eligibility threshold. Similarly, Cohodes and Goodman (2012) exploited cut-offs in test score thresholds used to determine student eligibility for tuition waivers at public colleges and universities in Massachusetts. In contrast to Dynarski (2008) and Scott-Clayton (2011), the authors found that grant eligibility induced students to attend more affordable but lower quality public institutions, and that this choice resulted in a substantially lower probability of on-time degree completion .

My paper focuses on the following question: Does eligibility for a 75 percent scholarship, and separately eligibility for a 100 percent scholarship above the 75 percent scholarship, increase the probability that a student will enroll in college, stay continuously enrolled, accumulate credits, and ultimately earn a degree? By focusing on this question, I hope to build on prior research in two concrete ways. First, the Florida data set is particularly valuable for analyzing degree attainment, as I am able to observe degree receipt for at least seven years following high school. The longer time horizon in which I can observe degree attainment is important**:** Bound, Lovenheim, and Turner (2010) found that, among students who earned a college degree within eight years, only 44 percent did so within four years, whereas 96 percent had done so within seven years. Second, the impacts of the BFS may also better generalize to other regions of the country. Florida is the fourth largest state in the country (U.S Census Bureau, 2010). Fourteen of the 100 largest school districts in the 2008-2009 academic year were located in Florida (NCES, 2010). Florida also represents the increasing

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racial and ethnicity diversity of the country as a whole: 16 percent of its residents are Black, and 23 percent of its residents are of Hispanic or Latino origin (U.S Census Bureau, 2010).

3. EMPIRICAL METHODS

3.1 Data

The data for this paper are from the Florida Department of Education K-20 Data Warehouse (KDW), which maintains longitudinal student-level records from primary school through post-graduate study at Florida public colleges and universities. I have data from the KDW secondary-school records beginning when students were in 9th grade, including demographic information, high school transcript records, and college entrance-examination scores.[3] This data is linked to the KDW postsecondary data so that I have the financial information that families supplied while completing the FAFSA and any private, institutional, state, or federal financial-aid disbursements students received while enrolled. The postsecondary data also tracks students' enrollment and course-taking histories, major(s) pursued, and degrees received in college.

While this data set does not contain the postsecondary outcomes of students who attend out-of-state or private institutions[4], it contains college enrollment and completion records for a considerable majority of college-bound Florida high school seniors. In the 2000-2001 academic year, for instance, 90 percent of Florida residents who enrolled in college for the first time did so at in-state institutions. During the same year, 74 percent of first-time freshmen attending college in Florida enrolled in public institutions. These patterns are similar for the earlier cohorts (NCES, 1998; NCES, 2000; NCES, 2002).

For this analysis, I focus on three different cohorts of Florida high school seniors: the 1995-1996 cohort, who graduated before Florida introduced BFS; the 1997-1998 cohort, who were at the end of their junior year in high school when Florida introduced BFS; and the 1999-2000 cohort, who were at the end of their freshman year in high school when Florida introduced BFS. From these 281,192[5] students, I restrict my analytic sample to include students for whom I have measures of cumulative high school GPA and academic credits completed while in high school. Variables capturing cumulative GPA and academic credits are not available in the Florida data warehouse. Rather, I constructed these variables from student high school transcript records, following state guidelines for calculating both cumulative weighted GPA and cumulative Bright Futures-approved credits completed in each academic subject. I did not have access to students' courses taken in high

schools out-of-state, or at private schools in Florida. Therefore, I was only able to calculate cumulative GPA and credits completed for students who were continuously enrolled in a Florida public high school from 9th – 12th grade. This restriction is essential to determine whether students in each cohort were BFS-eligible or not, and resulted in the exclusion of 113,789 students from my sample.[6,7]

In Table 1, I present selected descriptive statistics for the full sample of students in each cohort (columns 1, 5, and 9) and compare them with the same statistics estimated for the sample of students for whom I have measures of cumulative high school GPA and academic credits (columns 2, 6, and 10). I also compare these samples to the sample of students who were eligible for the BFS-FMS award but not the BFS-FAS award (columns 3, 7, and 11), along with those who were eligible for the BFS-FAS award (columns 4, 8, and 12). Several interesting patterns emerge: first, the 1995-1996 senior cohort is considerably smaller compared to the 1997-1998 and 1999-2000 cohorts: 85,810 students compared to 94,288 and 101,094 students, respectively. These patterns largely reflect growth in the population of 15 – 19 year-olds in Florida over the same time period: whereas 841,278 individuals age 15 – 19 resided in Florida in July 1995, 957,418 did so in July 1999 (U.S. Census Bureau, 2000). Second, a considerably higher proportion of the 1995-1996 cohort was continuously enrolled in high school than in the latter two cohorts: 67 percent compared with 58 percent and 54 percent, respectively. This trend appears to be driven primarily by the increase in the total size of the high school senior cohort from 1995-1996 through 1999-2000; the raw number of continuously enrolled students is quite similar across cohorts.

<<Table 1 about here>>

Despite these differences, however, there are also striking similarities across the cohorts. Within and across cohorts, the demographic composition of the entire student body is very similar to the composition of the subset of continuously-enrolled students, with a slightly higher proportion of White students among the continuously-enrolled students. Perhaps the most striking trend is that, while cumulative GPA and math credits trend higher with each successive cohort, mean composite SAT scores are essentially unchanged across cohorts. In other words, students who were high school seniors after Florida introduced the BFS program performed better and completed more math credits, although according to an external achievement measure, the cohorts don't appear to have experienced achievement gains over time.

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Also of note is the differences between BFS-eligible students and the full and continuously-enrolled students. BFS-eligible students were considerably more likely to White, and a smaller portion qualified for free/reduced price lunch. These differences are particularly pronounced among BFS-FAS-eligible students. For instance, in the 1999-2000 high school senior cohort, 67 percent of the continuously enrolled students were White and 16 percent qualified for free/reduced price lunch, but 84 percent of BFS-FAS-eligible students were White, and only 3 percent qualified for free/reduced price lunch.

3.2 Empirical Strategy

Florida's use of strict academic cut-offs to determine BFS eligibility appears, at first glance, to lend itself to a regression discontinuity (RD) strategy for estimating causal effects. RD designs assume that students on either side of the cut-off are equivalent in every dimension except for grant eligibility; estimated differences in the outcome (e.g. college attainment) can therefore be attributed to the unique effect of the BFS program. I do not find support for this assumption. Using McCrary's (2008) density test, I examined the distribution of students' composite SAT scores in two different senior year cohorts, 1997-1998 and 1999-2000, for evidence of an increase in the density of observations just above the FMS and/or FAS eligibility thresholds. A spike in density just above the cut-offs would provide suggestive evidence that students manipulated their SAT score to qualify for BFS. The concern is that such manipulation is correlated with other characteristics (e.g. motivation or assertiveness) that could also be positively related to college success. This omitted variables bias would undermine the equality-in-expectation assumption on which RD designs rest.

In Figure 1, I present the results of this analysis in graphical form. The plots in the left-hand column pertain to the 1997-1998 cohort, while those in the right-hand column pertain to the 1999-2000 cohort. The plots in the top and bottom rows present the density of observations around the SAT cut-offs for BFS-FMS and BFS-FAS eligibility, respectively. For each cohort and across both the BFS-FMS and BFS-FAS SAT eligibility cut-offs, I find substantial spikes in the density of observations just above the eligibility threshold. The spike in density at both the BFS-FMS and BFS-FAS thresholds is particularly pronounced for the 1999-2000 cohort, which is not surprising since these students had two additional years in which to get their SAT scores above the eligibility cut-off.

<<Figure 1 about here>>

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To account for the positive selection biases that result from students manipulating their GPAs and SAT scores, I instead use a difference-in-differences strategy to estimate the causal effect of BFS eligibility on whether students enter, accumulate credits in, and ultimately graduate from college. I compare changes in college entry and attainment for students who were BFS-eligible before and after Florida introduced the BFS program to changes in college entry and attainment for students who were not BFS-eligible before and after Florida introduced the program. I run separate analyses to estimate the effect of FMS eligibility relative to no BFS eligibility and FAS eligibility relative to FMS eligibility. In both analyses I condition the sample on students who met the high school GPA and academic requirements for each BFS tier, so that students' SAT scores are the sole factor that determined their eligibility. More specifically, I define students as BFS-FMS-eligible if they had composite SAT scores of at least 970 but less than 1270; had completed at least 15 core academic credits; and had cumulative high school GPAs of at least 3.0 but less than 3.5. I define students as BFS-FAS-eligible if they had composite SAT scores of 1270 or higher; had completed at least 15 core academic credits; and cumulative high school GPAs of 3.5 or higher. These definitions ensure that the sample of FMS-eligible students is distinct from the sample of FAS-eligible students.

The key assumption in DD analyses is that the comparison group (BFS-ineligible students for the FMS analysis and FMS-eligible students for the FAS analysis) adequately captures what the trend in college attainment would have been for the BFS-eligible students had the program not been introduced (Murnane & Willett, 2011). Given the evidence of strategic positioning around the BFS cut-offs that I describe for the 1997-1998 and 1999-2000 cohorts, one concern with the DD approach is that the composition of students on either side of the eligibility cut-off may have changed during the time period that Florida introduced BFS. If this were the case, I would not be able to separately identify the effect of the offer of merit-based grant aid on students' college outcomes from the possibility that eligible students' outcomes had improved because more motivated and savvy students had manipulated their SAT scores to be just above the eligibility threshold. If motivation and savviness are correlated with collegiate success, this compositional change in the BFS-eligible population could confound my attempts to identify the effect of merit-based grant aid.

Fortunately, the available evidence suggests that the composition of BFS-eligible and BFS-ineligible students remained constant before and after the introduction of the scholarship program. In Table 2 I present selected descriptive statistics for the samples of BFS-eligible and –ineligible

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students, before and after Florida introduced the scholarship program. In the top panel I present descriptive statistics for students who were eligible for BFS-FMS, the 75 percent scholarship, compared with students who were not eligible for a BFS award. In the bottom panel I present descriptive statistics for students who were eligible for BFS-FAS, the 100 percent scholarship, compared with students who were not eligible for BFS-FAS, but who were still eligible for a BFS-FMS award. I provide in column 3 the difference in outcomes between eligible and ineligible students for the 1995-1996 cohort (students who were high school seniors before Florida introduced the BFS scholarship). In column 6 I provide the difference in outcomes between eligible and ineligible students for the 1997-1998 cohort, and in column 9 the difference in outcomes between eligible and ineligible students for the 1999-2000 cohort. Finally, in column 10 I provide the difference-in-differences in student-level characteristics between the 1995-1996 cohort and the 1999-2000 cohort, for each outcome.

<<Table 2 about here>>

For both scholarship tiers there is little change in the composition of ineligible and eligible students before and after the program was introduced. For instance, in the 1995-1996 senior cohort, before BFS was introduced, students who would have met the eligibility criteria for BFS-FMS were 17 percentage points more likely to be white than students who would have been ineligible for the scholarship based on their SAT scores (81 percent versus 64 percent). In the 1999-2000 cohort, BFS-FMS-eligible students were 18 percentage points more likely to be white. This pattern of small differences in the composition of eligible and ineligible students holds across student characteristics and for both scholarship tiers, and suggests that the parallel trends requirement for DD analyses holds.

To estimate the causal effect of each tier of BFS eligibility on college entry and attainment, I fit the following statistical model:

$$(1)\ COLLEGE_{ij} =$$

$$\beta_0 + \beta_1 BF\_ELIG_{ij} + \beta_2 HS\_9798_{ij} + \beta_3 HS\_9900_{ij} + \beta_4 BF\_ELIG_{ij} x HS\_9798_{ij} +$$

$$\beta_5 BF\_ELIG_{ij} x HS\_9900_{ij} + \gamma ACAD'_{ij} + \delta DEMOG'_{ij} + \rho SCH\square OL'_j + \epsilon_{ij}$$

where *COLLEGE* is one of several measures of students' college entry, persistence, and success. *BF_ELIG* is an indicator variable that takes on the value of "1" if students are above the FMS or FAS SAT eligibility cut-off, and zero otherwise. HS_9798 and HS_9900 are indicator variables that

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take on the value of "1" if students are in the respective cohort, and zero otherwise. *ACAD* is a vector of academic covariates, *DEMOG* is a vector of demographic covariates, *SCHOOL* is a vector of high school fixed-effects, and ε is a residual error term. I cluster errors at the high-school-level to adjust for the potential correlation of residuals within school. In this model, parameter β_4 describes the causal effect of BFS eligibility for students in the 1997-1998 high school cohort, while β_5 describes the causal effect of BFS eligibility for students in the 1999-2000 high school cohort.

As indicated in the model, I incorporate a broad range of academic and demographic covariates into my analyses. I include measures of students' cumulative GPA and cumulative academic credits completed in high school, along with students' gender, race/ethnicity, and whether students qualified for free/reduced price lunch during senior year. Finally, I include a vector of high school fixed-effects to control for school-specific (and by proxy, neighborhood-specific) effects on students' educational attainment. One important covariate I am not able to include in my analysis is students' Estimated Family Contribution to college (EFC), calculated by the United States Department based on income and assets information that students provided on the Free Application for Federal Student Aid (FAFSA). Students' EFC determined their eligibility for both the need-based federal Pell Grant and the need-based Florida Student Access Grant. Unfortunately the KDW does not contain records of students' EFC for the 1995-1996 or 1997-1998 cohorts of high school seniors. However, as I show in Table 1, the proportion of students qualifying for free/reduced price lunch was stable both across cohorts, for each set of sample definitions. To the extent that free/reduced lunch status proxied for need-based aid eligibility, it does not appear that there were differential trends in need-based aid eligibility before or after the introduction of the BFS program.

While I do not observe students' enrollment at in-state private or out-of-state institutions, I am able to capitalize on the existence of a Florida state grant awarded to enrollees at in-state private institutions (the Florida Resident Assistance Grant) to infer whether any college entry effects I observe are driven by inducing students away from attending private institutions.[8] If the impacts of BFS eligibility on FRAG receipt are statistically indistinguishable from zero, I can reasonably conclude that the BFS program increased overall enrollment or drew students in from out of state, rather than inducing students away from attending private institutions.[9]

4. RESULTS

4.1 Descriptive comparison of mean outcomes

In Table 3 I begin my analyses with a straightforward comparison of outcome means by high school cohort and eligibility status. The results of this descriptive analysis should parallel the difference-in-differences estimates I provide in the formal regression analyses that follow. The organization of this table parallels the organization of Table 2.

<<Table 3 about here>>

Several interesting patterns emerge from my descriptive analyses of the outcome data. First, students who would have met the eligibility criteria for BFS-FMS in the 1995-1996 cohort were much more likely to both enroll in a four-year university (18 percentage points more likely) and earn a bachelor's degree within six years (8 percentage points more likely) than students who would not have been eligible for the BFS-FMS scholarship (Top panel, column 3). The magnitude of these differences may be attributable in large part to differences in academic achievement and ability between the groups. For instance, the mean composite SAT score for BFS-FMS eligible students was 1094, while the mean composite SAT score for BFS-FMS-ineligible students was 855. Academic differences could have impacted whether students gained admission to Florida public universities to begin with, as well as whether they succeeded in college upon matriculation.

While the overall levels of attendance and graduation from four-year universities in the state increased after the introduction of Bright Futures, differences between BFS-FMS-eligible and BFS-FMS-ineligible students remained stable. For instance, 36 percent of BFS-FMS-ineligible students in the 1999-2000 cohort (column 7) and 47 percent of BFS-FMS-eligible students in the 1999-2000 cohort (column 8) earned a bachelor's degree within six years. This compares with 39 percent of BFS-FMS-ineligible students (column 1) and 47 percent of BFS-FMS-eligible students (column 2) in the 1995-1996 cohort. A simple difference-in-differences estimate would suggest that the BFS-FMS scholarship had no impact on bachelor's degree receipt (column 10).

By contrast, students who would have met the eligibility criteria for BFS-FAS (the 100 percent scholarship) in the 1995-1996 cohort were *less* likely to both enroll in a four-year university (8 percentage points less likely) and earn a bachelor's degree within six years (11 percentage points less likely) than students who would not have been eligible for the BFS-FAS scholarship but who would have still qualified for the BFS-FMS scholarship (Bottom panel, column 3). This may seem

counter-intuitive at first, however, it is important to remember that I only observe outcomes for students attending in-state public colleges and universities. Given that BFS-FAS-eligible students had cumulative weighted high school GPAs of 3.5 or higher and composite SAT scores of 1270 or higher, it is quite plausible that students who would have been BFS-FAS-eligible in the 1995-1996 cohort were instead enrolling at and earning degrees from private or out-of-state institutions.

After the introduction of the BFS program, however, there is a considerable narrowing of the gap in college enrollment and success outcomes between BFS-FAS-eligible and BFS-FMS-eligible students. For instance, in the 1999-2000 cohort, BFS-FAS-eligible students were only 2 percentage points less likely to earn a bachelor's degree within six years than BFS-FMS-eligible students. A simple difference-in-differences estimate would suggest that BFS-FAS eligibility increased bachelor's degree receipt from Florida public universities by 9 percentage points (column 10).

Thus, a simple comparison of outcome means between BFS eligibility groups and across cohorts suggests that the 75 percent BFS-FMS scholarship did not have a pronounced impact on college entry or success above and beyond differences that already existed between students who would have been BFS-FMS eligible and those who would not have been eligible for a BFS scholarship before Florida introduced the program. However, the 100 percent BFS-FAS scholarship appeared to have a substantial influence on whether academically-accomplished students graduated from in-state public universities.

4.2 Regression analysis

I now turn to the results of fitting my statistical models to the data. In Tables 4 and 5, I present results from my DD analyses of the main effect of BFS-FMS (Table 3) and BFS-FAS (Table 4) eligibility on enrollment, near term persistence, and credit accumulation outcomes. The first four columns in each table pertain to whether students enrolled in college immediately following high school: the effect of BFS eligibility on whether students enrolled overall (column 1); whether they enrolled at a four-year university (column 2); whether they enrolled at a two-year university (column 3); and whether they enrolled a private institution (as inferred by FRAG receipt; column 4). In columns 5 and 6 of each table, I present the impact of BFS eligibility on whether students remained continuously enrolled into the spring of their freshman year (column 5) and into the fall of sophomore year (column 6). The next three columns of each table examine the effect of BFS eligibility on students' credit accumulation over different time horizons: after two years (column 7);

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after three years (column 8); and after four years (column 9). The first row in each table provides the difference in outcomes for students who would have been eligible for the respective tier of BFS in the 1995-1996 cohort, before Florida introduced the program, and students who would have not been eligible for that BFS tier. The fourth and fifth rows in each table present the coefficients that indicate the causal impact of BFS eligibility for the 1997-1998 and 1999-2000 cohorts, respectively.

<<Table 4 about here>>

The point estimates on the main effect of BFS-FMS eligibility (row 1) indicate that students who met the eligibility criteria in the 1995-1996 cohort (before Florida introduced the program) were almost 15 percentage points more likely to attend Florida four-year universities than students who did not meet the eligibility criteria (column 2). For none of the outcomes I present in Table 4, however, do I find a significant impact of BFS-FMS eligibility on whether students enrolled, persisted, or accumulated credits in Florida public institutions.

By contrast, I find positive and substantial impacts of BFS-FAS eligibility relative to BFS-FMS eligibility on enrollment, persistence, and credit accumulation outcomes (Table 5). Also paralleling my earlier descriptive analyses, I find large and significant negative coefficients on the BFS-FAS eligibility indicator flag (row 1) across all models. These coefficients capture the difference in each outcome between BFS-FAS eligible and BFS-FMS eligible students in the 1995-1996 cohort, before Florida introduced the BFS program. The introduction of the BFS program appears to have increased the probability that academically-accomplished students would enter and succeed at Florida public institutions. BFS-FAS eligible students in the 1997-1998 cohort were 5 percentage points more likely to enroll in college, while eligible students in the 1999-2000 cohort were 88 percentage points more likely to enroll (column 1). The latter effect represents a 14 percent increase in enrollment over the mean enrollment rate for BFS-FMS-eligible students in the 1995-1996 cohort. The enrollment impacts for both cohorts was driven mainly by inducing students to attend four-year universities (columns 2 and 3). BFS-FAS-eligible students in the 1997-1998 cohort were 4 percentage points more likely to persist into the fall of sophomore year, while 1999-2000 FAS-eligible students were 9 percentage points more likely to persist into sophomore year (column 5). This latter effect represents a 17 percent increase over the mean persistence rate for BFS-FAS eligible students in the 1995-1996 cohort.

<<Table 5 about here>>

Across both cohorts the gap in accumulated credits between eligible and ineligible students widens over time, to the point that by the end of four years, FAS-eligible students in the 1997-1998 cohort accumulated 4.95 more credits than FMS-eligible students and FAS-eligible students in the 1999-2000 cohort accumulated 9.05 more credits than FMS-eligible students (column 9). The latter impact represents a margin of almost three courses after four years following high school, and a 20 percent increase relative to BFS-FAS eligible students in the 1995-1996 cohort.

The negative coefficients on the main effect of BFS-FAS eligibility are more likely to reflect a lower probability that BFS-FAS eligible students attended and persisted at *Florida public* colleges and universities, rather than a lower probability of college entry and persistence overall. The positive impacts of the BFS-FAS program may therefore be as much a function of inducing students who would have otherwise attended private or out-of-state institutions to instead enroll at public colleges and universities. Below, I explore several strategies to test this hypothesis.

In Tables 6 and 7, I present results from my DD analyses of the main effect of BFS-FMS (Table 4) and BFS-FAS (Table 5) eligibility on whether students earned an associate's degree or a bachelor's degree from a Florida public college or university. In each table I examine the impact of BFS eligibility on associate's degree attainment within three to five years of high school (columns 1 – 3) and on bachelor's degree attainment within four to seven years of high school (columns 4 – 7). In Table 6, the coefficients on the main effect of BFS-FMS eligibility (row 1) indicate that eligible students in the 1995-1996 cohort were considerably more likely to earn bachelors' degrees at Florida institutions before the introduction of BFS (columns 4 – 7), but considerably *less* likely to earn associates' degrees (columns 1 - 3). This is likely reflective of that fact that BFS-FMS-eligible students in the 1995-1996 cohort were much more likely to enroll initially at four-year institutions (Table 4, column 2). However, I find no impact of BFS-FMS eligibility on either associate's or bachelor's degree attainment.

<<Table 6 about here>>

On the other hand, I find pronounced impacts of BFS-FAS eligibility, relative to students who were BFS-FMS eligible, on whether students earn a degree (Table 6). BFS-FAS-eligible students in the 1995-1996 were considerably less likely to earn a degree from a Florida institution (row 1). Nor did BFS-FAS eligibility appear to affect the probability that students would complete an associate's degree.[10] However, the impacts of BFS-FAS eligibility are large and positive for whether students earn a bachelor's degree, particularly for students in the 1999-2000 cohort. The impact of

BFS-FAS eligibility on BA/BS attainment increased as the time horizon extends beyond high school graduation. For students in the 1997-1998 cohort, BFS-FAS eligible students were 4 percentage points more likely to earn a BA/BS within six years (column 6), and 5 percentage points more likely to earn a degree within seven years (column 7), though there did not appear to be an impact of BFS-FAS eligibility for students in the 1997-1998 cohort within four (column 4) or five years (column 5) of the end of high school. For students in the 1999-2000 cohort, BFS-FAS eligibility increased the probability that students earned a bachelor's degree within four years of high school by 7 percentage points (column 4). By six and seven years out of high school BFS-FAS eligible students in the 1999-2000 cohort were 10 percentage points more likely to hold a BA/BS (column 6 and 7). This latter effect represents a 20 percent increase relative to BFS-FAS eligible students in the 1995-1996 cohort.

<<Table 7 about here>>

4.3 Overall improvement in college outcomes or a diversionary effect?

Perhaps the most lingering question from my analyses is whether the impacts of the BFS-FAS award represent overall improvements in college entry, credit accumulation, and degree completion, or rather indicate that the top tier BFS scholarship diverted students from private or out-of-state institutions to Florida public colleges and universities. Because I only observe whether students enroll at in-state questions this is not a question I can answer definitively. Nonetheless, I conduct two primary analyses to investigate whether there is suggestive evidence that BFS-FAS promoted overall improvements in college outcomes or diverted students from out-of-state institutions. First, I examine whether BFS-FAS had heterogeneous effects on student sub-groups whose decisions to enroll in- or out-of-state may have been particularly affected by the offer of additional grant aid. I focus in particular on whether the effects of BFS-FAS varied by socioeconomic status; academic ability, and geographic residence. High-achieving low-income students (proxied for by free- or reduced-price lunch eligibility, or FRL) may have been particularly elastic to the offer of free tuition at in-state colleges and universities. Particularly high-achieving students may have been less elastic to the offer of merit aid since they were more likely to have a broad range of private and out-of-state alternatives where they may have also qualified for institutional merit-based awards. Students in the northern part of Florida may have also been less elastic to the offer of grant aid at in-state institutions since they would face fewer cost constraints

associated with pursuing out-of-state options (at least in nearby southern states) than students in the southern part of the state.

Unfortunately the tests associated with these hypotheses are not very informative. In Table 8 I include the same models I presented earlier for the impact of BFS-FAS on initial enrollment and bachelor's degree attainment within seven years, but include three-way interactions between the BFS-FAS indicator, each cohort indicator, and FRL (columns 1 and 2), GPA (columns 3 and 4), and whether the student lived in one of the two northern regions of the state (columns 5 and 6).[11] I do not find evidence that the effect of the BFS-FAS award varied by any of these characteristics.[12]

<<Table 8 about here>>

In Figure 2 I pursue an alternate approach to investigate whether BFS-FAS led to overall improvements in college outcomes or diverted students from out-of-state institutions. Drawing on data from the National Center for Education Statistics (NCES) Digest of Education Statistics, I plot the proportion of college freshman who had graduated from high school within the last 12 months that attended in-state institutions. I plot a bi-annual trend from 1992 – 1998 for Florida compared with the average in-state enrollment rate for three nearby states: Alabama, Mississippi, and South Carolina.[13] It is worth pointing out that this is a rough analysis at best, since the NCES data captures enrollments of all students, not just those with the academic performance to qualify for BFS-FAS. Nevertheless, in this simple difference-in-differences analysis, if the introduction of BFS led a greater proportion of Florida high school students to enroll at in-state institutions, I might observe a greater change in in-state enrollment in Florida between 1998 (the year after BFS was introduced) and the preceding years than for the nearby states. While the trend line for Florida is somewhat steeper than for the nearby states, the figure certainly does not provide a strong indication that the introduction of BFS markedly diverted students from out-of-state to in-state institutions.

<<Figure 2 about here>>

These tests therefore provide little additional evidence to inform whether the large effects I observe for BFS-FAS eligibility are due to overall improvements in college outcomes or rather are due to diverting students who would have otherwise enrolled out-of-state back to Florida public institutions.

5. DISCUSSION AND CONCLUSIONS

State merit-based aid represents the most rapid growth in financial aid spending over the last twenty years. Merit-based grants are popular among state residents but place considerable strain on state budgetary resources. Policy makers are faced with difficult decisions about whether, and at what level, to fund these programs in the future, particularly as many states grapple with revenue shortages and spending cuts to social service programs.

Using a difference-in-differences estimation strategy, I find little impact of offering students a 75 percent merit scholarship on whether they entered, persisted or accumulated credits in, or ultimately graduated from a Florida public college or university. Surprisingly, however, I find pronounced impacts on all of the above outcomes at Florida public institutions for students who were eligible for a 100 percent scholarship relative to students who were eligible for the 75 percent scholarship, even though the monetary difference only amounts to about $600. The most pronounced impacts are on credit accumulation and degree attainment. Students who were eligible for the 100 percent scholarship had completed more than 3 additional courses after four years and were 10 percentage points more likely to earn a bachelor's degree within six years than students who were eligible for the 75 percent scholarship.

A possible explanation for these trends is that BFS-FMS eligible students were already substantially more likely to enter and graduate from Florida institutions than ineligible students before Florida introduced the scholarship program. The lack of a program impact for BFS-FMS-eligible students may mean that the FMS scholarship did not induce into Florida public institutions FMS-eligible students who wouldn't have already attended to begin with. For BFS-FAS-eligible students, the FAS scholarship may have impacted whether they enrolled at Florida public institutions. As I note above, BFS-FAS-eligible students in the 1995-1996 cohort (before Florida introduced the BFS program) were considerably *less* likely to enter or graduate from Florida public institutions. Given that these students had cumulative GPAs of 3.5 or above and composite SAT scores of 1270 or above (at the 88th percentile in the distribution of SAT scores in Florida or higher), it is quite probable that they had a range of college options that, at least before the introduction of BFS, they may have viewed as superior to attending Florida public institutions. The substantial program effects I observe could therefore be a diversionary effect, where talented students who would have otherwise attended private or out-of-state institutions chose instead the full scholarship

at state colleges and universities. This is an important open question that remains following my analysis, and one that merits additional investigation. To definitively answer this question, one would ideally merge in records from the National Student Clearinghouse to observe students' private and out-of-state enrollment patterns. However, I do not currently have access to NSC data for the cohorts I use in my analyses.

It is worth noting that the BFS-FAS eligibility impacts were consistently larger for the 1999-2000 high school senior cohort than for the 1997-1998 high school senior cohort. This may reflect the value of having two additional years in high school to respond to the incentives created by the scholarship program. For instance, the State of Florida weights rigorous courses to count more heavily towards students' cumulative GPA. The pronounced impacts for students in the 1999-2000 cohort could therefore reflect stronger academic preparation coming out of high school. The BFS program may also have had a more profound impact on students' college aspirations and intentions in the 1999-2000 cohort, since the heavy publicity surrounding the program began when these students were freshmen in high school. The availability of a full scholarship may have induced more students to view college as a realistic option for their future, and to work harder in high school to achieve this goal.

In closing, the BFS program resulted in a massive infusion of merit-based grant aid in the State of Florida. My analysis suggests that the program had a pronounced impact on whether academically high-achieving students enrolled at and succeeded in in-state public institutions. Whether the program increased the social welfare of Florida residents remains an open question.

FOOTNOTES

[1] From the perspective of the individual, enrolling out of state may be an optimal outcome, in terms of the quality of institutional fit and their assessment of the probability they will succeed at the institution. This is particularly likely to be the case for academically-accomplished students who command considerable institutional grant aid. State policy makers may nonetheless decide that it is optimal to try to induce these students to attend college in-state, if by virtue of doing so they are more likely to reside and work in the state after college. For a discussion of the relationship between merit-based aid programs and state concerns about brain drain, see Zhang & Ness (2010).

[2] In the 2000-2001 academic year (one of the focal years in my analyses) this was equivalent to approximately $1,700 (2000 dollars).

[3] I use concordance guidelines published by The College Board to convert composite ACT scores into composite SAT scores. For instance, a composite ACT score of 36 is equivalent to a composite SAT score of 1600.

[4] While I do not directly observe enrollment at private institutions, I can infer whether BFS eligibility impacted attendance at private institutions based on whether BFS-eligible students were more or less likely to receive a Florida state grant awarded to students who attend private institutions in the state. I describe this analysis in greater detail below.

[5] There were 85,810 students in the 1995-1996 cohort; 94,288 students in the 1997-1998 cohort; and 101,094 students in the 1999-2000 cohort.

[6] I exclude 28,369 students from the 1995-1996 cohort; 39,380 students from the 1997-1998 cohort; and 46,040 students from the 1999-2000 cohort.

[7] Note that because the 1999-2000 cohort were high school freshmen when Florida introduced BFS, my sample does not include students whose families might have moved to Florida to capitalize on the availability of the scholarship program. To the extent that the characteristics that induced families to move to Florida to take advantage of BFS (greater parental investment in their child's education, greater awareness of college costs and financial aid programs, etc) were positively correlated with collegiate success, excluding these students from my analysis should lead to an underestimate of the impact of the BFS program.

[8] The Florida Resident Assistance Grant was a non-need-based tuition assistance grant of $2,800, designed to offset the cost of tuition at private institutions. Eligible institutions included secular, non-profit institutions that granted bachelor's degrees and that received regional accreditation. Students attending eligible in-state private colleges full-time automatically received the grant, so it is a good indicator of attendance at those institutions.

[9] Booker et al (2008) use this strategy in their examination of the impact of charter school attendance on college-going in Florida.

[10] Students in the 1999-2000 cohort were 2.7 percentage points more likely to complete an associate's degree within three years. However, because this estimate is only significant at the 0.10 level, and because it is the only significant impact on associate's degree attainment, I hesitate to place much emphasis on this result.

[11] The models also include all requisite two-way interactions.

[12] Though the three-way interaction between BFS-FAS, the 1999-2000 cohort, and FRL is negative, the BFS x cohort x FRL interactions are jointly insignificant so I hesitate to put too much emphasis on this one differential effect.

[13] This information is available from the Digest of Education Statistics every other year (i.e.. 1992, 1994, 1996, 1998). I exclude Georgia because it introduced the HOPE merit scholarship over the same time period.

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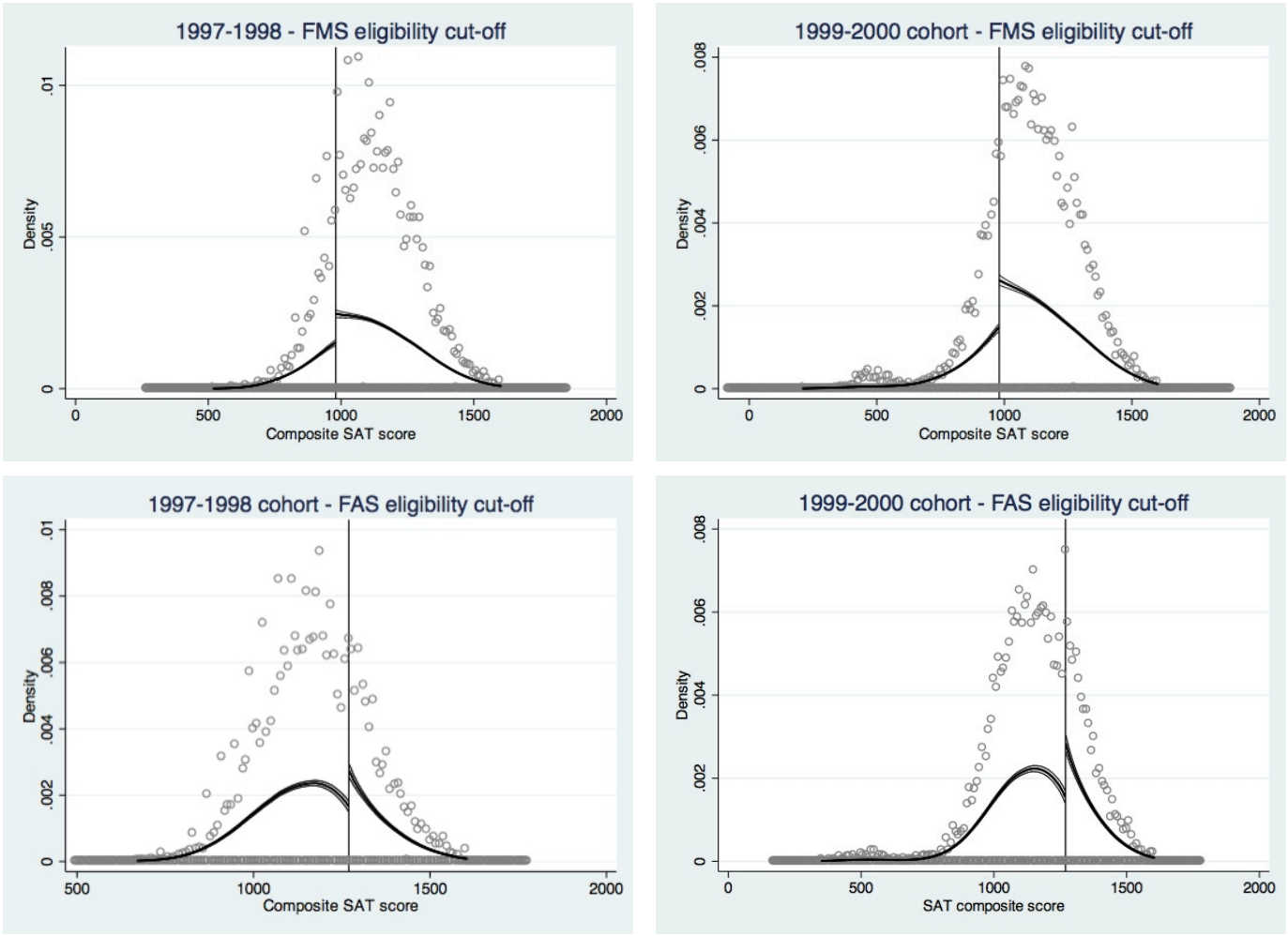
Figure 1: Density of observations around the BFS-FMS and BFS-FAS SAT eligibility cut-offs



Notes: Composite SAT score refers to students' highest composite SAT score, as reported in the Florida K20 Data Warehouse. The density function of composite SAT score was estimated using McCrary's (2008) test for manipulation of the forcing variable in regression discontinuity analyses.

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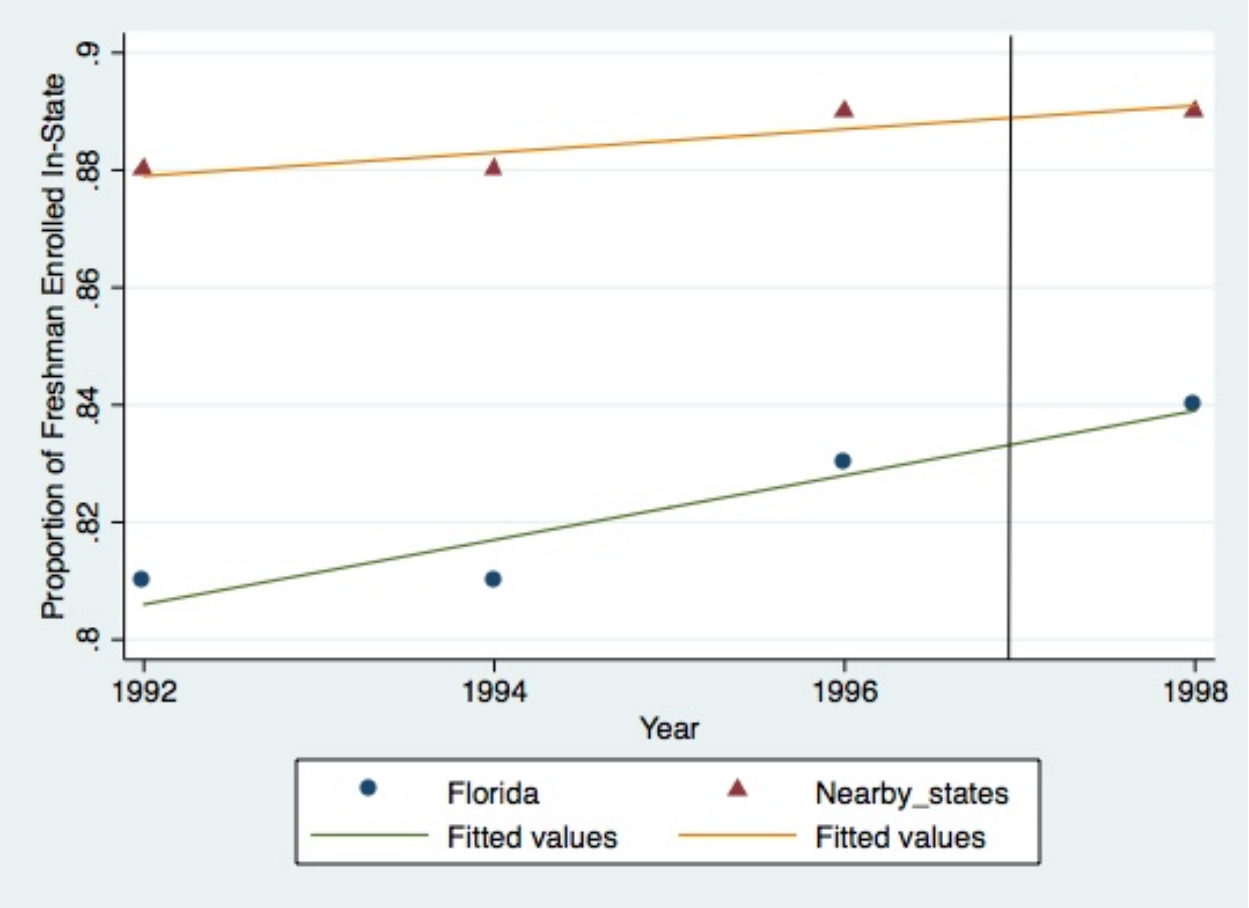
Figure 2: Trends in in-state enrollment for college freshman in Florida and nearby states



Notes: Data obtained from the National Center of Education Statistics Digest of Education Statistics, 1995, 1996, 1998, and 2000. The vertical line corresponds to when Bright Futures was introduced, in the spring of 1997.

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Table 1: Summary Statistics of the Data – Baseline Covariates

	1995-1996 HS senior cohort				1997-1998 HS senior cohort				1999-2000 HS senior cohort			
	Full Sample	*Restricted Sample*	*FMS Eligible Sample*	*FAS Eligible Sample*	*Full Sample*	*Restricted Sample*	*FMS Eligible Sample*	*FAS Eligible Sample*	*Full Sample*	*Restricted Sample*	*FMS Eligible Sample*	*FAS Eligible Sample*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Female	0.53	0.53	0.54	0.49	0.53	0.53	0.54	0.50	0.53	0.53	0.51	0.50
	[85,810]	[57,441]	[1,971]	[1,140]	[94,288]	[54,908]	[3,163]	[1,946]	[101,094]	[55,054]	[2,786]	[1,988]
White	0.62	0.68	0.81	0.84	0.62	0.69	0.81	0.86	0.62	0.67	0.78	0.84
	[85,810]	[57,441]	[1,971]	[1,140]	[94,288]	[54,908]	[3,163]	[1,946]	[101,094]	[55,054]	[2,786]	[1,988]
Black	0.21	0.19	0.08	0.03	0.20	0.18	0.08	0.02	0.20	0.20	0.10	0.03
	[85,810]	[57,441]	[1,971]	[1,140]	[94,288]	[54,908]	[3,163]	[1,946]	[101,094]	[55,054]	[2,786]	[1,988]
Hispanic	0.15	0.10	0.07	0.05	0.14	0.10	0.08	0.04	0.15	0.11	0.08	0.05
	[85,810]	[57,441]	[1,971]	[1,140]	[94,288]	[54,908]	[3,163]	[1,946]	[101,094]	[55,054]	[2,786]	[1,988]
Other Race	0.03	0.03	0.04	0.09	0.03	0.03	0.04	0.09	0.04	0.03	0.03	0.08
	[85,810]	[57,441]	[1,971]	[1,140]	[94,288]	[54,908	[3,163]	[1,946]	[101,094]	[55,054]	[2,786]	[1,988]
Free/red lunch	0.17	0.16	0.07	0.03	0.15	0.14	0.06	0.03	0.17	0.16	0.06	0.03
	[85,810]	[57,441]	[1,971]	[1,140]	[94,288]	[54,908]	[3,163]	[1,946]	[101,094]	[55,054]	[2,786]	[1,988]
SAT composite	1026	1020	1093	1361	1036	1046	1086	1355	1026	1035	1080	1353
	(211)	(206)	(79)	(73)	(208)	(175)	(78)	(32)	(217)	(214)	(77)	(73)
	[27,533]	[22,830]	[1,971]	[1,140]	[31,711]	[22,940]	[3,163]	[1,946]	[35,866]	[20,531]	[2,786]	[1,988]
Cumulative HS GPA	2.61	2.61	3.24	4.09	2.74	2.74	3.25	4.11	2.84	2.84	3.25	4.13
	(0.77)	(0.77)	(0.14)	(0.28)	(0.77)	(0.77)	(0.14)	(0.29)	(0.75)	(0.75)	(0.15)	(0.28)
	[57,270]	[57,270]	[1,971]	[1,140]	[54,787]	[54,771]	[3,163]	[1,946]	[54,941]	[54,928]	[2,786]	[1,988]
Math HS credits	2.45	2.45	3.71	4.05	2.83	2.83	3.72	4.12	3.03	3.03	3.84	4.33
	(1.21)	(1.21)	(0.58)	(0.59)	(1.21)	(1.21)	(0.65)	(0.72)	(1.13)	(1.13)	(0.68)	(0.79)
	[57,441]	[57,441]	[1,971]	[1,140]	[54,924]	[54,908]	[3,163]	[1,946]	[55,074]	[55,054]	[2,786]	[1,988]

Source: Florida Department of Education K-20 Data Warehouse.

Notes: Means are shown with standard deviations in parentheses and the number of observations in brackets. The full sample is comprised of all Florida public high school seniors. The restricted sample is comprised of students with complete HS transcript information. The FMS-eligible samples are comprised of students who met the high school GPA, academic credit, and composite SAT (or composite ACT equivalent) requirements for FMS but not FAS (i.e. they completed at least 15 credits, had GPAs of 3.0 – 3.49, and had composite SAT scores of 970 – 1260). The FAS-eligible samples are comprised of students who met the high school GPA, academic credit, and composite SAT (or composite ACT equivalent) requirements for FAS (i.e. they completed at least 15 credits, had GPAs of at least 3.5, and had composite SAT scores of at least 1270. Cumulative HS GPA is measured on a weighted 4.5 scale. One math credit is equivalent to one year of coursework.

Table 2: Summary Statistics of the Data – Covariates

Panel 1: BFS-FMS eligible vs. BFS-FMS not eligible (Eligible for a 75 percent scholarship vs. not eligible for a BFS scholarship)

	1995-1996 HS senior cohort			1997-1998 HS senior cohort			1999-2000 HS senior cohort			**Diff-in-diffs (9) – (3)**
	Not FMS eligible (1)	FMS eligible (2)	Difference (2) – (1) (3)	Not FMS eligible (4)	FMS eligible (5)	Difference (5) – (4) (6)	Not FMS eligible (7)	FMS eligible (8)	Difference (8) – (7) (9)	**(10)**
White	0.64	0.81	0.17	0.65	0.80	0.15	0.59	0.77	0.18	**0.01**
Composite SAT score	855.43	1094.17	238.74	889.34	1088.10	198.76	844.62	1080.82	236.21	**-2.53**
Qualified for free- or reduced-price lunch	0.09	0.04	-0.05	0.10	0.04	-0.06	0.11	0.04	-0.07	**-0.02**
N	735	1,848	--	1,086	2,886	--	1,277	2,786	--	--

Panel 2: BFS-FAS eligible vs. BFS-FMS eligible (Eligible for a 100 percent scholarship vs. eligible for a 75 percent scholarship)

	1995-1996 HS senior cohort			1997-1998 HS senior cohort			1999-2000 HS senior cohort			**Diff-in-diffs (9) – (3)**
	FMS eligible; not FAS elig. (1)	FAS eligible (2)	Difference (2) – (1) (3)	FMS eligible; not FAS elig. (4)	FAS eligible (5)	Difference (5) – (4) (6)	FMS eligible; not FAS elig. (7)	FAS eligible (8)	Difference (8) – (7) (9)	**(10)**
White	0.81	0.84	0.03	0.81	0.85	0.04	0.79	0.83	0.04	**0.01**
Composite SAT score	1141.10	1361.72	220.62	1128.81	1355.65	226.84	1123.84	1353.52	228.68	**8.06**
Qualified for free- or reduced-price lunch	0.04	0.02	-0.02	0.03	0.01	-0.02	0.04	0.01	-0.03	**-0.01**
N	2,422	1,120	--	4,116	1,913	--	4,271	1,988	--	--

Notes: In Panel 1 I condition on students who met the high school GPA and academic credit requirements for BFS-FMS eligibility but not BFS-FAS eligibility (i.e. they completed at least 15 credits and had GPAs of 3.0 – 3.49). BFS – FMS-eligible students were those who, in addition to fulfilling these requirements, met the composite SAT benchmark for BFS - FMS eligibility but not BFS-FAS eligibility (i.e. a composite SAT score between 970 and 1260, or its ACT equivalent). In Panel 2 I condition on students who met the high school GPA and academic credit requirements for BFS-FAS eligibility (i.e. they completed at least 15 credits and had GPAs of 3.5 or higher). BFS – FAS-eligible students were those who, in addition to fulfilling these requirements, met the composite SAT benchmark for BFS - FAS eligibility (i.e. they had composite SAT scores of 1270 or higher, or its ACT equivalent). BFS – FAS-ineligible students in Panel 2 were still eligible for a BFS-FMS Scholarship.

Table 3: Summary Statistics of the Data – Outcomes

Panel 1: BFS-FMS eligible vs. BFS-FMS not eligible (Eligible for a 75 percent scholarship vs. not eligible for a BFS scholarship)

	1995-1996 HS senior cohort			1997-1998 HS senior cohort			1999-2000 HS senior cohort			**Diff-in-diffs (9) – (3)**
	Not FMS eligible (1)	FMS eligible (2)	Difference (2) – (1) (3)	Not FMS eligible (4)	FMS eligible (5)	Difference (5) – (4) (6)	Not FMS eligible (7)	FMS eligible (8)	Difference (8) – (7) (9)	**(10)**
Immediate enrollment at a four-year inst.	0.42	0.59	0.18	0.46	0.61	0.15	0.42	0.62	0.20	**0.02**
Credits accumulated after two years	28.41	29.78	1.37	30.69	31.85	1.16	32.01	33.02	1.01	**-0.36**
BA/BS within six years	0.39	0.47	0.08	0.41	0.48	0.07	0.36	0.47	0.11	**0.03**
N	735	1,848	--	1,086	2,886	--	1,277	2,786	--	**--**

Panel 2: BFS-FAS eligible vs. BFS-FMS eligible (Eligible for a 100 percent scholarship vs. eligible for a 75 percent scholarship)

	1995-1996 HS senior cohort			1997-1998 HS senior cohort			1999-2000 HS senior cohort			**Diff-in-diffs (9) – (3)**
	FMS eligible; not FAS elig. (1)	FAS eligible (2)	Difference (2) – (1) (3)	FMS eligible; not FAS elig. (4)	FAS eligible (5)	Difference (5) – (4) (6)	FMS eligible; not FAS elig. (7)	FAS eligible (8)	Difference (8) – (7) (9)	**(10)**
Immediate enrollment at a four-year inst.	0.61	0.53	-0.08	0.65	0.61	-0.04	0.67	0.64	-0.03	**0.05**
Credits accumulated after two years	32.01	23.61	-8.40	35.49	29.45	-6.04	36.85	32.57	-4.28	**4.12**
BA/BS within six years	0.59	0.48	-0.11	0.64	0.56	-0.08	0.63	0.61	-0.02	**0.09**
N	2,422	1,120	--	4,116	1,913	--	4,271	1,988	--	**--**

Notes: In Panel 1 I condition on students who met the high school GPA and academic credit requirements for BFS-FMS eligibility but not BFS-FAS eligibility (i.e. they completed at least 15 credits and had GPAs of 3.0 – 3.49). BFS – FMS-eligible students were those who, in addition to fulfilling these requirements, met the composite SAT benchmark for BFS - FMS eligibility but not BFS-FAS eligibility (i.e. a composite SAT score between 970 and 1260, or its ACT equivalent). In Panel 2 I condition on students who met the high school GPA and academic credit requirements for BFS-FAS eligibility (i.e. they completed at least 15 credits and had GPAs of 3.5 or higher). BFS – FAS-eligible students were those who, in addition to fulfilling these requirements, met the composite SAT benchmark for BFS - FAS eligibility (i.e. they had composite SAT scores of 1270 or higher, or its ACT equivalent). BFS – FAS-ineligible students in Panel 2 were still eligible for a BFS-FMS Scholarship.

Table 4: The effect of Bright Futures-FMS eligibility on college enrollment, choice, persistence, and credit accumulation

	Enrollment after high school				Continuous enrollment		Credits Accumulated		
	Any public college	Initially at a four-year public inst.	Initially at a two-year public inst.	Initially at a private institution	…Through 1st year	...Into 2nd year	…After 2 years	…After 3 years	…After 4 years
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
BFS – FMS eligible	0.01	0.15***	-0.14***	0.01	0.02	-0.00	0.71	1.09	1.43
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.74)	(1.10)	(1.46)
1997-1998 HS senior cohort	0.04*	0.05**	-0.01	0.00	0.04*	0.04*	2.51***	3.72***	5.13***
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.79)	(1.12)	(1.45)
1999-2000 HS senior cohort	0.02	-0.00	0.02	0.01	0.02	0.01	3.82***	5.30***	6.45***
	(0.02)	(0.03)	(0.02)	(0.01)	(0.02)	(0.02)	(0.85)	(1.23)	(1.60)
FMS eligible x 9798 cohort	-0.01	-0.03	0.02	-0.00	-0.02	-0.01	-0.32	-0.42	-0.59
	(0.02)	(0.03)	(0.03)	(0.01)	(0.02)	(0.03)	(0.91)	(1.35)	(1.77)
FMS eligible x 9900 cohort	0.01	0.03	-0.02	-0.00	0.00	0.02	-0.49	0.12	0.87
	(0.02)	(0.03)	(0.03)	(0.01)	(0.02)	(0.03)	(0.96)	(1.43)	(1.90)
High School fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Academic covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographic covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	10,618	10,618	10,618	10,618	10,618	10,618	10,618	10,618	10,618
R^2	0.05	0.14	0.17	0.03	0.05	0.05	0.07	0.08	0.08
Outcome mean for FMS-elig. students in 95/96 cohort	0.80	0.59	0.21	0.04	0.77	0.71	29.78	42.93	55.29

*** p<0.01 ** p<0.05 * p<0.10

Notes: Robust standard errors, clustered at the high school level, are shown in parentheses. The BFS - FMS analytic sample is comprised of students who met the high school GPA and academic credit requirements for BFS-FMS eligibility. BFS - FMS eligible students are those who, in addition to fulfilling these requirements, met the composite SAT benchmark for BFS - FMS eligibility. The reference category for BFS - FMS eligible is comprised of seniors in the 1995-1996 cohort who did not meet the SAT benchmark for BFS - FMS eligibility. I infer whether students enrolled at a private college or university in Florida based on whether they received the non-need-based Florida Resident Assistance Grant, awarded to students who attend in-state private institutions. Academic covariates include cumulative weighted high school GPA and cumulative core academic credits completed. Demographic covariates include race/ethnicity, gender, and free/reduced price lunch status. A constant is also included in the models.

Table 5: The effect of Bright Futures-FAS eligibility on college enrollment, choice, persistence, and credit accumulation

	Enrollment after high school				Continuous enrollment		Credits Accumulated		
	Any public college	Initially at a four-year public inst.	Initially at a two-year public inst.	Initially at a private institution	…Through 1st year	...Into 2nd year	…After 2 years	…After 3 years	…After 4 years
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
BFS-FAS eligible	-0.14***	-0.06***	-0.08***	-0.01	-0.15***	-0.15***	-10.76***	-7.37***	-14.69***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(1.21)	(0.84)	(1.55)
1997-1998 HS senior cohort	0.03***	0.03**	0.00	-0.00	0.04***	0.04***	4.95***	3.40***	6.34***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.71)	(0.51)	(0.90)
1999-2000 HS senior cohort	0.06***	0.07***	-0.01	-0.01	0.06***	0.06***	7.86***	5.13***	10.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.76)	(0.54)	(0.98)
FAS eligible x 9798 cohort	0.05**	0.05*	0.01	0.00	0.05**	0.04*	3.73**	2.87***	4.95***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(1.47)	(1.02)	(1.87)
FAS eligible x 9900 cohort	0.08***	0.06***	0.02*	0.00	0.09***	0.09***	6.68***	4.88***	9.05***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(1.34)	(0.92)	(1.75)
High school fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Academic covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographic covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	15,830	15,830	15,830	15,830	15,830	15,830	15,830	15,830	15,830
R^2	0.09	0.07	0.15	0.04	0.08	0.08	0.08	0.08	0.08
Outcome mean for FAS-elig. students in 95/96 cohort	0.57	0.53	0.04	0.06	0.55	0.53	23.61	35.47	45.55

*** p<0.01 ** p<0.05 * p<0.10

Notes: Robust standard errors, clustered at the high school level, are shown in parentheses. The BFS - FAS analytic sample is comprised of students who met the high school GPA and core academic credit requirements for BFS-FAS eligibility. BFS - FAS eligible students are those who, in addition to fulfilling these requirements, met the composite SAT benchmark for BFS - FAS eligibility. The reference category for BFS - FAS eligible is comprised of seniors in the 1995-1996 cohort who did not meet the SAT benchmark for BFS - FAS eligibility. I infer whether students enrolled at a private college or university in Florida based on whether they received the non-need-based Florida Resident Assistance Grant, awarded to students who attend in-state private institutions. Academic covariates include cumulative weighted high school GPA and cumulative core academic credits completed. Demographic covariates include race/ethnicity, gender, and free/reduced price lunch status. A constant is also included in all the models.

Table 6: The effect of Bright Futures-FMS eligibility on whether students earned a degree at a Florida public college or university

	Earned an associate's Degree in:			Earned a bachelor's Degree in:			
	3 years	4 years	5 years	4 years	5 years	6 years	7 years
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
BF-FMS eligible	-0.05***	-0.06***	-0.07***	0.04**	0.04*	0.05**	0.07***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
1997-1998 HS senior cohort	-0.02	0.01	-0.00	0.00	0.01	0.03	0.06***
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)
1999-2000 HS senior cohort	-0.02	-0.00	0.01	-0.03*	-0.04*	-0.03	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
BF-FMS x 9798 cohort	0.00	-0.02	-0.01	-0.02	-0.01	-0.02	-0.04
	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)
BF-FMS x 9900 cohort	0.01	-0.01	-0.01	0.00	0.03	0.03	-0.01
	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)
High school fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Academic covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographic covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	10,618	10,618	10,618	10,618	10,618	10,618	10,618
R^2	0.08	0.08	0.09	0.08	0.09	0.08	0.08
Outcome mean for FMS-elig. students in 95/96 cohort	0.17	0.23	0.25	0.17	0.38	0.47	0.52

*** p<0.01 ** p<0.05 * p<0.10

Notes: Robust standard errors, clustered at the high school level, are shown in parentheses. The BFS - FMS analytic sample is comprised of students who met the high school GPA and core academic credit requirements for BFS-FMS eligibility. BFS - FMS eligible students are those who, in addition to fulfilling these requirements, met the composite SAT benchmark for BFS - FMS eligibility. The reference category for BFS - FMS eligible is comprised of seniors in the 1995-1996 cohort who did not meet the SAT benchmark for BFS - FMS eligibility. Academic covariates include cumulative weighted high school GPA and cumulative core academic credits completed. Demographic covariates include race/ethnicity, gender, and free/reduced price lunch status. A constant is also included in all the models.

Table 7: The effect of Bright Futures-FAS eligibility on whether students earned a degree at a Florida public college or university

	Earned an associate's Degree in:			Earned a bachelor's Degree in:			
	3 years	4 years	5 years	4 years	5 years	6 years	7 years
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
BF-FAS eligible	-0.07***	-0.08***	-0.07***	-0.05***	-0.12***	-0.14***	-0.14***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
1997-1998 HS senior cohort	-0.02**	-0.02	-0.01	0.01	0.03**	0.04***	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
1999-2000 HS senior cohort	-0.03**	-0.02	-0.01	0.00	0.03**	0.04***	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
BF-FAS x 9798 cohort	-0.00	-0.01	-0.02	0.01	0.03	0.04*	0.05**
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
BF-FAS x 9900 cohort	0.02	0.01	0.01	0.07***	0.10***	0.10***	0.10***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
High school fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Academic covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographic covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	15,830	15,830	15,830	15,830	15,830	15,830	15,830
R^2	0.11	0.11	0.11	0.07	0.06	0.06	0.05
Outcome mean for FAS-elig. students in 95/96 cohort	0.08	0.10	0.11	0.29	0.44	0.48	0.49

*** p<0.01 ** p<0.05 * p<0.10

Notes: Robust standard errors, clustered at the high school level, are shown in parentheses. The BFS - FAS analytic sample is comprised of students who met the high school GPA and core academic credit requirements for BFS-FAS eligibility. BFS - FAS eligible students are those who, in addition to fulfilling these requirements, met the composite SAT benchmark for BFS - FAS eligibility. The reference category for BFS - FAS eligible is comprised of seniors in the 1995-1996 cohort who did not meet the SAT benchmark for BFS - FAS eligibility. Academic covariates include cumulative weighted high school GPA and cumulative core academic credits completed. Demographic covariates include race/ethnicity, gender, and free/reduced price lunch status. A constant is also included in all the models.

Table 8: Heterogeneous effects of BFS-FAS eligibility on initial enrollment and degree attainment within seven years of HS

	Initial Enrollment	BA/BS within 7 yrs	Initial Enrollment	BA/BS within 7 yrs	Initial Enrollment	BA/BS within 7 yrs
	(1)	(2)	(3)	(4)	(5)	(6)
BFS-FAS eligible	-0.15***	-0.15***	0.45**	0.50*	-0.15***	-0.15***
	(0.02)	(0.02)	(0.23)	(0.27)	(0.02)	(0.02)
1997-1998 cohort	0.03***	0.04***	-0.12	-0.07	0.03**	0.03**
	(0.01)	(0.01)	(0.16)	(0.18)	(0.01)	(0.01)
1999-2000 cohort	0.06***	0.04***	-0.12	-0.25	0.06***	0.05***
	(0.01)	(0.01)	(0.16)	(0.17)	(0.01)	(0.01)
FAS x 9798 cohort	0.05**	0.05**	0.25	0.18	0.06**	0.06**
	(0.02)	(0.02)	(0.30)	(0.35)	(0.03)	(0.02)
FAS x 9900 cohort	0.09***	0.11***	0.37	0.64*	0.09***	0.10***
	(0.02)	(0.02)	(0.28)	(0.34)	(0.02)	(0.02)
FRL x FAS x 9798	-0.01	-0.11				
	(0.12)	(0.14)				
FRL x FAS x 9900	-0.12	-0.26**				
	(0.12)	(0.13)				
GPA x FAS x 9798			-0.05	-0.03		
			(0.07)	(0.09)		
GPA x FAS x 9900			-0.07	-0.13		
			(0.07)	(0.09)		
NORTH x FAS x 9798					-0.09	-0.06
					(0.06)	(0.06)
NORTH x FAS x 9900					-0.02	0.02
					(0.05)	(0.05)
High school fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Academic covariates	Yes	Yes	Yes	Yes	Yes	Yes
Demographic covariates	Yes	Yes	Yes	Yes	Yes	Yes
N	15,830	15,830	15,830	15,830	15,830	15,830
R^2	0.09	0.06	0.09	0.06	0.09	0.05
p-value on joint test of 3-way interactions	0.479	0.110	0.596	0.187	0.224	0.437

*** p<0.01 ** p<0.05 * p<0.10

Notes: Robust standard errors, clustered at the high school level, are shown in parentheses. The BFS - FAS analytic sample is comprised of students who met the high school GPA and core academic credit requirements for BFS-FAS eligibility. BFS - FAS eligible students are those who, in addition to fulfilling these requirements, met the composite SAT benchmark for BFS - FAS eligibility. The reference category for BFS - FAS eligible is comprised of seniors in the 1995-1996 cohort who did not meet the SAT benchmark for BFS - FAS eligibility. FRL refers to whether students qualified for free-or reduced price lunch. NORTH refers to whether students lived in one of the two northern regions of the state. Academic covariates include cumulative weighted high school GPA and cumulative core academic credits completed. Demographic covariates include race/ethnicity, gender, and free/reduced price lunch status. A constant is also included in all the models. Each model includes the requisite two-way interactions between each characteristic, BFS-FAS eligibility, and/or cohort.